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Intellectual Property Rights in Preferential Trade Agreements: Mapping the Content, Analysing the Design, Studying the Effects

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Abstract

This doctoral thesis discusses the theory behind IPRs in PTAs and finds that there exist ambiguous rationales. Whilst some argue for more stringent regulation of IPRs through PTAs, others oppose it. Both rationales are based on the assumption that their approach is most beneficial for a countries' economy, growth and welfare. To test which rationales prevail beyond the theoretical debate, this thesis follows three research questions: what countries do, why they do it and if their decisions matter. Therefore, I map the content of IPRs in PTAs, analyses their design and its variations, as well as study their effects.

To map the content of IPRs in PTAs, I compiled a systematic and comprehensive dataset on IPRs in PTAs, that covers 86 IPR variables for 724 PTAs. Additionally, I created a T+PTA dataset in collaboration with Morin (Morin and Surbeck 2019), which includes 90 variables on TRIPS-plus provisions in PTAs. The datasets allow mapping the IPR content of PTAs across time and regions. The descriptive statistics demonstrate that there are different strategies when it comes to regulating IPRs through PTAs. While some countries seem to have a consistent strategy, others show an immense variation of IPRs depending on the PTA. In order to better understand why there is such variation intra- and inter-countries, I focus on the design of IPRs in PTAs.

For the analysis of the design of IPRs in PTAs, I look at the explanatory factors of economic power asymmetry, domestic interests, political pressure, veto players, endogeneity effect of PTAs, regime preference, and path dependency. I find that all of the explanatory factors have a significant effect on the IPR design, yet the most distinct effect can be observed for economic power asymmetry and domestic interests. The direction of the relationship varies depending on the design feature. This suggests that countries act based on their interest and apply the rationale of IPRs only selectively.

Furthermore, I examine if the design of IPRs in PTAs matters and leads to observable effects. The effects are analysed by looking at the legal-institutional effects as well as the economic effects. For the analysis of the legal-institutional effects, I look at the effect that precision and delegation have on implementation, compliance and effectiveness. The analysis shows that the effect of the IPR multilateral coherence commitments in PTAs operationalised through precision and delegation have a marginal negative effect on the implementation of the PTA, and significantly positive effects for both the compliance, as well as effectiveness. The design of IPRs in PTAs thus impacts the domestic accession to IPR multilateral agreements.

The economic effects analysis explores if the design of IPRs in PTAs matters. To this end, I focus on five factors derived from the rationale of IPRs, namely investment in R&D, FDI and licensing, innovation, technology transfer, and growth. Theory suggests a positive effect of IPRs on these factors, yet the regression analysis shows that the effects are predominately significantly negative, especially for stringent IPR provisions. The only consistently positive effects can be observed for TRIPS-plus enforcement provisions on the investment in R&D and specific IPR provisions on technology transfer. For the most commonly analysed factor FDI, my analysis shows no significant effects. As previous research has shown that the effects of IPRs vary according to the development level of countries, I additionally check the results of the economic effects for low-income, lower-middle-income, upper-middle-income and high-income countries. Hereby, the results show some variation according to the development level of countries, yet no clear division across income levels. However, the number of significant results suggest that high-income countries are affected the most by IPRs in PTAs.

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This dissertation aims to offer a comprehensive analysis of intellectual property rights (IPRs) in preferential trade agreements (PTAs). At the core of this doctoral thesis lies the dataset on the analysis of IPRs in PTAs from a political science perspective, enriched by the interdisciplinary environment that my home institution, the World Trade Institute, offers.

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List of Abbreviations

ACTA	Anti-Counterfeiting Trade Agreement
AIC	Akaike Information Criterion
Art.	Article
ASEAN	Association of Southeast Asian Nations
BIC	Bayesian Information Criterion
BIT	Bilateral Investment Treaty
BoP	Balance of Payments (current account balance)
BRIC	Brazil-Russia-India-China
CAFTA	Central America Free Trade Agreement between Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and the United States
CAFTA-DR	Accession of the Dominican Republic to the CAFTA
CBD	Convention on Biological Diversity
ccTLDs	country code Top-Level Domains
CEFTA	Central European Free Trade Agreement
CEPII	Centre d'Études Prospectives et d'Informations Internationales
CETA	Comprehensive Economic and Trade Agreement
cont.	continued
CPTPP	Comprehensive and Progressive Agreement for TPP
DAC	Development Assistance Committee, OECD
DESTA	Design of Trade Agreements
df	delta to the time of the entry into force of the PTA
df10l	delta to the time of the entry into force of the PTA plus a ten-year-lag
df3l	delta to the time of the entry into force of the PTA plus a three-year-lag
df5l	delta to the time of the entry into force of the PTA plus a five-year-lag
dft	delta to the time of the entry into force of the PTA plus the IPR transition period
di	domestic interests
Dr	Doctor
DR	Dominican Republic
DS	Dispute Settlement
DSM	Dispute Settlement Mechanism
e.g.	for example
EC	European Community
Ed.	Editor
Eds.	Editors
EEA	European Economic Area
EFTA	European Free Trade Association of Iceland, Liechtenstein, Norway and Switzerland
EPA	Economic Partnership Agreement
epa	economic power asymmetry

EPC	European Patent Convention
et al.	and others
et seqq.	et sequentes
etc.	et cetera
EU	European Union
FC	First-comer (IPR measure)
FDI	Foreign Direct Investment
G-20	Global-20
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs in Trade
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GDPpc	Gross Domestic Product per capita
GIs	Geographical Indications
GPE	Global Political Economy (alias International Political Economy IPE)
GSP	Generalised System of Preferences
gTLDs	generic Top-Level Domains
HIC	High-income countries
HNB	Hurdle model with a negative binomial distribution for the count data
HP	Hurdle model with a Poisson distribution for the count data
htp	High-technology products
i.e.	id est (that is; meaning)
ICTs	Information and Communication Technologies
incl.	including
IPPC	International Plant Protection Convention
IPRI	International Property Rights Index
IPRs	Intellectual Property Rights
ISIC	International Standard Industrial Classification of all economic activities
LDC	Least-Developed Country
LIC	Low-income countries
LMIC	Lower-middle income countries
ln	logarithmic value (alias log)
log	logarithmic value (alias ln)
ltp	Low-technology products
MERCOSUR	Southern Common Market
MFN	Most-favoured-nation
mhtp	Medium-high-technology products
mltp	Medium-low-technology products
n.e.c.	not elsewhere classified
NA	not available
NAFTA	North American Free Trade Agreement
NB	Negative Binomial Regression
NCCR	National Centre for Competence in Research
NN	North-North PTAs (see *3.1.1 Selection of Preferential Trade Agreements*)

NS	North-South PTAs (see *3.1.1 Selection of Preferential Trade Agreements*)
NT	National Treatment
NTBs	Non-Tariff Barriers
NTMs	Non-Tariff Measures
O	Overall (IPR measure)
OECD	Organisation for Economic Cooperation and Development
OLS	Ordinary Least Squares
OP	Ordered Probit Regression
P	Poisson Regression
PCT	Patent Cooperation Treaty
pd	Path dependency of own PTAs (pdg: general provisions; pds: specific provisions; pdtp: TRIPS-plus provisions)
pdw	Path dependency of PTAs worldwide
pdw f	Path dependency of PTAs worldwide, year of entry into force of the PTA (pdwfs: specific provisions; pdwftp: TRIPS-plus provisions)
pdw s	Path dependency of PTAs worldwide, year of PTA signature (pdwss: specific provisions; pdwstp: TRIPS-plus provisions)
PhD	Doctor of Philosophy
PLT	Patent Law Treaty
Prof.	Professor
PTA	Preferential Trade Agreement
R&D	Research and Development
resp.	respectively
RTA	Regional Trade Agreement
SS	South-South PTAs (see *3.1.1 Selection of Preferential Trade Agreements*)
TK & GR	Traditional Knowledge and Genetic Resources
TLT	Trademark Law Treaty
TPP	Trans-Pacific Partnership
TRIPS	Agreement on Trade-Related Aspects of Intellectual Property Rights
TTIP	Transatlantic Trade and Investment Partnership
UAE	United Arab Emirates
UCC Geneva	Universal Copyright Convention Geneva
UCC Paris	Universal Copyright Convention Paris
UDRP	Uniform Domain-Name Dispute-Resolution Policy
UMIC	Upper-middle income countries
UNCTAD	United Nations Conference on Trade and Development
UPOV	International Convention for the Protection of New Varieties of Plants
USA	United States of America
USTR	Office of the United States Trade Representatives
VIF	Variance Inflation Factor
WCT	WIPO Copyright Treaty
WIPO	World Intellectual Property Organization
WITS	World Integrated Trade Solutions (World Bank database)
WPPT	WIPO Performances and Phonograms Treaty

WTI	World Trade Institute (University of Bern)
WTO	World Trade Organization
ZI	Zero-inflated model
ZINB	ZI model with a negative binomial distribution for the count data
ZIP	ZI model with a Poisson distribution for the count data

Chapter 1: Introduction

The connection between trade agreements and intellectual property rights (IPRs) is relatively new. For centuries, trade agreements focused mainly on tariffs and other direct forms of trade regulation, and only in the last century, trade agreements began to include other trade-related elements. Trading partners became aware that tariffs might be the most visible and direct trade regulation instrument, yet for a successful trade regime, there are also other relevant factors that are worth considering. For example, the regulation of the access to a market, the settlement of disputes, the regulation of investments or services, and newer areas such as labour, environment or intellectual property rights. To ensure an optimal regulation of trade, it is beneficial if other aspects besides tariffs are included and enforceability measures are established to make sure that trading partners adhere to commitments in their trade agreements. Furthermore, the spread and segmentation of supply chains mean that many products are not produced in one country and exported as a final product into another one. Instead, a single product is designed, produced, assembled, marketed, and sold in multiple locations, making an efficient trading system between countries evermore crucial. With this increasing globalisation of supply chains, those new elements of trade agreements became far more important to guarantee an efficient and effective trade regulation regime. By including a trade-related provision such as intellectual property rights in trade agreements, countries can protect their interests more broadly than import and export tariffs. Newer trade agreements, therefore, try to encompass more than just the classic parts of trade regulations and aim to harmonise trade regulations. One leverage point to reduce less obvious trade restrictions are the so-called non-tariff barriers (NTBs) to trade or more generally non-tariff measures (NTMs). NTMs can take many forms, and one of them is intellectual property rights, which are the focal point of this study. So why is it important to take a closer look at NTMs and especially IPRs in trade agreements?

One prominent agreement trying to tackle NTMs was the Transatlantic Trade and Investment Partnership (TTIP) between the United States of America (US) and the European Union (EU). Even though both trading partners might seem similarly developed and culturally aligned there are many differences in their way of regulating trade and trade-related areas. To illustrate the issue of NTMs more clearly, the car industry serves as a good example as the EU and US differ in a substantial number of their regulations for cars. For example, in the area of car safety regulations, there is considerable variation, and minor things such as car side mirrors are regulated differently. In Europe, side mirrors have different optical properties than in the US, and side mirrors in the US require the etched text *“Objects in mirror are closer than they appear”* (see Verband der Automobilindustrie 2015). These are tiny variations in regulations, but in sum, for one product or an entire industry, the adaption to those differences in regulations lead to substantial additional cost.

For IPRs in particular, the key issue is that IPRs are territorial-based, meaning that every country has slightly up to massively different regulation on intellectual property. Besides the costs for producers to get acquainted with the highly-specialised IPR law of each possible trading country, the adaption to these regulations is cost-intensive. For instance, a company would like to export a pharmaceutical. Before exporting it, the pharmaceutical company provided test data that has been gathered over approximately three to five years in clinical trials to provide proof of the pharmaceuticals effectiveness and in turn to gain domestic market access. Depending on the foreign market, the pharmaceutical might be allowed to the market abroad based on this test data acquired in the domestic market (acceptance of foreign test data). However, more commonly the pharmaceutical company will have to run another test data study in the market abroad the get market access for this specific market. This means another couple of years to provide the test data for the market access broad for the same pharmaceutical already tested domestically over years. Besides theses time and finance barriers to exporting pharmaceuticals, there are additional hurdles such as regulatory delays after applying for marketing approval stretching over several years and the legal and political expertise required (Donnelly and Manifold 2011). Moreover, the barriers to trade for pharmaceuticals are often not a burden to the company alone but shared with the market abroad through higher prices of the pharmaceutical. The negative economic effects are thus shared between domestic and foreign markets, and both could gain from reducing such NTMs. According to Francois et al. (2015), the reduction of NTMs would have accounted for 80% of the total gains of TTIP, as their harmonisation decreases the costs of double regulation, administrative expenses and bureaucracy. As tariffs are already on an all-time low level, the impact of reducing the cost of NTMs becomes more and more critical (World Trade Organization 2012, 37).

Trade agreements play a key role in reducing such NTMs and harmonising trade regulations. The number of preferential trade agreements (PTAs; for a more detailed description of the term see *2.1.1 Preferential Trade Agreements (PTAs)*) has steadily risen over the last decades, and most recent PTAs include regulations of NTMs in some form or another. One NTM that has been often discussed in relation to trade are intellectual property rights. Ever since the establishment of the agreement on Trade-Related Intellectual Property (TRIPS) during the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) in 1994, there has been a debate on how to best regulate IPRs and to what degree this should be done via trade agreements. The World Trade Report 2012 (World Trade Organization 2012, 112–13) lists intellectual property rights under the top five problem reported by US exporters and EU firms, and states that IPRs pose at least a "procedural obstacle" for all firms participating in the ICT business survey (World Trade Organization 2012, 120). Regulating IPRs through trade agreements could have already become the way of mapping the content of regulation, which leads me to the research gap and relevance of this study.

1.1 Research Gap

The key issue in analysing IPRs in PTAs so far is that there is no data mapping the intellectual property content of trade agreements in a comprehensive manner. This means that there is no clear picture of how IPRs are regulated through PTAs and the previous analysis shows mostly fragments of the international development. The main theories are thus mostly based on case studies and might not reflect a generalisable approach to explain IPRs in PTAs, and it was impossible to create a comprehensive content analysis and effect analysis of IPRs in PTAs.

There are small-scale approaches such as case studies or in-depth analyses yet no extensive data that allows an overview as well as a comparison across countries. For example, there are plenty of studies focusing in detail on one specific agreement, researching a specific IPR area such as patents or analysing all trade agreements and their IPR content of a specific country such as the US or a region such as South Asia. However, there are very few datasets comprehensively collecting the IPR content of PTAs. Most databases are selective either on the IPR content by being restricted to certain IPR areas such as patents, copyrights, and trademarks, or they only cover a limited amount of trade agreements by looking either at single agreements, countries, or regions. This makes general assumptions and comparisons more difficult.

This data gap might be due to the fact that the topic of intellectual property rights in trade agreements predominately has been analysed by legal and economic scholars. In discussion with peers from different disciplines, I often encountered two strands of thought: either that a comprehensive dataset on IPRs in PTAs will be too detailed or not detailed enough. The latter I have encountered whilst debating with legal scholars. Their main concern with a comprehensive dataset on IPRs in PTAs was that a binary codebook could not reflect the nuances in the legal language. The legal framework tends to be detailed as their core element of analysis is the legal language of a PTA. This, in turn, means that it is hard to create a scheme where for example different PTAs can be compared to one another, and if such a framework is created legal scholars aware of the refined distinctions and their legal consequences are reluctant to convert this into a binary code due to the loss of information. A "shall adhere to" can have a fundamentally different meaning than a "make every possible effort to", which is hard to reflect in binary terms.

The feedback from economic scholars was not that it is unfeasible to create a dataset on IPRs, but rather than the cost of creating a more detailed dataset far outweighs its benefits. To code agreements is time-intensive and in the area of IPR calls for legal advice and expertise, which makes it a long-term project. As economic analysis often works with models and variables that are hard to measure or where there is a lack of data, it is common to use proxies for such cases as IPR in PTAs. The approach for analysing the effects of IPRs in PTAs has thus been for example to approximate IPRs in PTAs by using the existence of an IPR chapter within an agreement or taking one specific IPR area such as patent in a PTA as a proxy for IPR in general. This would serve as a valid proxy to analyse the effects of IPRs in PTAs.

The issue with those two arguments is that they make a comprehensive analysis of the design and its effect unlikely. Without a detailed coding of IPRs in PTAs, it is impossible for countries and policymakers to know what other countries are agreeing to in PTAs. Beyond the depth of legal language, the terminology of IPRs in PTAs can serve as a common denominator that makes IPRs in PTAs comparable. For example, it is very clear if a PTA protects patents or not, and if there are more specific provisions such as a specific duration of patent protection. Even though such coding lacks the bindingness of said provisions, it makes PTAs comparable on a minimum legal level. Moreover, such coding is far more informative than the binary coding of IPRs being in the PTA or not. This, of course, would be important when negotiating PTAs, looking for best-practices and learning from PTA design. So far, the design can only be compared on a small case basis, and the effects cannot be traced back to specific IPR provisions. By coding the IPR content in more detail, countries preferences for specific IPR areas can be visualised such as if there is a strong preference for protecting copyrights and if this preference for copyrights is included consistently across all its PTAs.

A key hurdle to overcome when creating a dataset on IPRs in trade agreements was thus to find a balance between the two points of argument to ensure that the data will be relevant to a broader research community. In this manner, this study aims to create a data collection scheme that fits all trade agreements and allows a reflection of their actual content on IPR. A dataset that can be used to analyse and compare IPR policies made through trade agreements and be the basis for effects analysis. Moreover, this dataset should prove to be a valuable asset for different disciplines besides political science such as economics and law.

A comprehensive dataset on IPRs in PTAs is thus the first step for analysing the status quo. Only then can the reasons behind the design of IPRs in PTAs as well as their effects be taken into account. So far, there has been mostly theoretical research on why countries choose certain design variations of IPRs in PTAs and if at all only cases studies on the effects such IPR provisions in PTAs have, for instance on FDI and innovation. By providing the foundation through creating a comprehensive dataset on IPRs in PTAs and conducting analyses on both the design as well as the effects of IPRs in PTAs, my research can thus highlight the state of play, the reasoning behind the variations in the design as well as if the variations have any legal or economic effects.

1.2 Relevance

The dataset on IPRs in PTAs and its study is relevant in various regards. Foremost, the dataset gives an overview of the IPR content regulated in PTAs, and the study on the dataset shows how the data can be understood and used to explain the design of IPRs in PTAs, and the effects of IPR provisions beyond PTAs. This can thirdly assist in testing the theoretical assumptions behind including IPRs in PTAs and ultimately the effect of IPRs.

Both trade agreements, as well as intellectual property rights, are nowadays more debated than they have been in the past few decades. Recent developments put trade agreements back on the forefront of political discussion, and political actors have discovered trade agreements as a topic to unify voters for a common cause. The political spectrum from left to right has shown an increased interest in trade agreements and their content and possible impacts. From the Greenpeace-leak of the TTIP and the implied the negative impacts feared out of entering TTIP, to the current American President, Donald Trump, listing two preferential trade agreements as top priorities in his 100-day action plan: The North American Free Trade Agreement (NAFTA) and the Trans-Pacific Partnership (TPP). In his plan, Trump stated to renegotiate or withdraw from NAFTA, and his intention to withdraw from TPP, because they are "bad deals" (see Trump 2016). Multilateral agreements such as TPP, TTIP or the Comprehensive Economic Trade Agreement (CETA) have also been in the news because of resistance of civil society and specific stakeholders against specific terms in those agreements. So, when the US withdrew from TPP, the remaining countries decided to keep the treaty under the new name Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), and it entered into force after some amendments were made. Some of the fundamental changes from TPP to CPTPP were in the chapter on intellectual property rights, where many of the stringent IPR provisions were dropped after the US pulled out of the agreement. This brings back arguments raised after TRIPS entered into force: do IPRs belong in preferential trade agreements? And if so, should they lead to more stringent protection of IPR? Or would it be better not to define IPRs through trade agreements, but use PTAs to set some ground rules, guarantee specific freedom rights and grant exceptions? After all, is it not true that IPRs protect mostly the interests and inventions of Western IPR producing economies such as the US?

> *"Intellectual property is an important legal and cultural issue. Society as a whole has complex issues to face here: private ownership vs. open source, and so on."*
> Tim Berners-Lee, inventor of the World Wide Web (Knuth et al. 2011, 44)

For a society facing the issue of how to regulate IPRs in an efficient manner, there is a need for more information on the current status of IPR regulation through PTAs. So far, the research on intellectual property rights in trade agreements has been widely left to legal scholars and economists. However, the topic of IPRs should be more intensively discussed in social science and political science specifically. The protection of intellectual property rights has broad social implications that target for example consumers in their everyday life such as in the regulation by downloading music, bringing back trademarked souvenirs from their holidays or the purchasability of genetically modified food. The regulation of intellectual property impacts almost every area in some form or another. For example, in the educational system it influences the availability and price of educational material, software and research; for the health system it is crucial for the allowance of generic drugs; in the agricultural sector it decides on the patentability of plants or seed protection; and in the industry, in general, it can give protection via trade secrets, industrial design protection or trademarks. Even so, research in political science has mostly focused on a particular topic in regard to IPRs: the pirate party. The pirate party is a relatively new political party that can be found across the globe, has many different manifestations, but often represents a more deliberate and less regulated approach towards intellectual property rights. By analysing IPRs on a broader scale than the pirate party, social science can assist to give a more balanced view of the benefits and shortcomings of IPRs. This would add a social science and evidence-based perspective to the predominantly existing legal and economic research. By providing a comprehensive database, the scientific community can overcome the disciplinary hurdles and provide more accurate and fine grained analysis of the current situation, developments and impacts of IPRs in PTAs.

In academia, it can be used to further the research on both trade agreements as well as intellectual property rights. For example, legal scholars can use the data to identify interesting cases for in-depth analysis such as outlier cases or use it as a basis for more fine-grained coding of the legal text. The academic findings will also lead to a broader and more informed society. If people should support trade agreements, there should be sufficient and evidence-based information on what PTAs de facto include on intellectual property rights. This study also informs the IPR-consumers about their rights and duties, that their countries agree to and that they, in turn, have in the PTA-member countries. The same is true for IPR-producers, which can use this study to learn more about their rights at home and abroad. Furthermore, the content of IPR in PTAs is relevant for a multitude of actors. Policymakers can use the dataset to learn about the IPR strategy of their own as well as other countries and for example, use the gained knowledge in negotiations or to create an IPR strategy. Overall, it will allow policymakers to make evidence-based decisions and to justify their actions towards their constituency.

The following paragraph briefly describes the structure of this doctoral thesis. *Chapter 2: Theoretical Context of IPRs in PTAs* describes the terminologies, rationales, theoretical debates and previous research of PTAs, IPRs and IPRs in PTAs. This is followed by *Chapter 3: Dataset on Intellectual Property Rights in PTAs* that includes the description of the datasets, the concepts used, a description of the coding approach, followed by descriptive statistics. *Chapter 4: Design of Intellectual Property Rights in PTAs* focuses on the design by first looking at the theory of treaty design, then explaining the data and analysis. *Chapter 5: Effects of Intellectual Property Rights in PTAs* focuses on the legal and economic effects of IPRs in PTAs. *Chapter 6: Overarching Summary and* Conclusion gives an overview of the study and draws some summarising conclusions.

Chapter 2: Theoretical Context of IPRs in PTAs

Before starting to code IPRs in PTAs, it was crucial to understanding the theoretical debates and mechanisms behind trade agreements, intellectual property rights as well as IPRs in PTAs. This chapter details the terminologies and the logic behind these concepts by looking at the economic rationales of IPRs in PTAs. Furthermore, it elaborates on the key theories of global political economy (GPE) that can explain the inclusion of IPRs in PTAs and were considered for the creation of the IPRs in PTAs dataset and its study. Subsequently, the previous research on IPRs in PTAs is described and the overarching research questions portrayed.

2.1 Terminologies

Around the term of trade agreements there still exists a debate on how to categorise them and which label describes their aim and content most precisely. The following sub-chapter will thus first elaborate on the term preferential trade agreements (PTAs) used in this doctoral thesis and distinguish it from other terminologies. Afterwards, the term of intellectual property rights (IPRs) is described in more detail.

2.1.1 Preferential Trade Agreements (PTAs)

Trade regulation describes the legal rules of trading and knows many forms. Trade regulation can be differentiated along the line of the number of countries involved – unilateral, bilateral, multilateral, international – as well as the form of trade legislation. Firstly, trade can be regulated through domestic legislation such as subsidies for own goods or quotas for imported goods, and unilateral actions such as Generalised System of Preferences (GSP; see *2.1.1 Preferential Trade Agreements (PTAs)*), thus countries define their own rules of trade regulation within the domestic sphere and towards other countries. Secondly, countries can enter into trade agreements with one or more partners in order to define reciprocal and or preferential trade rules such as equal or preferential tariffs for goods (see Snorrason 2012). Thirdly, countries can form a free trade area such as NAFTA, in which countries can still decide individual on their external tariffs (beyond the members of the free trade area), but share a common internal tariff. Fourthly, countries can enter a customs union such as the EU or the Southern Africa Customs Union, whereby countries additionally to forming a free trade area also share a common external tariff (see Clausing 2000). Thus, preferential trade agreements represent only one part of trade regulation. However, PTAs are the "*most prominent and important governance instrument of our times for regulating trade and investment flows*" (Dür and Elsig 2015, 1). In the literature on trade agreements, there are numerous terminologies for trade agreements and the understanding of those terms is not homogenous. I will therefore firstly define the three most common terminologies and explain why I use the term preferential trade agreements.

The three most common terms to label trade agreements more specifically are free trade agreements (FTAs), regional trade agreements (RTAs) and preferential trade agreements (PTAs).

Free trade agreement is a term often used for trade agreements with highly liberalising tariff schedules. The "free" in FTA implies a trade regime free from barriers, yet the term FTA is mostly used in connection to tariffs. Thus, trade agreements that lower tariffs or eliminate them substantially are often named FTAs, where the "free" refers to "free from tariffs". The term "free" is inaccurate on one hand because in practice FTAs often lower tariffs, yet do not eliminate them or include at least a short list of products with a tariff. On the other hand, the term "free" can be misleading as it revolves around the understanding that tariffs are the only barriers to trade and by reducing or eliminating tariffs, the trade will be "free". Nevertheless, trade agreements include various other factors that can hinder trade such as quotas, subsidies and other NTMs like intellectual property rights. The term FTA thus instead indicates the aim and market perspective of the corresponding trade agreement than their actual content.

Another term that is widely used is regional trade agreements. As the name suggests, these agreements have a geographical aspect and focus on regional partners. This has been an accurate term for many years as countries mostly traded with their neighbouring countries and partners within the same region (World Trade Organization 2011, 44). But nowadays, countries also enter trade agreements beyond their closer or broader region, e.g. the trade agreements signed between India and Chile (2006), Australia and Japan (2014) or China and Switzerland (2014). The term "regional" would thus either mean excluding many of the more recent trade agreements or be misleading as the trading partners range beyond a regional scope. In their World Trade Report 2011, the World Trade Organization (WTO) adopted the terminology of PTAs rather than RTAs and showed that the term RTA is out-dated as more than half of the PTAs in force at that time were not bound to common WTO regions (World Trade Organization 2011, 58). Before this decision, the WTO had a different definition of PTAs, namely that these are unilateral preferential decisions from one country towards another, so-called Generalised System of Preferences (GSP). This equation of PTAs and GSP is highly uncommon and is not how the term will be applied in this study.

The term preferential trade agreements is *"defined as agreements that liberalize trade between two or more countries but that do not extend this liberalization to all countries (or at least to a majority of countries)"* (Dür and Elsig 2015, 1). As the term states, these trade agreements include preferential provisions among members of the treaty. These PTA members can be from the same or different regions and their approach to eliminate tariffs is secondary as long as they include some form of trade liberalisation. The PTA-terminology has the benefit that it is semantically the closest to the actual content of trade agreements and fits most of the bilateral or multilateral trade agreements with some liberalisation content.

2.1.2 Intellectual Property Rights (IPRs)

"Intellectual property rights" is an umbrella term that refers to many different forms of intangible property and their corresponding rights. In general, IPRs protect creations of the mind, which can take a variety of forms. These forms often have their corresponding protection called IPRs such as copyright for books and patents for inventions. This leads to a broad variety of IPRs on many levels such as their name, duration, character, and purpose. Therefore, the general conception of IPRs needs to be broken down into which rights are included in its definition.

For this doctoral thesis, the focus lies on IPR categories that are most commonly found in PTAs, be it in a general article defining the term IPR or in a specific for example regulating the term of protection. Valdés and Tavengwa (2012) performed the thus far most extensive analysis of IPRs in PTAs and have also identified these eleven forms of IPRs to be relevant for their analysis (see *3.1.2 Variables on Intellectual Property Rights, 3.1.2.2 IPR Scope Variables*). I therefore only focus on the subsequent eleven forms of IPRs: copyrights, trademarks, geographical indications (GIs), industrial design, patents, undisclosed information, layout-designs of integrated circuits, new plant varieties, traditional knowledge and genetic resources (TK & GR), encrypted program-carrying satellites, and domain names. *Table 1: Forms of IPR* briefly describes those eleven forms of IPRs and informs about their duration and purpose of protection (own table based on information of the World Intellectual Property Organization, 2018).

Table 1: Forms of IPR

IPR Form	Example of Manifestations	Duration	Rationale
Copyrights	Protect work of authorship such as books, movies, video games. Often includes "related rights" derived from copyright protection such as performances or broadcasts. Often indicated by the symbol ©.	Often for life of the author plus 50 years after death of author (definite)	Incentive for innovation
Trademarks	Protect designs, signs, and expression such as brand names or logos (e.g. "Coca-Cola"). Often indicated by the symbol ™ or ® for registered trademarks.	Often 10 years, but mostly renewable multiple times (quasi-indefinite)	Overcome information asymmetries
Geographical Indications	Protect names bound to a product (mostly food or handicrafts) of a certain geographical region such as Champagne wines from France. Often indicated by labels such as DOC (e.g. for wine from Italy) or AOP (e.g. for cheese from Switzerland).	Often indefinite. Sometimes limited to 10 years, but mostly renewable multiple times.	Overcome information asymmetries
Industrial Designs	Protect ornamental or aesthetic features that make a product distinguishable such as Lego figures or a Mini Cooper. Also referred to as "design patents".	Often 15 years, i.e. 5 years plus twice a 5-year extension (definite)	Incentive for innovation
Patents	Protect technical inventions resulting in products or processes with functional aspects such as the iPhone, the 3-D printer, the Global Positioning System or Bluetooth. Often require an inventive and novel step.	Often 20 years plus extension (definite)	Incentive for innovation
Undisclosed Information	Protect undisclosed business information such as trade secrets like the formula of a beverage. Also referred to as "confidential information".	Often indefinite	Incentive for innovation
Layout-Designs of Integrated Circuits	Protect layout designs of integrated circuits (chips, microchips) such as silicon chips for electronic equipment like SIM cards. Also referred to as topographies of semi-conductor (silicon) circuits.	Often 10 years (definite)	Incentive for innovation
New Plant Varieties	Protect plant varieties in both their propagating forms such as seeds and their harvested form such as fruit. Often required to be novel, distinct, stable, and uniform. Also referred to as "plant breeder's rights".	Often 20 years, except 25 years for trees and vines (definite)	Incentive for innovation
Traditional Knowledge & Genetic Resources	Protect traditional knowledge such as cultural heritage, skills and practices and genetic resources such as medicinal products or animal breed passed on over generations in local and indigenous communities. TK often includes traditional cultural expressions of folklore (TCEs) such as characteristic signs and symbols.	Often indefinite	Overcome information asymmetries

IPR Form	Example of Manifestations	Duration	Rationale
Encrypted Program-carrying Satellite Signals	Protect program-carrying satellite signals (aural/visual) that are encrypted. Often refers to prohibition of broadcasting without the authorisation of the broadcasting organisation, e.g. news, music, or sports transmission on television.	Often indefinite	Incentive for innovation
Domain Names	Protect internet domain names such as country abbreviations like ".fr", ".me" (ccTLDs), or generic terms such as ".info", ".jobs", ".travel" (gTLDs).	Often indefinite	Overcome information asymmetries

The IPRs listed in *Table 1: Forms of IPR* include those areas of IPRs, which are prominently featured in research such as copyright, patent, trademarks and more recently also traditional knowledge and genetic resources. The other listed forms might not be represented to the same extent in research contributions, yet they are included in PTAs, and it is, therefore, necessary to include them in a systematic dataset on IPRs in PTAs.

The duration of protection varies not only across IPR forms but also among countries. Where some countries grant copyright protection for 50 years after the death of the author, other countries grant 70-90 years of protection after the death of the creators. In *Table 1*, the duration displayed accounts for the most commonly granted protection according to the World Intellectual Property Organization (WIPO) website (World Intellectual Property Organization 2018c).

The purpose of protection is simplified in this table, but generally, the different IPR forms can be categorised based on their purpose: an incentive for innovation or to overcome information asymmetries. To achieve their purpose, different intellectual properties are protected by corresponding IPRs. Those that are intended to give an incentive for innovation are usually definite and granted for a limited period, whereas those IPRs that should overcome an information asymmetry are often granted for an unlimited period or renewable for multiple times making them quasi-indefinite. For example, patents are supposed to give an incentive for creators of IP to produce further innovations. The end result being protected by a patent might be simple to copy if one has the design or reverse engineers the final product. The patent thus gives a limited amount of exclusive protection in turn for disclosed the patented intellectual property such as technology behind an invention after the protection term has ended. The disclosure facilitates the advancement of the intellectual property and spurs future innovation. Whereas, for example, trademarks are protected quasi-indefinite – trademarks can expire if they are not used – and are not protected to increase innovation per se. The protection of trademarks such as Coca Cola helps consumers to easily identify brands and be sure that what they are being is not a counterfeit, maybe even harmful good. Trademark owners are therefore also encouraged to invest in the quality and development of their products as the trademark allows them to differentiate their products from others. The concrete rationale of protecting intellectual property with IPRs is explained in more detail in subchapter *2.2.1.2 Rationale of IPRs*.

2.2 Economic Rationales and Global Political Economy Theories

In the following subchapters, I will discuss the two main theoretical cornerstones that explain why countries include IPRs in PTAs: economic rationales and global political economy theories.

Firstly, I describe the economic rationale by looking at the rationale of PTAs, and subsequently the rationale of IPRs. It is important to differentiate between the two as their intentions might seem diametrically opposite, as PTAs aim to reduce trade barriers and IPRs impose (quasi-)monopolies. Concludingly, I derive the rational of IPRs in PTAs.

Secondly, I draw from the theories of global political economy to explain IPRs in PTAs by looking at the four main theories of *realism*, *liberalism*, *social-constructivism* and *modern marxism*. This theoretical debates are followed by an overview of the previous research on IPRs in PTAs.

2.2.1 Economic Rationales

According to economic rationales, countries act rationally when entering PTAs. The subsequent sections describes the economic rationale behind countries entering PTAs, the economic logic of protecting intellectual property with IPRs, and subsequently, the economic motivations of governments to include IPRs in PTAs.

2.2.1.1 Rationale of PTAs

The surge of trade regulation through preferential trade agreements has led to a broad discussion of why countries enter PTAs and how preferential conditions affect trade. Classical trade theory is founded on the base assumption that countries have to trade on the one hand to satisfy the domestic consumer demand not covered by domestic producers, and on the other hand to provide a market for the supply of domestic producers that go beyond domestic demand. These scenarios are solved by trade, i.e. importing goods (satisfy domestic consumer demand) and exporting them (meet domestic producer supply) (see Myint 1958, 318).

In theory, the optimal trading system has free markets in every country, and there are no barriers to trade. Through opening trade, countries can specialise in areas, where they are most productive, and their quality-price structure is more efficient in established industries. With a liberal market and free trade, products will thus be produced by the countries with the highest comparative advantage, which improves the efficiency of production, lowers prices for consumers and has an overall positive effect on welfare. Centuries ago, David Ricardo and Adam Smith already argued that trade should be free from barriers such as tariffs or otherwise trade will be distorted. Viner (1950) developed these assumptions further and derived that by lifting such trade barriers, trade can either be created or diverted.

In reality, most countries impose barriers to regulate trade due to political, economic or social reasons. For example, to gain votes for political elections, protect agricultural products from cheaper imports or enable infant industries to grow in a protected environment. The most common trade policy instruments are tariffs, export subsidies and import quotas (Krugman, Obstfeld, and Melitz 2012, 241). All of them aim to give domestic producers an additional advantage: Tariffs reflect the imposition of a tariff on an imported good; export subsidies are often payments from the government to a specific exporting firm; import quotas limit the number of imports.

In the following sections, I will display the effects of trade distortion, trade creation and trade diversion on the domestic market in *Figure 1*, *Figure 2* and *Figure 3* to illustrate why countries enter PTAs (based on Krugman, Obstfeld, and Melitz 2012, 226 et seqq.). The figures show the effects on trade of the oldest form of trade policy: tariffs. According to Krugman et al. (2012, 223) tariffs have been a vital revenue factor for countries and serve beside their government income function the goal of protecting specific sectors in the domestic market. Tariffs, unlike export subsidies, are usually applied for the whole market, and unlike import quotas, do not have a threshold on the quantity of imported products. This makes tariffs the most comparable form of trade policy to the effects that IPRs have on trade (for more detail on this argument see *2.2.1.3 Rationale of IPRs in PTAs*).

Figure 1: Trade Distortion and Trade Creation

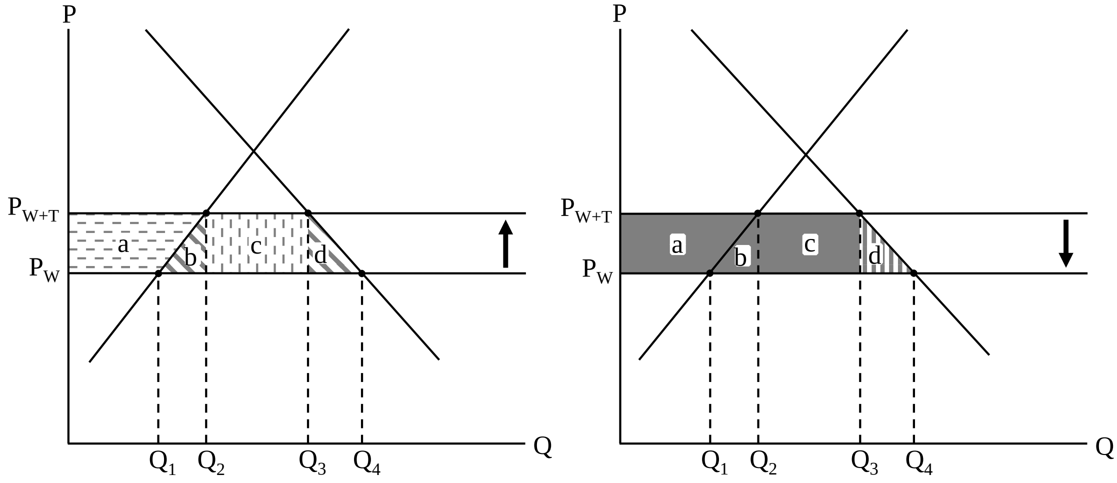


Table 2: Trade Distortion and Trade Creation Effects (Figure 1)

Effects on the Domestic Market	**Trade Distortion** Imposing a Tariff	**Trade Creation** Lifting a Tariff
Consumer Surplus	– (a + b + c + d)	(a + b + c + d)
Producer Surplus	a	– a
Government Revenue	c	– c
Domestic Welfare	– (b + d)	b + d
Domestic Effects	**Negative: – (b + d)**	**Positive: b + d**

On the left-hand side of *Figure 1* and *Table 2: Trade Distortion and Trade Creation Effects (Figure 1)*, the case of trade distortion is illustrated. In the domestic market, a product used to be sold at the world price for a good (P_W). Now, the country decides to impose a tariff (*T*) on said product and therefore increases the price by that tariff (P_W+T). This increase in price means that more domestic producers will be able and willing to supply that product (increase in domestic supplied quantity from Q_1 to Q_2) and less domestic consumers will be able and willing to demand it (decrease in domestic demanded quantity from Q_4 to Q_3). The positive effects for the domestic market are the domestic producer surplus (*a*) and the government revenue through the tariff collection (*c*). However, in comparison to the consumer loss (*–(a+b+c+d)*) the overall effect on domestic welfare is negative (*–(b+d)*), as through the imposition of the tariff both production is distorted (*–b*) and consumption is distorted (*–d*). Accordingly, regulating trade by imposing tariffs results in the distortion of trade (Snorrason 2012).

On the right-hand side of *Figure 1* and *Table 2: Trade Distortion and Trade Creation Effects (Figure 1)*, the matter of trade creation is illustrated. Regarding tariffs, trade creation describes the opposing effect of trade distortion and in theory, is associated with the elimination or at least a reduction of a trade barrier such as a tariff. For example in *Figure 1*, this means that in the domestic market, policymakers decide to eliminate a tariff (T) and the price falls from the price including the imposed tariff (P_W+T) to the world price (P_W). Due to the decrease in the domestic price fewer of the domestic producers will be able and willing to supply this product (decrease in domestic supplied quantity from Q_2 to Q_1), but more domestic consumers will be able and willing to demand it (increase in domestic demanded quantity from Q_3 to Q_4). Here, the positive effect for the domestic market is the consumer surplus ($a+b+c+d$), whereas the negative effects are the loss of domestic producers ($–a$) and the loss of government revenue due to the loss of tariff income ($–c$). The overall effect for the domestic market here is positive ($b+d$), as the elimination of the tariff leads to a creation of production (b) and consumption (d). The deregulation of trade by eliminating the tariff thus creates trade.

Following that logic, the best-case scenario would be for countries to remove all barriers to trade, such as tariffs entirely. The issue with this theory is that all countries would have to abide by it and remove their tariffs, as otherwise, the comparative advantages could not play freely. In such an arbitrary situation, those countries with free markets would be at a disadvantage, as they probably could not profit from their comparative advantage. They would be faced with tariffs upon exporting their goods, be faced with import quotas or export subsidies, whilst allowing others to enter their market without any barriers. Thus, in practice, countries are reluctant to remove tariffs and even more hesitant to eliminate tariffs for all other trading partners. So as countries aim to improve their market situation and know about the negative effect of market barriers, they draw on other options to improve their trading conditions besides eliminating tariffs. In order to liberalise trade without making their markets completely open, countries can act unilaterally, bilaterally or multilaterally.

The multilateral approach was very successful in the last century and in 1948 led to the GATT and General Agreement on Trade and Services (GATS), which in 1994 resulted in the foundation of the WTO. The aim was to reduce trade barriers and harmonise the trading system on a global scale. Some of the key accomplishments are Article 1 of GATT and Article 2 of GATS, that grant members most-favoured-nation treatment (MFN). MFN means that no other country can be treated worse than the country with the most beneficial conditions, i.e. everybody is treated equally to the most-favoured country. These conditions only apply to WTO members and they imply, that every condition agreed to – even after GATT and GATS – has to be granted on a non-preferential basis to other WTO members. If a domestic market thus decides to reduce a tariff, the MFN clause implies that the reduction is not granted preferentially but rather to all WTO members. An example of trade policy derogating from the MFN principle is the recent additional tariffs on steel applied by the US on imports from certain countries (Miles 2018). The MFN clause was imposed to enable trade without discrimination and getting closer to a most-efficient trading system, where comparative advantages can unfold their welfare benefits. However, GATT includes possible exemptions from the MFN-clause, for example for unilateral trade liberalisation tools such as GSPs and bilateral resp. multilateral trade liberalisation policies such as PTAs.

GSPs are preferential unilateral reductions of tariffs, usually granted by a developed country towards a least-developed country (LDC), as GSPs are used as a development tool to assist LDC increasing their exports. They are exempted from MFN as they aim to level the playing field and thereby to give LDCs a chance to catch-up and develop their comparative advantages. Besides GSPs, unilateral approaches to liberalise trade are often unattractive to WTO members as it means that one gives away leverage (market access) to everyone within the WTO for free, i.e. without negotiating anything in return. Today, most countries are members of the WTO, making the implications of unilateral liberalisation of WTO members almost global.

Much more popular to liberalise trade is thus the other exemption from the MFN clause granted to customs unions, free trade areas and PTAs. The legal basis for PTAs has a far less prominent position within GATT than the MFN clause and is only granted in Article XXIV (GATS already in Article V), implying that the overall and global aim should be to adhere to the MFN principle and only exceptionally to derogate from it. Countries should thus stick to the global approach that does not discriminate among WTO members, yet they are given the possibility to circumvent it by negotiating PTAs. Moreover, the number of PTAs signed has increased substantially and keeps on rising. Even some LDCs prefer to negotiate PTAs over GSPs granted to them (Acharya et al. 2011, 37). This development is at least partially influenced by the loss of momentum of the multilateral approach of trade liberalisation after the Uruguay Round (1986-1994) that led to the formation of the WTO. The Ministerial Conferences held by the WTO members have still an essential multilateral influence on the trading system, yet the rounds on trade negations have not done so well. The Doha Development Round started in 2001, yet negotiations broke down in 2008 and since had not been revived. Still, the number of members in the WTO has increased from 123 in 1994 to 164 members in 2018 so far, which means the MFN principle is applicable even more broadly now although no new rounds were successfully concluded. The multilateral approach has thus not stopped but compared to the development and coverage of PTAs at least slowed down. PTAs have surged, especially after the WTO was concluded and the rationale for signing PTAs is the same as with entering the WTO: to improve the domestic welfare by facilitating trade. In the subsequent section, I will describe the rationale of entering a PTA by looking at the preferential reduction of tariffs and the effects on the domestic market in more detail.

A preferential tariff can have three different effects on global welfare. These are displayed in the following two figures. *Figure 2* shows the positive PTA-effect of trade creation and *Figure 3* the negative and positive PTA-effects of trade diversion.

The outset is the same for both effects shown in *Figure 2* and *Figure 3*. The domestic market enters into a PTA with country A, and they decide to reduce tariffs in the domestic market preferentially. Thus, in the domestic market, tariff (T) is preferentially reduced for country A (from P_A+T to P_A+T_{PTA}). For the other trading parties outside of the agreement, represented by country B, the initial tariff still applies (P_B+T). The trade effect alters depending on the trading partner, country A. If the trading partner is the most efficient producer of a good, then trade will be created and if another trading partner outside of the agreement is the most efficient producer than trade is diverted. The mechanisms for both scenarios are explained in more detail in the following paragraphs.

In *Figure 2* and *Table 3: PTA-Effect of Trade Creation (Figure 2)*, one of the possible trade effects of a PTA is displayed: trade creation. The direction of the effect is the same as illustrated above in *Figure 1* (right graph), yet on a smaller scale as tariffs are not being eliminated. In this scenario, country A was the more efficient trading partner even before the PTA entered into force ($P_A<P_B$ resp. $P_A+T<P_B+T$). The preferential tariff granted to country A thus does not change the comparative advantage of country A yet amplifies it ($P_A+T_{PTA}<P_A+T<P_B+T$). Same as in *Figure 1*, the decrease in the domestic price means that fewer of the domestic producers will be able and willing to supply this product (decrease in domestic supplied quantity from Q_2 to Q_1), but more domestic consumers will be able and willing to demand it (increase in domestic demanded quantity from Q_3 to Q_4). The negative effects are the loss of domestic producers (–*a*) and a loss of government revenue due to a loss of tariff income (–*c*), whereas the positive effect for the domestic

market is the consumer surplus (*a+b+c+d*). But unlike in *Figure 1*, here, the government still applies a preferential tariff and not the entire tariff revenue is lost (only *–c* is lost, *f* remains). Through the creation of trade, additional tariff revenue is generated (*e+g*). Hence the overall effect for the domestic market is also positive (*b+d+e+g*), as the elimination of the tariff leads to a creation of production (*b*), consumption (*d*) and leads to additional tariff revenue (*e+g*). The deregulation of trade by reducing the tariff preferentially thus creates trade.

Figure 2: PTA-Effect of Trade Creation

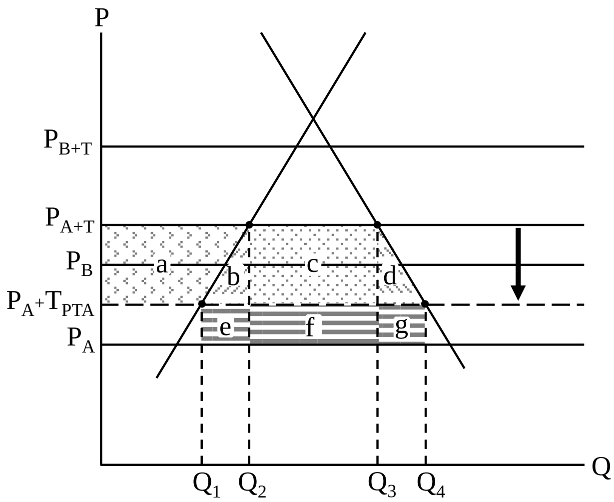


Table 3: PTA-Effect of Trade Creation (Figure 2)

Effects on the Domestic Market	**PTA-Effect: Trade Creation** Scenario 1: Reducing a Tariff for the most Efficient Producer
Consumer Surplus	(a + b + c + d)
Producer Surplus	– a
Government Revenue	– c + e + g
Domestic Welfare	b + d + e + g
Domestic Effect	**Positive: b + d + e + g**

In *Figure 3* and *Table 4: PTA-Effect of Trade Diversion (Figure 3)* I will show another scenario that illustrates the other possible trade effect of a PTA: trade diversion. Trade diversion can have either a negative or a positive domestic effect. In both cases, the domestic market enters a PTA with country A and grants them a preferential tariff treatment. Here, country B was the producer with the comparative advantage ($P_B<P_A$ resp.

$P_B+T<P_A+T$), but with the new applied preferential tariff for country A, trade is diverted from the more efficient producer, country B, towards the one with the better tariff conditions ($P_A+T_{PTA}<P_B+T<P_A+T$), country A. Here, the effect of the PTA leads to an efficiency loss as the comparative advantage of country B is overpowered by trade regulation through preferential tariffs for country A. Same as in the figures before, the decrease in the domestic price means that fewer of the domestic producers will be able and willing to supply this product (decrease in domestic supplied quantity from Q_2 to Q_1), but more domestic consumers will be able and willing to demand it (increase in domestic demanded quantity from Q_3 to Q_4).

The positive effect for the domestic market is the consumer surplus ($a+b+c+d$) and the additional government income ($e+g$), whereas the negative effects are the loss of domestic producers ($–a$) and a loss of government revenue due to a loss of tariff income ($–(c+h)$). Partial tariff revenue ($–f$) lost due to the trade distortion is replaced in full by the preferential tariff from country A (f). The overall domestic welfare can thus have a positive or a negative effect, depending on the balance between the net loss ($–h$) and the net surplus ($b+d+e+g$). In *Figure 3*, the left graph displays a trade diversion scenario with a negative domestic effect ($–h>(b+d+e+g)$), whereas the right graph illustrates a trade diversion scenario with a positive domestic effect ($–h<(b+d+e+g)$):

Figure 3: PTA-Effect of Trade Diversion

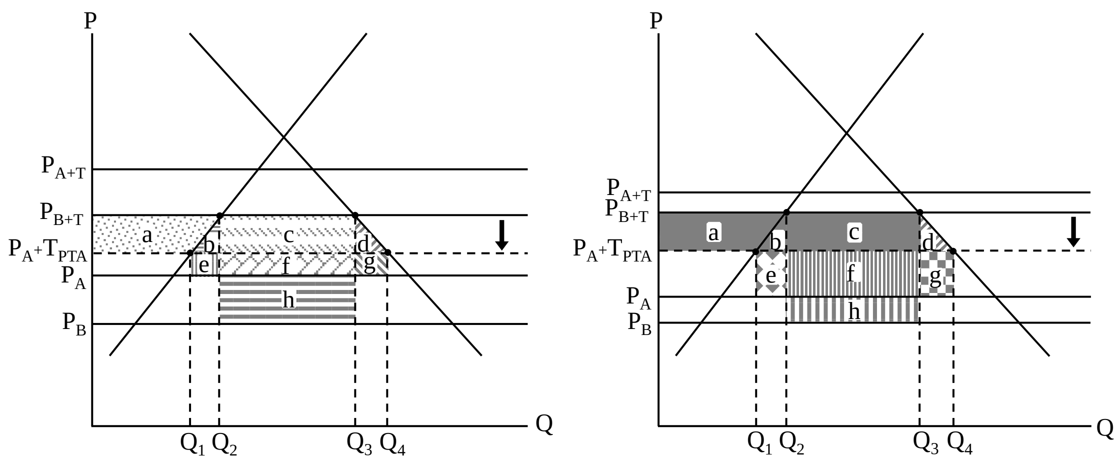


Table 4: PTA-Effect of Trade Diversion (Figure 3)

Effects on the Domestic Market	**PTA-Effect: Trade Diversion** Scenario 2: Reducing a Tariff yet not for the most Efficient Producer	
Consumer Surplus	a + b + c + d	
Producer Surplus	– a	
Government Revenue	– c + e + g – h	
Domestic Welfare	b + d + e + g – h	
Domestic Effect	**Negative: (b + d + e + g) < – h**	**Positive: (b + d + e + g) > – h**

Figure 3 demonstrates that it is crucial for countries to carefully evaluate the concrete effects that they want to achieve through the PTA and take into consideration their trading preferences with countries in and outside of the PTA. Generally, policymakers will aim to enter a PTA that either creates trade (*Figure 2*) or diverts trade with a positive impact on the domestic welfare (*Figure 3*, graph on the right). Of course, countries sign PTAs to increase their domestic welfare and will aim to avoid trade diversion effect with negative implications for their domestic welfare (*Figure 3*, graph on the left). It might seem, that the rationale of PTAs that aims to reduce trade barriers in a beneficial manner for domestic welfare follows a different logic than the one for IPRs, which are commonly associated as being a barrier to trade. In the following subchapters, I will therefore firstly elaborate on the rationale of protecting IP by IPRs (*2.2.1.2*) and in the subsequent subchapter build the bridge to the rationale of including IPRs in PTAs (*2.2.1.3*).

2.2.1.2 Rationale of IPRs

According to the World Intellectual Property Organization (WIPO), there are two main rationales for protecting intellectual property: moral rights and economic incentives (World Intellectual Property Organization 2008, 3).

The moral right rationale derives from the idea that if one has created something through mental capabilities, the benefits arising through said creation should be awarded to its creator. For example, if an author writes a book then the author should benefit from its sales and others should be restricted from doing the same. In this regard, John Locke's theory on property often serves as a cornerstone of the IP argument:

> *"Though the earth, and all inferior creatures, be common to all men, yet every man has a property in his own person: this no body has any right to but himself. The labour of his body, and the work of his hands, we may say, are properly his. Whatsoever then he removes out of*

the state that nature hath provided, and left it in, he hath mixed his labour with, and joined to it something that is his own, and thereby makes it his property. It being by him removed from the common state nature hath placed it in, it hath by this labour something annexed to it, that excludes the common right of other men: for this labour being the unquestionable property of the labourer, no man but he can have a right to what that is once joined to, at least where there is enough, and as good, left in common for others."
John Locke, Second Treaties of Government (1967 Chapter V, Article 27)

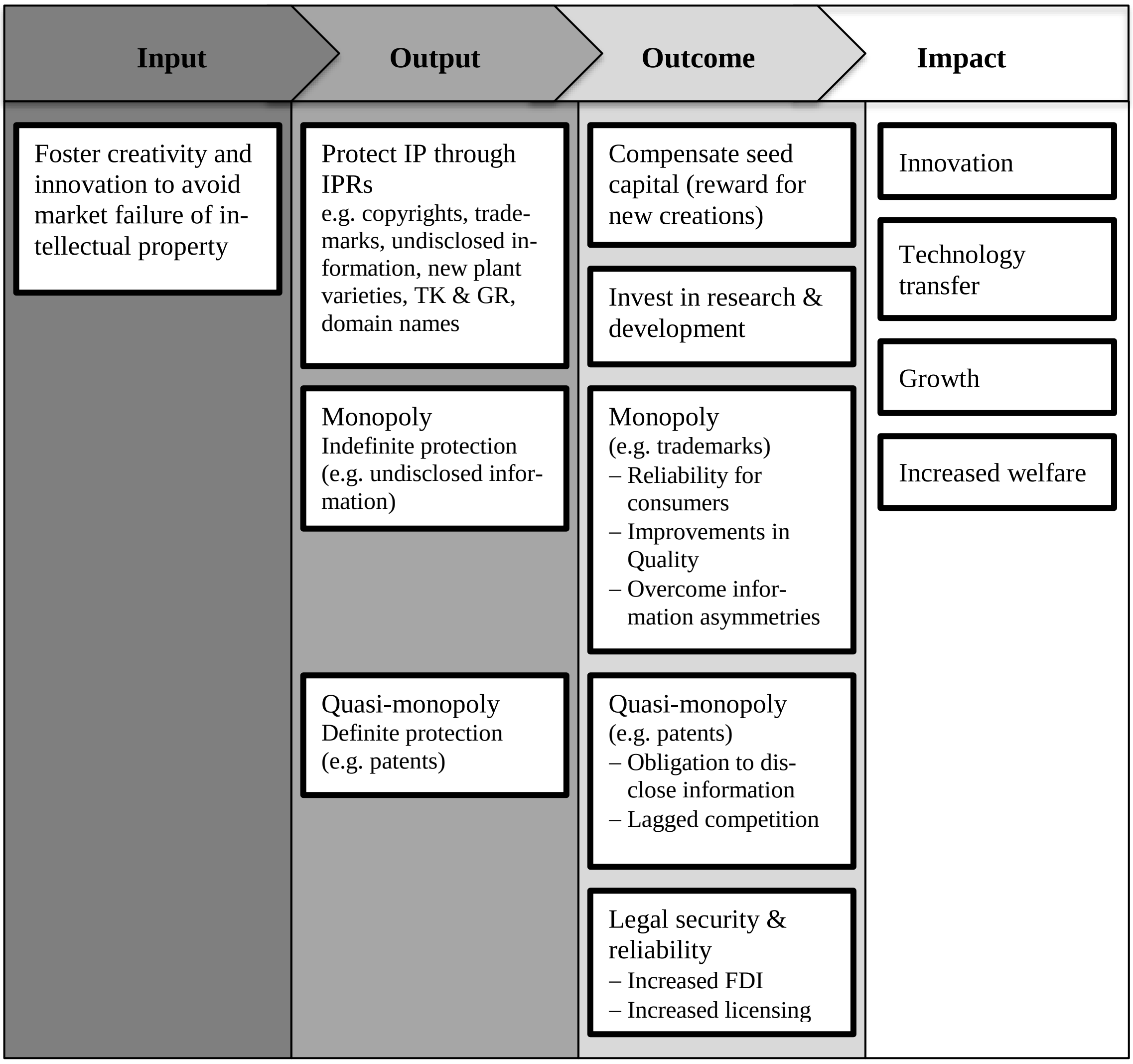
Locke's argument for property rights is often extended to IP, arguing that adding intellectual labour applied to a good is the modern version of physical added labour to a good. Subsequently, intellectual property created through mental labour should be protected by IP rights, same as property by property rights.

The economic incentive rationale is based on the assumption that IP has the same characteristics as a public good. Public goods are characterised by being non-rivalrous and non-excludable (Maskus 2012, 6). Regarding IP, this refers for example to the fact that by consuming a book its value is not diminished in quantity or quality (non-rivalrous), and others cannot be excluded from reading it as well (non-excludable). The issue with public goods is the cost of providing that good and extended to IP the costs of creating intellectual property. Furthermore, others are non-excludable entails that the problematic of free rider, i.e. people benefit without contributing. It is only logical then that rational actors rather copy or consume instead of being creative themselves, as usually copying or consuming is cheaper than inventing something novel. In the case of computer programs, it can take years to design a fitting algorithm or code, and it will only take seconds to copy and paste it. This, in turn, means that the benefits for the producers of IP drop until there is no more or at least not enough incentive to create IP anymore, also referred to as a market failure. Protecting IP by IPRs can serve as a remedy for this free rider problem and the resulting market failure. IP can be made excludable by IPR law defining the terms of accessing IP, at least temporarily. Another part of the economic incentive rationale is the utilitarian justification of IP: the temporary restriction of the use of IP leads to an incentive to create IP and after the protection ends to the dissemination of knowledge.

Following this argument, there is a need for the government to correct the natural IP situation to avoid market failure. In the case of intellectual property, the economic incentive rationale states that without protection there is no incentive to be creative and innovate. This means that without government intervention and the imposition of IPRs, there is no innovation and hence no growth potential for an economy. By regulating intellectual property, the government thus improves the overall welfare (Williams, 2015, p. 54). Over time, the economic rationale has expanded and nowadays many more effects are associated with intellectual property and its protection such as foreign direct investment (FDI) and research and development (R&D). Furthermore, IPRs are not only used as a tool to incentivise innovation, yet also to overcome information asymmetries in terms of characteristics, reputation, and quality. The different forms of IPR and their intent are listed in *Table 1: Forms of IPR*.

To illustrate the rationale of IPR in more detail, I use the concept of a logic model (see Sager and Rüefli 2005, 107 et seqq.) and structure the different logic steps of IP protection along the features of input, output, outcome and impact in *Figure 4*.

Figure 4: Rationale of IPRs



The *input* describes the problem to be resolved by political intervention. In the case of IP, it is the question of how to create a climate where innovation and creativity can prosper even if the products of IP might be easily copiable. The aim is to foster creativity and innovation to avoid market failure of intellectual property. The *output* is the policy result aimed to resolve the input problem and change the behaviour of actors. For IP it is the protection of intellectual property by IPRs such as patents and trademarks. The specific IPR forms and their protection can be highly divergent but can roughly be distinguished into two categories of monopoly and quasi-monopoly. Certain IPR forms grant the IP owners a monopoly right with mostly indefinite protection such as trademarks, whilst others also grant monopolies with a clear time limitation on the protection granted such as patents.

The *outcome* describes the indented effect on the groups targeted by the policy and reflects the mid-term goals of the policy. IPRs are associated with ideally a combination of preferred outcomes. IPRs intend to reward creativity and incentives investment in R&D. Furthermore, IPRs aim to create a secure, reliable legal framework that is attractive to FDI and licensing. The intended outcomes of IPRs are to create reliability for consumers, improve the quality of the product through the resulting need to protect one's reputation and to overcome information asymmetries. By protecting for example trademarks, consumers can better orientate themselves in the market, as they have more information and can quickly identify and differentiate products. For producers of IPR it means that it is worth to invest in the quality of the product as customer preferences, their margins and reputation are built on it. Thanks to the IPRs people can easily differentiate products, e.g. McDonald's from Burger King or Channel from H&M. Also, consumers can rely on the authenticity of products if IPRs are protected, i.e. that Coca-Cola is Coca-Cola and not Pepsi. This might sound benign, yet in the case of pharmaceuticals, it can be essential if one consumes the original or an imitation (see Bunker 2007). The strict and sometimes indefinite protection of the moral rationale is applied mainly for undisclosed information such as trade secrets and in a restricted form to trademarks. Often there is a time limit on the trademark protection, yet it is multiple (endless) times renewable. The IPR forms with a definite dimension have some additional traits. After the term of protection has ended the products can still exist, yet there is an obligation to disclose the protected information. This creates a lagged competition that after disclosure rises at a fast pace. For example, in the case of a pharmaceutical drug, the patent needs to be filled, and in the patent application, the patentable information such as the process of making a drug has to be included.

After the patent runs out, the protected patented part of the information on the process of making a drug has to be disclosed, and the information will be shared, meaning that generic producers can relatively expeditiously enter the market after the patent term runs out.

The *impact* describes the overall effectiveness and refers to the effects on the broader society, besides and including the intended target groups. The impact reflects the overall effects and long-term goals of the policy. Based on the outcomes and taking into account the entire economy, IPRs should lead to innovation, technology transfer, growth, and increased welfare. Innovation should prosper as there is an incentive to innovate by the additional or eternal gains a product can reap; technology transfer refers to the obligation to disclose for time-limited IPRs and the consequential disclosure of protected information; IPRs are the safeguards of innovation and thus necessary to maintain growth (see Hassan, Yaqub, and Diepeveen 2010).

As *Figure 4* depicts the rationale of IPRs, i.e. why countries protect IP by IPRs, it leaves aside the unintended outcomes and impacts of IPRs such as an overprotection of intellectual property hindering or delaying technology transfer through extended protection terms. These situations will be discussed in more detail in the following subchapter.

And even though the rationale of IPRs might suggest that rationally behaving countries should protect IPRs, that is not necessarily the case. For instance, it is often criticised by developed countries that developing countries lack a sufficient domestic IPR regulation, especially regarding the enforcement of IPRs. However, a developing country will have more pressing concerns and areas in need of financial development than IPRs. Besides the capital-intensiveness required for protecting IPRs such as trained patent office employees or additional customs control, the IPR protects goods stem mostly of foreign IPR producers. Thus the developing countries are expected to invest their scarce resources into IPR protection even though the benefits are predominately yielded abroad. Park (2005, 2), for instance, names costs arising from more stringent IP protection such as " *infrastructural costs (of rewriting national laws and providing the means for enforcement and administration), static deadweight losses (in terms of the deviation of markets from competitive structures), and rent transfers (from consumers and rival producers to rights holders)*".

Moreover, even developed countries are selective on when to uphold the rationale of IPRs. For example, Switzerland employs an ambiguous regime of copyright regulation based on arguments of social interest trumping the IPR rationale of IPRs as necessary market intervention. In Switzerland, the streaming, downloading, personal as well as educational use and dissemination of copyrighted material is allowed as long as the protected material does not concern software. Software being the one domain where Switzerland is an economically relevant producers of IPR and where the domestic market would be harmed without effective IPR protection (Eidgenössisches Justiz- und Polizeidepartement EJPD 2011). Therefore, the rationale of IPRs might be abandoned where the market intervention is not in favour of the domestic market and the reduction of trade barriers serves the economy better. Consequently, the protection of IPRs and the inclusion of IPRs in PTAs has become a politicised topic that not always follows the rationale of IPRs. The next subchapter will therefore combine the two concepts of the rationale of PTAs and the rationale of IPRs to follow up on the question why countries want to include IPRs, commonly seen as a barrier to trade, in a PTA, aiming to reduce trade barriers.

2.2.1.3 Rationale of IPRs in PTAs

IPRs and PTAs might sound like an odd combination. On the one hand, policymakers enter PTAs to reduce trade barriers in order to avoid trade distortion and increase domestic welfare (see *2.2.1.1 Rationale of PTAs*). On the other hand, policymakers try to avoid a market failure and foster an innovative environment for IP by implement IPRs, which are considered to be barriers to trade (see *2.2.1.2 Rationale of IPRs*). So, if IPRs are understood as barriers to trade and PTAs as a mean to overcome barriers to trade: why do countries regulate IPRs through PTAs and thus include trade barriers in trade agreements with the purpose of reducing trade barriers?

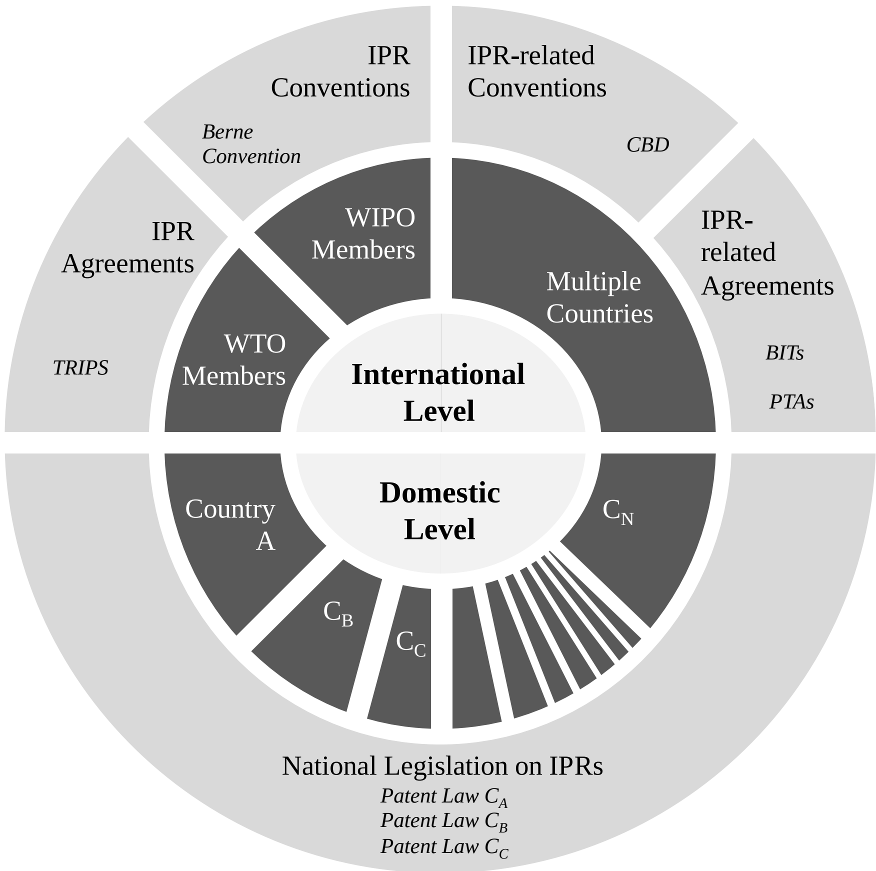
According to Snorrason (2012), there are four main reasons why it makes sense to regulate trade by imposing barriers. Firstly, countries impose barriers to affect the world price (P_W) and improve the terms of trade. Secondly, countries impose barriers to improve and optimise the income distribution in the domestic market. Thirdly, countries impose barriers to *“achieve exogenously given targets for trade, production or domestic consumption”* (Snorrason 2012). Fourthly, countries impose barriers to counterbalance a market failure. This last point is one of the key arguments to protect intellectual property by IPRs and is the reason IPRs are included in PTAs: to avoid market failure. Even though the combination might be contradictory on the surface the connection between IPRs and PTAs becomes clear once looked at more closely.

First of all, it is a matter of coherent regulation as IPRs are trade-related. Besides the IPR rationale (*Figure 4: Rationale of IPRs*) and the traits associated with IPR such as innovation, technology transfer, growth and increased welfare, there are other clear relations of IPR and trade, making the inclusion of IPRs in trade agreements consequential. Nowadays, vertically integrated supply chains have mostly transformed into global ones. With products not only produced in one country but also divided geographically, the outsourcing of production can become a risk if the IP behind the goods is not protected abroad as well. Exporters are thus faced with the decision to either keep the IP protected steps within the domestic market or only invest in a market where their IPR standards are met (Chopra and Sodhi 2000, 57). When negotiating PTAs and setting the basis for trade rules, it makes sense to include IPRs as well. Furthermore, domestic IPR law affects the regulation of imports, yet has no control over IPR protection of exports and transitional goods. By including IPRs in PTAs countries can thus regulate IP beyond the domestic border and build a secure legal framework for their exporting producers.

Secondly, as countries see IPRs as a necessity for a growing market and domestic welfare, countries will not try to abolish the trade barriers posed by IPRs, and instead try to harmonise and thus reduce them as far as possible and reasonable. This implies that countries can both try to include more stringent or less stringent IPR regulation in PTAs, as long as it harmonises the domestic and foreign IPR regulation. In order to impact more than just the domestic IPR regulation, countries turn to bilateral and multilateral agreements. As Helfer (2009, 39) put it, IPR regulation is "composed of a dense thicket of linkages and relationships among treaties, international organisations, and multilateral, regional and bilateral negotiating venues." *Figure 5: Fora of IPR Regulation* shows the different fora of IPR regulation on the domestic and the international level, the actors involved and some examples for each category.

At the core, IPRs are territorial-based rights, and the main forum for IPR regulation is, therefore, the domestic level. This can become problematic for the economy once producers want to export their goods and have to abide by other standards than the ones in their domestic market. Every adaption due to differing regulation increases the costs of exportation and constitutes a barrier to trade. For example, if a patent was granted in the domestic market for a pharmaceutical drug, and producers had to provide a clinical study, i.e. test data, to prove the functionality of their drug. Now they would like to get a patent abroad and are required to provide novel test data for the same drug due to differences in the patent regulation abroad. This is not only time-intensive but also very costly. As every country has their legislation on IPRs such as patent law, copyright law or trademark law, it is almost impossible for exporters to adapt their products to all export markets individually. So early on, countries turned to bilateral and multilateral venues to ensure a broad, coherent regulation of intellectual property.

Figure 5: Fora of IPR Regulation



On the international level, there are four pivotal fora of IPR regulation: IPR agreements, IPR conventions, IPR-related conventions, and IPR-related agreements. Even before TRIPS came into force, there were extensive multilateral IPR conventions in place, such as the Paris Convention for the protection of industrial property signed in 1883 (patents, trademarks, industrial design, GIs), the Berne Convention for the protection of literary and artistic work (copyright) signed in 1886, and the Rome Convention for the protection of performers, producers of phonograms and broadcasting organisations (copyright and related rights) signed in 1961. In 1967, the WIPO was established as one of the United Nations agencies. Nowadays, most of the IPR conventions and some of the IPR-related treaties are under the auspice of the WIPO, making the WIPO one of the major organisations in regard to multilateral IPR regulation. IPR conventions mostly focus on a specific area of IPR such as copyright and seldom provide a holistic IPR regulation scheme. TRIPS was thus a major step from a patchwork of different IPR conventions towards a harmonised IPR system.

To this day, TRIPS is by far the most important multilateral IPR agreement on the international level. It is substantially based on the Paris Convention, but additionally includes provisions on copyrights, topographies of integrated circuits, undisclosed information, and new plant varieties. With TRIPS came a whole bundle of IPR regulations Maskus (1997, p. 684) covering a multitude of IPR areas and TRIPS includes two major regulation milestones for IPR: it grants most-favoured-nation (MFN) treatment in TRIPS Article 4 and national treatment (NT) in TRIPS Article 3. NT prohibits discrimination between domestic and foreign nationals regarding IPRs, whereas MFN grants the most favourable IP rights granted to one foreign country also to all other countries. This means that every country that is part of the WTO and has ratified TRIPS must grant IPR provision non-preferentially. IPR rules apply to domestic or foreign producers alike, and there is no differentiation between different foreign countries as the domestic law applies to all in the same manner. Another benefit of TRIPS is the inclusion of specific enforcement mechanisms that make the IP rights more feasible. TRIPS is governed by the WTO, the other major multilateral organisation involved in IPR regulation. After TRIPS, many other IPR conventions were signed such as WIPO internet treaties consisting of the WIPO copyright treaty (WCT) and the WIPO performance and phonograms (WPPT) in 1996.

Besides the IPR conventions and agreements, there are also treaties that have a different emphasis, yet also include IPR regulation. An example of such an IPR-related convention is the Convention on Biological Diversity (CBD) signed in 1992, which focuses on biodiversity, yet also encompasses IPR regulation on traditional knowledge and genetic resources. These IPR-related conventions often include only one or a few forms of IPRs and do not encompass comprehensive IPR regulations. There have been attempts to conclude other far-reaching multilateral IPR agreements, yet so far, they were unsuccessful. For example, the Anti-Counterfeiting Trade Agreement (ACTA) signed in 2011, which has not entered into force yet due to a lack of the required ratification of at least six member countries. It is aimed to create more stringent universal enforcement mechanisms for IPRs, yet ACTA faced many critics especially from the public, lost international support and is unlikely to enter into force any time soon. With the stagnation of negotiations of new multilateral IPR agreements, countries have also turned to IPR-related bilateral, sometimes multilateral, agreements.

Regarding IPR-related agreements, there are two primary forms: PTAs and bilateral investment treaties (BITs). PTAs focus on trade regulation and BITs regulate various aspects of investment. BITs rarely include specific articles on IPRs, yet some of them do include IP in their definition of investment. This means that all further provisions regulating investment also apply to IP and can be considered as IPR regulation. PTAs on the other hand often have a specific article or an entire chapter on IPRs, mostly encompasses multiple IPR forms and provide a broader IPR regulation than BITs. PTAs often include references or obligations towards other IPR conventions. Therefore, PTAs also ensure a certain degree of multilateral coherence on IPR besides setting new standards. And since other multilateral approaches for IPR regulation have come to a halt, PTAs have become an essential forum of bilateral and multilateral IPR regulation.

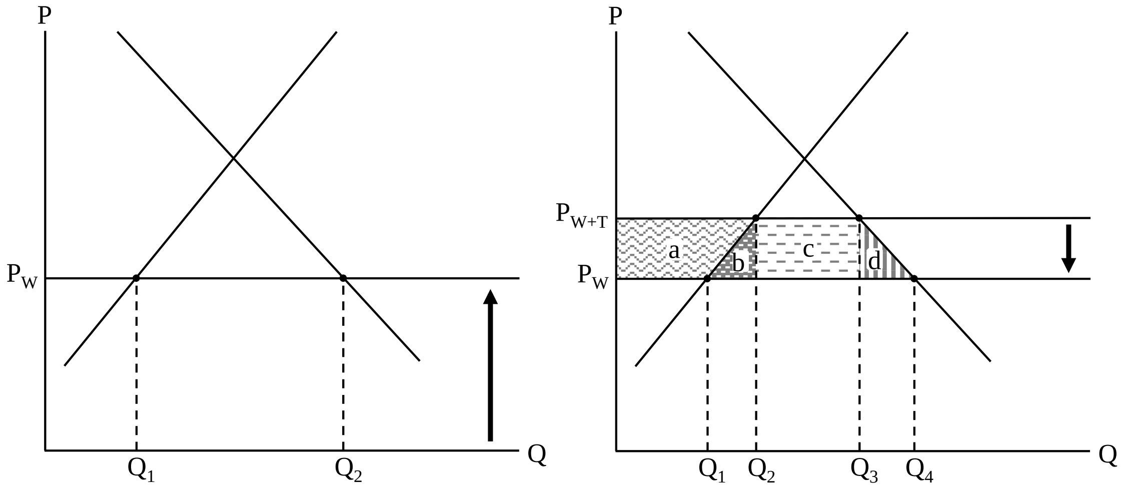
According to trade theory, the benefit of regulating trade in a multilateral manner such as the WTO is that by applying the provisions (almost) globally, trade is not diverted, whereas PTAs run the risk of diverting trade with a positive or even negative effect on the domestic economy (Cottier, Sieber-Gasser, and Wermelinger 2015, 465). At this, the rationale of trade theory relies on tariffs that are granted an exemption from the MFN clause in GATT and can be applied preferentially through trade agreements. These preferential tariffs can result in trade diversion, whereas the MFN approach ensures a level playing field for all trade actors (see *2.2.1.1 Rationale of PTAs*). This exemption of the MFN clause does not extend to IPRs, and after the ratification of TRIPS, countries cannot grant IPRs preferentially any longer. IPR provisions in PTAs are thus non-discriminatory (Fink 2011, 389). For example, if a domestic market signs a PTA with country A and includes a provision to extend copyright protection to 70 years after the death of the author, this provision is implemented in the copyright law of both the domestic market and the market of country A. This law then applies not only to members of the PTA, i.e. the domestic market and country A but to all non-PTA members from other countries as well. So even if country B is not a member of the PTA, its copyrighted work will be protected in the domestic market as well as country A for 70 years after the death of the author as well. This means that IPRs in PTAs have an MFN character even if not mentioned explicitly in the PTA if the members have ratified the TRIPS agreement.

Besides the positive aspects of the MFN regulation granted to IPR provisions, it also has a downside. Due to the MFN character of IPRs granted in PTAs, these IPR provisions have a wide-reaching effect and PTAs can become the tool to set IPR standards. PTAs are based on bilateral or sometimes multilateral negotiations that have a different power ratio than significant multilateral agreements such as TRIPS or GATT. The inclusion of IPRs in PTAs can thus lead to a global spread of IPR regulation based on bilateral, sometimes multilateral, negotiations. For example, if the US signs multiple PTAs including IPR provision with different countries. These provisions then apply in the US and their PTA-partner countries, and if those countries sign other PTAs, they most likely will include similar provisions on IPR. This will spread the IPR regulation of the US PTAs and might not reflect the same IPR provisions negotiated in bigger multilateral agreements. Once these PTAs enter into force, the included IPR provisions become domestic law, applicable to domestic and foreign nationals alike (see also TPP and CPTPP in *1.2 Relevance*). MFN in PTA can lead to a quasi "multilateralisation" of bilateral concessions.

Nevertheless, as other venues of IPR regulations have stagnated, IPRs In PTAs are currently one of the most promising fora for IPR regulation beyond the domestic market, and at least due to their MFN characteristic, IPRs will not lead to trade diversion, as they are not preferential (according to the *Rationale of PTAs*). Rather IPRs in PTAs can lead to either trade distortion or trade creation. From a PTA-perspective, IPRs are barriers to trade and will lead to trade distortion (*Figure 1*, left graph), whereas according to the IPR rationale there is no IP without IPRs, thus including IPRs in PTAs leads to trade creation (*Figure 1*, right graph). The rationale for including IPRs in PTAs is a bit different as it combines both rationales for PTAs and IPRs: either trade is created by ensuring a market for intellectual property by guarantying (a certain level of) IPR protection (*Figure 6*, left graph), or trade is created by harmonising IPR standards (*Figure 6*, right graph).

On the left-hand side of *Figure 6,* a market is created through IPR protection in PTAs. Beforehand, the IPR protection in the domestic market was too inefficient (or non-existent), and through IPR in PTAs the market of intellectual property becomes functional and creates trade. On the right-hand side of *Figure 6*, trade is created through the harmonisation of IPRs through PTAs and the concomitant reduction of trade barriers. When exporting producers are assured that their IPR is protected abroad, they are more willing to supply to those markets or invest in them. Furthermore, if producers have the same or at least similar IPR regulations in their domestic as their export market, their harmonisation costs are reduced. Thus, IPRs in PTAs protect the domestic market yet also make the markets abroad more reliable and attract trading and investment partners. It is thus expected that the non-preferential IPR regulations in PTAs lead to trade creation by ensuring and harmonising IPR regulation (*Figure 6*).

Figure 6: Trade Creation Through IPRs in PTAs



According to Fink (2011, 388), IPRs have another dissimilarity to tariffs that needs to be considered for the rationale of IPRs in PTAs. The trade rationale argues for free trade, i.e. the more liberalised the trading system is, and the lower tariffs are, the better. As demonstrated above, the rationale of including IPRs in PTAs takes the opposite direction and calls for more regulation. So here, IPRs defer from tariffs as it cannot be conclusively said that more stringent regulation of IPRs has a positive effect on trade (Fink 2011, 388). It comes as no surprise that the discussion nowadays is less about if IPR should be included in PTAs and more about what level of protection should be granted, bearing in mind the standard setting impact of IPRs in PTAs beyond the PTA members. The debate on the appropriate level of IPR protection in PTAs is not new, and generally, there are two strands: one voting for a shift towards more stringent IPR protection, the other for less stringent IPR protection. Even tough TRIPS is often referred to as the minimum standard of IPR protection, that term is only accurate from a particular perspective. Before TRIPS, there were intense discussions among countries on universally applicable IPRs.

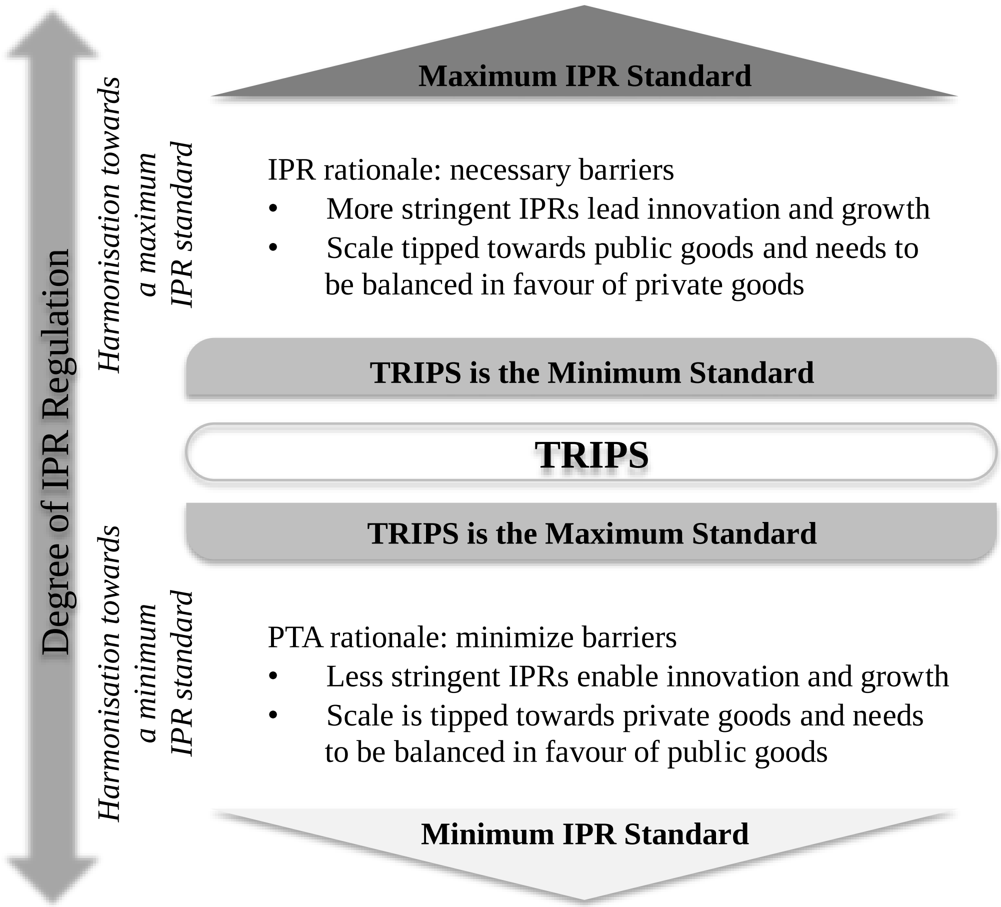
> *"During the 1970s and early 1980s as part of their push for the New International Economic Order (NIEO) the G77 developing countries sought to have the international IPR regime relaxed to allow them to acquire technology cheaply, if not, freely. At the same time, multinational companies in USA & Japan felt that the existing IPR regime was not stringent enough*

to protect their business interests. They lobbied their countries for inclusion of IPRs in GATT (the General Agreement on Trade and Tariffs) negotiations, hence the signing of the TRIPS Agreement by WTO member states in 1994." Wekesa (2009, 5)

So even before TRIPS entered into force there was a discussion about the optimal level of IPR protection, where most developing countries argued for less stringent protection and developed countries for more stringent protection. The result was the TRIPS agreement, which until today, is the main standard of IPR protection, and to some countries, it represents a minimum standard and to others a maximum standard of IPR protection. Mostly those countries with IPR industries worth protecting consider the TRIPS agreement to be a minimal standard of IPR protection. They thus aim for more stringent IPR protection and a move towards a maximum standard of IPR protection in PTAs. On the other end of the spectrum are those countries without big IPR industries, that saw TRIPS already as the maximum standard of IPR protection that they were willing to concede to and now would rather move towards a minimum standard of IPR protection (see Halbert 2011). *Figure 7* illustrates the diverging ideals of IPR standards and the opposing sides of the rationale of how stringent IPRs should be regulated through PTAs.

The diverging ideals of IPR protection in PTAs shown in *Figure 7* are based on the rationale countries give more weight to. Countries that see TRIPS as a minimum standard and aim for a maximum standard of IPR protection in PTAs give more weight to the rationale of IPRs and argue that more stringent IPR leads to more innovation and growth. IPRs are thus necessary trade barriers that can still be harmonised upwards without distorting the market, and the balance between public goods and private good is still tilted towards the public. This should be corrected by including more stringent IPRs in PTAs and harmonise towards a maximum standard of IPR protection. On the other hand, some countries give more weight to the rationale of PTAs and aim to minimise the trade barriers posed by IPRs. Unlike the time before TRIPS came into force, countries currently mostly do not want to abolish IPRs entirely and instead aim to reduce the barriers that IPRs pose to trade. This can be done by keeping or extending the flexibilities granted under TRIPS and by further agreeing to less stringent, flexible IPRs in PTAs. This will lower the trade barriers and enable innovation and growth. The underlying argument here is that the scale between private and public goods has already lost its balance and the public side needs to regain weight.

Figure 7: Diverging Ideals of IPR Standards



Today, the differentiation between developing and developed countries is falling short in categorising countries demand for a maximum or minimum IPR standard. The subsequent two paragraphs will highlight why both developing and developed countries should have ambiguous preferences towards IPR regulation.

With the rise of more stringent IPR regulation in some countries, some downsides of stringent IPR regulation have surfaced, most prominently in the area of public health and access to medicines. In TRIPS, patent protection was so stringent that soon after TRIPS entered into force, some countries feared for their fair access to medicines, with a focus on the pandemic of HIV/AIDS at that time. With TRIPS, the access to generic drugs became more limited and especially developing countries were aware of the impact on their public health situation (Coriat and Orsenigo 2014, 230). The collective effort and organisation of developing countries led to the Doha Declaration on the TRIPS and Public Health in 2001, that reinforced countries rights to circumvent the patent law in order to protect public health and ensure the access to medicines (Roffe and Spennemann 2014, 443–44). This improved the conditions for developing countries, e.g. for the effective use of compulsory licensing to import generic and hence cheaper drugs. Still, there is concern that some TRIPS provisions were not balanced enough and even more worries that by including more stringent provisions in PTAs, the flexibilities granted in TRIPS will diminish. This is rooted in the assumption that by raising the level of IPR protection ever higher, the intended outcome of IPRs will come undone. If IPRs are too stringent than they become barriers to trade as well as innovation and technology transfer and thus defeat their purpose of enabling a creative environment.

Furthermore, many creations are not absolute novelties but rather built upon previous ideas and inventions. When IPR protection becomes too rigorous, then the market for new intellectual property shrinks immensely. Indications for such a trend can be identified for example in the area of patents. Fink (2011, 388) argues that a balance can be found by limiting the duration of IPRs and granting exceptions. However, in PTAs, the duration of protection of patents is often extended, which means that competition is lagged further, consumers have to pay a higher price even longer, and technology transfer will happen later. Moreover, patent owner can draw on other ways to extend the protection for patents such as "evergreening", i.e. prolonging term by obtaining multiple patents for the same product or related subject matter, or "product-hopping", i.e. changing the sold product and receive a new patent for basically the same product (Lemley 2008, 30; Love 2012, 1351), or "patent trolls", i.e. a description of non-inventive firms that buy patents not in order to produce or create something novel, yet "to force third parties to purchase licenses" (Chan and Fawcett 2005, 1). These extremes of misusages of the IPR ideals are detrimental for the competition and consumers alike, making the welfare effect of too stringent IPRs negative. Making a move towards a minimum standard no longer only a concern of developing countries.

On the other hand, there are also globally acknowledged arguments to move towards a maximum standard of IPR protection. First, the most significant multilateral IPR agreement TRIPS is out-dated. It has already been over 20 years since it has been negotiated and, in many ways, our trading system has changed and evolved. The digital development and the rise of the Internet have fundamentally changed our everyday life, from the way that goods are traded, i.e. e-commerce, to the way we gain knowledge and share our ideas. IPRs are affected in a multitude of forms by the internet not covered in TRIPS, and some countries have agreed to the WIPO internet treaties WCT and WPPT in order to regulate some of the shortcomings of TRIPS in regard to copyright (Taubman 2012, 308). It has become effortless to copy paste and share copyrighted material across the globe and increasingly hard to enforce copyrights, as the infringer and the infringed are often not inhabitants of the same country and thus not regulated by the same domestic copyright regulation. Besides entering multilateral conventions such as WIPO internet treaties, countries aim to protect their intellectual property in the digital age also through PTAs. The US with a significant entertainment industry is especially afflicted by the new ways of circumventing copyright protection and therefore includes stronger technological protection measures for copyrights in their agreements with almost no flexibility to circumvent copyright (Roffe and Spennemann 2014, 454–55). The digitalisation has also increased globalisation and the spread of counterfeit goods. This is not only critical for IPR producers and the infringement of their rights, yet also for consumers buying counterfeit products. In the case of counterfeit medicine, there have been international approaches to increase the enforcement for example by the Council of Europe's Convention on Counterfeiting of Medical Products and Similar Crimes Involving Threats to Public Health (MEDICRIME Convention), signed in 2010. The negative impacts of counterfeit goods have only a marginal impact on the markets in developed countries, yet a huge one on the markets of predominantly developing countries. According to Keitel (2012, 138) *"many countries in Africa and parts of Asia and Latin America have areas where more than 30 per cent of the medicines on sale can be counterfeit, while in many of the countries of the former Soviet Union the proportion of falsified/ counterfeit medicines is over 20 per cent of market value."* These means that a substantial part of the population is affected by counterfeit medicine, which needs to be corrected by more stringent IPR enforcement mechanisms.

So, both strands of the argument have legitimate claims, and the main issue is to find an efficient balance for IPR regulation that leads to positive net welfare. The question remains if there is a universal balance and thus a one-fits-all rationale for IPRs in PTAs.

2.2.2 Global Political Economy Theories

Of course, there are also other theories besides economic rationales explaining international relations and that could be helpful in explaining IPRs in PTAs. In the following section, I will briefly describe the four main theories of global political economy (GPE) to provide alternative rationales behind a country's choice of entering into a trade agreement and deciding upon the regulatory standards such as IPRs. The four major GPE theories are *2.2.2.1 Realism*, *2.2.2.2 Liberalism*, *2.2.2.3 Social-constructivism*, and *2.2.2.4*

Modern Marxism. Even though none of these theories offer forthright explanations on IPRs in PTAs, they at least indicate possible drivers of countries behaviour. At the end of each GPE theory section, I added the conclusions drawn for the rationale of IPRs in PTAs based on the particular GPE theory.

2.2.2.1 Realism

Realism has been the dominant theory in international relations and traces back to works of Thucydides, Machiavelli, Hobbes and Rousseau (Dunne and Schmidt 2008, 92). The main actor in realism theory is the state, which is driven by power relations (Frieden and Lake 2003a). How the state formulates its behaviour follows three main theoretical streams in realism: *classical realism*, *structural realism* and *neoclassical realism*.

Classical realism centres around the assumption that states are the central actors in international relations and their behaviour can be derived from human nature. The state, which is under constant threat of anarchy, acts in order to guarantee security for the state, is driven by the human desire to dominate others and strives for power (Morgenthau 1948). International relations are thus the logical consequence of human natures preservation of self-interest and aim for power, and are defined by power politics (Dunne and Schmidt 2008, 95). Or according to Watson (2014, 32): "*States will always act in a way that enhances their immediate power resources within the world economy because those power resources are crucial to shaping further bilateral and multilateral economic negotiations to their advantage*."

Structural realism agrees with the notion of international relations being a power struggle. However, it argues that this cannot be derived from human nature and that the state's behaviour rather is the result of a systemic deficiency. As power is unequally distributed among states, countries have to struggle to defend their interest as there is no supranational authority. Therefore, all international political outcomes can be explained by the power distributions at that given time, whereby countries can be ranked according to their power impact on the overall system and the structure of the system is determined by the number of highly powerful states. Only by a bipolar distribution of great powers within the system – such as seen during the Cold War with the two opposite poles of the US and Soviet Union – some form of stability can be achieved (Dunne and Schmidt 2008, 98). Furthermore, structural realism can be divide into defensive realism and offensive realism. The former stresses that states aim to maximise security, whilst the latter argue that states aim to maximise power (Dunne and Schmidt 2008, 100).

Neoclassical realism doubts that the power distribution can sufficiently explain the behaviour of countries. Instead neoclassical realism theory assumes that domestic factors also influence international relations. Dunne and Schmidt (2008, 99) argue that "*while systemic factors are recognized to be an important influence on the behaviour of states, so are factors such as the perceptions of state leaders, state-society relationships, and the motivation of states.*" Furthermore, the impact of these domestic factors on a states behaviour depends on the state's capacity to deal with these influences. Thus, in neoclassical theory, not all countries have the same starting point in power politics (Dunne and Schmidt 2008, 99). Nevertheless, the state remains the central actor in international behaviour, "*has expanded its power to effectively manage the process of globalization*" (Lamy 2008, 136) and thinks beyond the short-term effects of actions. By considering the possible negative consequences of actions such as trade retaliation on the domestic economy, states adapt their actions to ensure power beyond the immediate future (Watson 2014, 32).

Applied to trade, realism generally assumes that states act based on their national interests and out of a competitive trade understanding where each country tries to optimise its exports and imports (Cohn 2016, 169). Hereby, countries operate based on economic rationales, compare their cost and benefits (Frieden and Lake 2003b, 12), and are focused on the relative gains in trade negotiations (Hasenclever, Mayer, and Rittberger 2000, 6). Power relations drive a states behaviour and in the case of neoclassical realism can be influenced by domestic constraints. Correspondingly, the role of multilateral institutions is limited as they are only relevant as long as they represent the interest of the state (Cohn 2016, 89).

In relation to IPRs in PTAs, there are no explicit assumptions of realism, yet it can be assumed that realism would expect countries to maximise their power by including stringent IPR provisions that reflect and protect the domestic interests. Hereby, the weaker party to an agreement would be assumed to surrender to the stronger party due to the power imbalance. Drezner (2009, 67), for example, argues that "*negotiating the myriad global governance structures and treaties requires considerable amounts of legal training and technical expertise related to the issue area at hand. Although these transaction costs might seem trivial to great powers with large bureaucracies, specialized human capital is a relatively scarce resource in much of the developing world*." Intellectual property rights are one of these areas, where expertise is required and is therefore cost-intensive, which gives more powerful countries an advantage over less powerful countries in

PTA negotiations. Additionally to power relations, the inclusion of IPRs in PTAs could be influenced by domestic political factors following the neoclassical argument. However, countries might also prefer to regulate IPRs through other fora then PTAs, depending on which forum better represents their domestic interests.

2.2.2.2 Liberalism

Liberalism is based on the economic liberal theory, that roughly can be divided into three main strands: the *orthodox liberals* alias the Chicago School including the ideas of John Locke, Adam Smith, David Ricardo and Milton Friedman, the *interventionist liberals* including the ideas of John Stuart Mills, John Maynard Keynes and Joseph Stiglitz, and the more recent *institutional liberals* (Allen 2011, 11; Cohn 2016, 77 et seqq.).

Orthodox liberals propose that countries should intervene and regulate as little as possible as the free market provides the optimal self-regulation conditions for efficient economic outputs. *Interventionist liberals* see a need for the state to intervene and regulate where necessary to secure stability and ensure economic efficiency as well as political and social objectives (Allen 2011, 11; Cohn 2016, 77 et seqq.). *Institutional liberals* also support a free market, yet same as the interventionist liberalist see the need for regulatory intervention and hereby "*favor strong international institutions such as the WTO, IMF, and World Bank*" (Cohn 2016, 78).

Depending on the liberal standpoint in GPE, states are thus seen as a tool for interests to develop or additionally as regulators to correct certain market inefficiencies such as unemployment (Cohn 2016, 78). While *orthodox liberalists* argue that the markets should be as free from regulation as possible, *interventionist liberals* argue that states are to a certain degree required to regulate to ensure competition in the market. In any case, the state focuses more on the system of states interaction than merely on its domestic interests. For example, liberalism assumes that states do not only consider the immediate gains of a trade agreement to the own domestic market but to the trade system overall and over time. Thus, realism focuses on the state, whereas liberalism focuses on the interdependence between states (Hasenclever, Mayer, and Rittberger 2000, 6).

At the core of liberalism in GPE theory lies the assumption that states are interdependent and trade is perceived as a positive-sum game that is beneficial to all countries. This is based on game theory and the prisoners' dilemma situation, where both prisoners are better off if they cooperate than if they act unilaterally (Cohn 2016, 85 et seqq.). The situation can also be applied to trade theory, where according to the liberal rationale, both countries are better off cooperating through an agreement than for example unilaterally increasing tariffs. By engaging in international relations, countries can thus improve the conditions of all involved actors (Cohn 2016, 169). Unlike in realism, where the key influence on regime formation such as trade agreements are power relationships, in liberalism, the formation of trade agreements can be explained by interest constellations. Although actors are also seen as rational actors, they aim to maximise the absolute gains, whereas realism argues for relative gains as motivators (Hasenclever, Mayer, and Rittberger 2000, 6). In liberalism, states are thus seen as facilitators of international relations for their domestic actors (see Cohn 2016, 80). Furthermore, *institutional liberals* see clear advantages of regulating certain areas through multilateral institutions, whereas realists see the benefit of institutions only as long as they reflect the domestic interests (Cohn 2016, 89).

Based on liberalism theories and their recognition of PTAs as important tool in international relations, I would assume that countries aim to avoid market failure of IPRs and therefore would regulate IPRs through PTAs. Yet not in general, i.e. in each of their trade agreements, but targeted, i.e. in PTAs with those countries that share their interests in IPR protection. Based on this interest constellation assumption of liberalism, countries could also prefer more specialised fora of IPR regulation to PTAs such as IPR specific agreements (see *Figure 5: Fora of IPR Regulation*). Especially, if countries act according to the institutional liberal argument and prefer strong multilateral institutions. Therefore, PTAs could also include no references to IPRs or merely be used to reinforce other fora, for example, by requiring accession to IPR conventions or reaffirming them.

2.2.2.3 Social-constructivism

Social-constructivism is based on ideas by Immanuel Kant, yet emerged as a GPE theory only later in the 1980ie as a reaction to the perceived shortcoming of the existing realist, liberalist and marxist GPE theories explaining international relations. Social-constructivism opposes the idea that countries are mere rational actors and assumes instead that countries are contextually embedded and influenced by normative factors such as their history, ideas, knowledge, values, norms and identities. Cohn (2016, 116) names as an example for constructivism the concept of the gross domestic product (GDP), that "*seem to be a "material fact" that measures the output of goods and services, it is also a "social fact," because shared values determine what is included and not included.*

Whereas goods and services with market values are included in the GDP, economic activities within households are excluded." Constructivism revaluates what other theories might accept as facts and explains international relations using social contextual factors. The social environment constructs the choices of countries, for example, where leading experts take a unified position, they can alter countries preferences (Cohn 2016, 115). As an illustrative example for the influence of ideology on the global political economy, one could imagine the different impact on the global political economy if states are led by either Mahatma Gandhi or Osama Bin Laden (Barnett 2008, 164).

In social-constructivism, states are seen as agents that can influence the international structure, yet the international structure can also alter countries perception of itself and its norms (Cohn 2016, 114). Barnett (2008) shows how these assumptions of social-constructivism can explain changes in the structure of the global political economy:

> "*Although the structure of the cold war seemingly locked the United States and the Soviet Union into a fight to the death, leaders on both sides creatively transformed their relations and, with it, the very structure of global politics."* Barnett (2008, 163)

The meta-theoretical orientation of social-constructivism is sociological and not based on absolute rational actions, rather actions are rationality bound by the social context of its actors. Therefore, states act not to achieve a certain rational goal such as protecting domestic producers, but rather act to represent a particular ideal (Barnett 2008, 162; Hasenclever, Mayer, and Rittberger 2000, 6). Barnett (2008, 163) describes this as actors following a logic of appropriateness, i.e. acting based on legitimacy concerns, instead of a logic of consequences, i.e. acting based on a cost-benefit analysis. Unlike power relations in realism, and interest constellations in liberalism, social-constructivism postulates that trade agreements are formed based on shared ideas, knowledge dynamics and communication. When states thus decide to enter into a trade agreement, it is likely that they share the norms of their trading partners.

For IPRs in PTAs, this could mean that specific countries or even regions are embedded in a similar social context and therefore have shared approaches in IPR regulation. Again, a common assumption therefore is the north-south divide, where developing countries are anticipated to support a minimal IPR standard and developed countries a maximum IPR standard (see *2.2.1.3 Rationale of IPRs in PTAs*). Furthermore, it suggests that countries are conscious about trading partners with opposing views on IPRs and might either only agree on general IPR provisions with these partners, or even prefer to enter into PTAs only with those trading partners that share their IPR ideals.

2.2.2.4 Modern Marxism

The ideas of modern marxism theories stems from marxism theory, the debate of the struggle of classes defined by the cleavage between labour and capital, and are based on the works of Karl Marx (Frieden and Lake 2003b, 10). In marxism, politics and the economy are defined by classes, i.e. "*an exploiting nonproducing class and an exploited class of producers*" (Cohn 2016, 103). The state is seen as a representation of the capital that enables the exploitation of labour. Only by eliminating the divide among classes, the state will represent all its inhabitants (Cohn 2016, 104). Marxism focuses on country-internal classes, and only marginally explains international relations. It is aware of the systemic perspective and categories countries into capitalism versus socialism along the divide of capital and labour, yet the international perspectives mostly argue that both ideologies want to enforce a systemic change towards their ideals (Hobden and Jones 2008, 146–47).

Based on marxism, many modern theories adding to marxism and for example trying to explain international relations developed such as the *dependency theory*, the *world-systems theory*, and *neo-marxism* (see Cohn 2016, 149 et seqq. see Hobden and Jones 2008, 108 et seqq.).

Besides marxism, *dependency theory* is also based on Latin American structuralism developed amongst others by Raul Prebisch (Cohn 2016, 108). The key argument of dependency theory is that southern countries depend on northern countries more than vice versa because primary goods are predominately produced in southern countries and are more easily substitutable than finished goods, which are primarily produced in northern countries. Thus whereas marxism focused on the division of labour versus capital, the dependency theory sees the cleavage between core and peripheral states, or as Frieden and Lake (2003b, 11) state: "*the global system is stratified into a wealthy area (the "core," or First World) and a region of oppression and poverty (the "periphery," or Third World). International capitalism, in this [marxist] view, exploits the periphery and benefits the core, just as capitalists exploit workers within a single country."* The dependency of southern countries gives northern countries the upper hand and tilts the balance towards the developed countries even more, especially since northern countries have no benefits of changing the system. Dependency theory thus subsumes that developed countries have no interest in assisting southern countries in their development process (Cohn 2016, 109).

The *world-system theory* has been developed most prominently by Immanuel Wallerstein (Hobden and Jones 2008, 147 et seqq.) and like the dependency theory, it focuses on the relationship between "core" and "peripheral" states, yet defines them more broadly. In the world-system theory, core states are democratic regimes that import raw materials, export manufactured goods, provide welfare services and provide high wages, whereas peripheral states are the exact opposite on each of these factors. However, there is a third category of states, which are called semi-peripheral states. These semi-peripheral states have authoritarian governments, export and import manufactured goods as well as raw materials, have low wages and low welfare services (Hobden and Jones 2008, fig. 8.2). The key driver of the international system according to the world-system theory is capitalism and similar to the dependency theory, the assumption of the world-system theory is that the core states benefit more than the other states, and that over time the discrepancy between core and peripheral states steadily increases (Hobden and Jones 2008, 148–49).

Neo-marxism is the theory most closely relying on marxism and has been most prominently developed by Justin Rosenberg and Benno Teschke (Hobden and Jones 2008, 155). *Rosenberg* argues that realism so far has left out the historical context in explaining international relations, and the development of world politics cannot be explaining without considering the social context. According to Rosenberg, the relationship between states can be derived from the relations of production such as the relationship between production ownership and production manufacturers – capital and labour (Hobden and Jones 2008, 155). *Teschke*, on the other hand, states that international relations can best be described by looking at the social property relations, i.e. adding to the production relation the analysis of the "*forms of exploitation, and control of the means of production*" (Hobden and Jones 2008, 156).

All of these forms of modern marxism assume that countries are clearly divided in their constitutional core and that this impacts their international relations. As seen in *2.2.1.3 Rationale of IPRs in PTAs*, the divide of interest into north and south made by dependency theory is a reoccurring argument to explain why countries include IPRs in PTAs. It might, therefore, be that stringent IPRs are predominately found in PTAs between northern and southern countries. Furthermore, the argument has been raised that

IPR producers are those that press for the inclusion of stringent IPR provisions, which would fall in line with the argument of the world-system theory. Hereby, it can be argued that the core, IPR producing countries use their power to protect IPR through PTAs abroad and thereby expand their lead in IPR production. Also, based on neo-marxism, the domestic situation of the production of IPR could influence IPRs in PTAs.

GPE theories thus provide a multitude of possible explanations how and why countries choose to include IPRs in PTAs. Previous research has already tested some of these assumptions, yet so far has been inconclusive on what are the drivers behind IPRs in PTAs. With the clear and comprehensive mapping of IPR in PTAs, this doctoral thesis will provide some needed insight into countries preferences and IPR regulation approaches. But first, the next subchapters will recap the previous research on IPRs in PTAs and lay out the overarching research questions.

2.3 Previous Research on IPRs in PTAs

In the last few decades, there was an increase in research in preferential trade agreement as the number of PTAs has increased immensely (Acharya et al. 2011). This, in turn, led to a heightened interest for PTAs from both policymakers as well as academia. IPRs in PTAs have entered the spotlight after TRIPS came into force in 1995, due to the fact that allegedly many subsequent PTAs also included provisions on IPRs. So far, there have been different approaches to make the recent developments visible. For a long time, the tendency was for legal scholars to look at the IPR content and legal implications of specific agreements and compare for example PTAs of a single country or a specific region. Economic scholars on the other hand often focused on the effects of IPRs in PTAs by either taking one specific PTA or strongly simplifying the IPR content for multiple PTAs for a broader effect analysis. The following section gives an overview of the previous research on IPRs in PTAs that can roughly be categories into three categories: descriptive studies, systematic studies with a small case selection, and systematic, comprehensive studies.

Most of the previous research falls into the first category and consists of descriptive studies. Shortly after NAFTA came into force, Maskus (1997) analysed the diverging implications of the multilateral approach by the WTO, i.e. TRIPS signed in 1994, and a preferential agreement, i.e. NAFTA signed in 1992. He saw the PTA approach of IPR regulation as implementing more stringent IPR protection compared to the WTO approach. This line of argumentation was followed by many other scholars, that often compared the IPR content of PTAs to the TRIPS agreement.

Most descriptive studies looked at the IPR content of a single PTA or multiple PTAs of one country, draw comparisons to TRIPS or looked at specific issue areas such as access to medicine. For example, Kang and Stone (2005) focused on the IPR provisions of the trade agreement between Singapore and the US signed in 2003, which was the first US trade agreement with an Asian country. The authors found that the PTA substantially increased the IPR protection for all forms of IPR and were especially stringent for copyright. Furthermore, the PTA also increased the regulation on IPR enforcement compared to the TRIPS provisions. Price (2004, 848) looked at the Bahrain-US PTA signed in 2004, noticed the stringent IPR regulations and remarked that the enforcement mechanisms were seen as representing US interests and going against the market interest of Bahrain and that Bahrain might lack the necessary resources to enforce such detailed IPR provisions. In the same year, Roffe (2004) analysed the Chile-US PTA signed in 2003 for TRIPS-plus provisions, i.e. provisions that go beyond the TRIPS agreement (see *3.1.2.5 TRIPS-plus Variables (T+PTAs dataset)*). He stated that the agreement does not regulate IPRs as stringently as other US PTAs with Singapore or Bahrain, but that it set a more stringent standard on certain provisions that most likely would serve as a precedent for future PTAs (Roffe 2004, 49). Correa (2004b) also took a closer look at the Chile-US agreement and focused on the public health framework in it. He compared it to the US PTA with Jordan that he determined to be much more stringent on IPRs, and to the US PTA with Singapore, that he saw on a comparably stringent level as the one with Chile. Correa (2004b, 8) argued that the agreement comes with negative effects for Chile's public health sector and unlike Singapore, Chile has not the necessary economic development to *"face the costs derived from higher levels of protection"*.

In the same year Correa (2004a, 352) also published an analysis of the effect of IPR regulations in BITs and PTAs on the issuing of compulsory licenses and highlighted that at least theoretically the inclusion of IPR in the investment definition could be used as leverage by IPR holders against countries thinking about issuing a compulsory license. Drahos (2003) analysed the US approach and fora shift from bilateral, to regional, multilateral and back towards a bilateral approach, subsuming it as a cycle of alternating fora of IPR regulation, depending on which forum is most efficient in reflecting the US domestic interests. Abbott (2006) also focused on the US approach of IPR regulation through PTAs and concluded that the stringent regulations on IPR might overthrow the welfare balance into the detriment of the public both in PTA member as well as the US market. One of the US PTAs often referred to as a template in regards to IPR regulation is the Jordan-US agreement signed in 2000. Malkawi (2006) found in his analysis of the Jordan-US PTA, that the agreement should not serve as a template, at least in regard to Arab countries, as it is too stringent for certain aspects with a negative impact on the Jordan market and lacks certain forms of IPRs such as traditional knowledge which would be beneficiary for the Jordan. He saw the main shortcoming in the lack of provisions on the dissemination and transfer of technologies (Malkawi 2006). El-Said and El-Said (2007) looked at the same agreement, yet from the angle of TRIPS-plus provisions and their effect on the access to medicines. They showed that the benefits of the PTA for Jordan were over-, and the costs underestimated, especially regarding the access to medicines.

Bernieri (2006) also looked at US PTAs and focused on their anticipated effects on Latin America, and briefly compared it to the regulation approach by the EU. In the diverse approaches of IPR regulation by the EU and US, she saw a possible risk of fragmentation in IPR regulation. Seuba and Garcia (2010) analysed the agreement between the EU, Colombia and Peru before it was signed in 2012, and found that it includes IPR provisions that are more stringent on enforcement than Colombia and Peru have agreed to in their agreements with the US. Furthermore, they found that there are substantial changes from the initial IPR proposal made by the EU towards the final negotiation round, suggesting that Colombia and Peru were able to influence the IPR chapter in their favour. Roffe and Spennemann (2014) analysed mainly US PTAs and described specific cases where PTAs go beyond TRIPS regulation such as the extension of the patent term protection or the restriction of circumventions for technological measures (copyright).

Biadgleng and Maur (2011) focused on US and EU PTAs and analysed how their IPR provisions are implemented into domestic law in developing countries. They found that the implementation poses a problem for developing countries for example due to the extent that changes or creations of IPR regulations take in an environment with less established and otherwise preoccupied administrative capacity (Biadgleng and Maur 2011, 26). As shown above, the descriptive analysis of IPRs in PTAs are tilted towards analysing US PTAs and comparing their content to TRIPS or in some more recent studies to other US PTAs or even non-US PTAs. In order to generate more generally applicable and universal stands on how IPRs are being regulated through PTAs and how their effects might vary, it is beneficial to take a more systematic approach.

More recently, there have also been systematic studies with a small case selection, i.e. comparing IPR provisions in PTAs according to a specific list of provisions that are applied to all PTAs. For example, Fink and Reichenmiller (2005) systematically compared recent US PTAs on their TRIPS-plus provisions on patents, copyrights and enforcement, and found that the there exists a US template, yet it is not entirely fixed, and there are adaptions based on the trading partners. Roffe et al. (2007) focused on the element of technical assistance in the area of IPRs in PTAs and coded ten TRIPS-plus provisions across five US PTAs. They found that developing countries cannot be expected to bear the costs of implementing and enforcing such stringent IPR provisions alone and that IPRs should leave enough room for "*dynamic competition through the acquisition and local development of technology in an environment that is conducive to growth*" (Roffe, Vivas, and Vea 2007, 13). Krikorian and Szymkowiak (2007) conducted a text analysis of patents and data protection in 14 US PTAs and compared it to TRIPS and among the PTA sample. They showed an evolution of ever more stringent IPR regulation through PTAs and a clear US strategy of IPR regulation. Also, Cottier et al. (2015) systematically analysed CAFTA signed in 2004, CETA signed in 2014, and TPP signed in 2015, for TRIPS-plus provisions for copyrights, GIs, trademarks and patents, and found that all three PTAs include more stringent IPR provisions than TRIPS. These studies are interesting as they allow going into detail about specific IPR regulations in PTAs as well as comparing them to one another. However, they also fall short on painting a holistic picture of the current situation of IPRs in PTAs.

There are also a handful of systematic and comprehensive analyses, i.e. studies that cover more PTAs than just the ones of a specific country and include more than a few IPR provisions. The UNCTAD International Investment Arrangement Monitor (2007) analysed 158 PTAs and concluded that more than half of them include TRIPS-plus provisions and thus show a move towards a maximum IPR standard. The monitor showed that the US and EU PTAs are substantially different, as the US PTAs include highly specific IPR regulation dedicating entire chapters to IPR, whilst the EU PTAs have a less consistent approach and sometimes include only limited provisions (United Nations Conference on Trade and Development (UNCTAD) 2007, 6). Lindstrom (2010) examined the TRIPS-plus content of almost 100 PTAs in the Asia-Pacific region and argued that this form of regulating IPRs is not ideal. She showed her comparison of PTAs from the

US, EFTA (i.e. the trade association of Iceland, Liechtenstein, Norway and Switzerland) and Japan with Asian-Pacific countries, and found that the US includes the most comprehensive IPR provisions, PTAs with Japan are far less extensive, yet centrally feature protection for new plant varieties, and EFTA mostly includes accession requirements to IPR conventions in their PTAs (Lindstrom 2010, 928). Seuba (2013) examined the IPR content of 256 PTAs and focused on the IPR forms of copyright, patents, trademarks, industrial designs, geographical indications and undisclosed information, as well as provisions on IPR enforcement divided into the categories of civil, criminal, digital and border enforcement. He found that more than 55% of all analysed PTAs regulate IPRs substantially yet with a broad diversity on how specific IPRs are regulated (Seuba 2013, 251 et seqq.).

The most substantive analysis of IPRs in PTAs has been conducted by Valdés and Tavengwa (2012) and the revised version of the same study by Valdés and McCann (2014). Their report for the WTO represents the first systematic and comprehensive dataset on IPRs in PTAs freely available. Valdés and Tavengwa (2012) coded 195 PTAs for 30 IPR provisions consistent of eight general IPR provisions such as MFN treatment or border measures for IPRs, as well as eleven IPR forms mentioned in PTAs, and eleven specific pharma-related provisions such as patenting of life forms or compulsory licensing. In the revised and updated version, Valdés and McCann (2014) extended the coding to a total of 245 PTAs and added one new variable on investment-related IPRs and one on dispute-settlement for non-violation claims. Their data proofed that the number of PTAs including IPR provision has accelerated, especially after TRIPS entered into force in 1995, and they found that the number of IPR provision varies widely across PTAs with covering mostly general and less often also specific IPR provisions. Furthermore, they identified three main countries that most often include a more stringent level of IPR protection: the US, EU, and EFTA. According to Valdés and McCann (2014), there is an IPR convergence in those countries having joined a PTAs with one of these three countries.

As shown above, there already exists substantive research on IPRs in PTAs, yet so far there is a lack of a genuinely comprehensive dataset. So far, the most extensive dataset covers 245 PTAs, yet according to Dür et al. (2014) over 700 PTAs have already been concluded. The most extensive dataset on IPRs in PTAs thus only covers around a third of all PTAs. Furthermore, as the variety of previous research shows, there is much more IPR content in PTAs than could be covered by 32 variables. My dataset thus strongly relies on the previous research and extends to fill those gaps for example regarding the inclusion of IPR conventions in PTA and more detailed enforcement mechanisms. Before going into detail about the dataset (*Chapter 3: Dataset on Intellectual Property Rights in PTAs*), the following subchapters provides an overview of the overarching research questions that are at the core of this study.

2.4 Overarching Research Questions

Based on the previous research and the rationales behind IPRs in PTAs, this study sets out to shed some light on three main questions briefly described in the next paragraphs. The chapters are structured following those four research questions.

Firstly, what is the state of play? The primary gap in previous research on intellectual property rights in preferential trade agreements is that there is no systematic, comprehensive data on IPRs in PTAs. To answer the first question, I created a dataset including 86 coded IPR provisions for over 700 PTAs that encompasses general IPR coding such as MFN requirements, the scope of the eleven different forms of IPR (*Table 1*) found in PTAs, their enforcement mechanisms and the multilateral IPR coherence of PTAs by including IPR-related treaties referenced in them. *Chapter 3: Dataset on Intellectual Property Rights in PTAs* describes the making of the dataset, the content and methodology, and presents descriptive statistics. The dataset on IPRs in PTAs has led to several follow-up datasets that allow the analysis of the overarching research questions. Depending on the focus in question, the data has been transformed and enhanced.

Secondly, what can explain the status quo? After creating the dataset, it becomes visible how countries regulate IPRs through PTAs. The dataset makes it possible to take a closer look at the design of IPRs in PTAs and compare what countries include, at what time and with which PTA-partners. This allows for a broader analysis of countries rationale to enter PTAs including varying degrees of IPR provisions. *Chapter 4:* thus analyses possible explanations for the variation in the design of IPRs in PTAs.

Thirdly, does it matter? The big question with IPRs, in general, is if they have the intended impact. As seen in *2.2.1.2 Rationale of IPRs*, IPRs are associated with a bundle of positive effects, whereas the effects of IPRs in PTAs are seen ambiguously (*2.2.1.3 Rationale of IPRs in PTAs*). Furthermore, there have been questions if developing countries have the administrative capacity to implement the IPR standards agreed to in PTAs. It is hence essential to look at the effects of IPRs in PTAs. *Chapter 5: Effects of Intellectual Property Rights in PTAs* looks at the legal and economic effects of IPRs in PTAs and analyses if there are any changes from the pre-PTA to the post-PTA status.

These overarching research questions are analysed by looking at the previous research on IPRs in PTAs, combining them with the political science methodology of data collection and an interdisciplinary approach of PTA content analysis. The next chapter will begin by introducing the fundament of this research: the dataset.

Chapter 3: Dataset on Intellectual Property Rights in PTAs

This chapter addresses the creation and content of the dataset on IPRs in PTAs constructed in the process of this PhD. The dataset covers 86 IPR variables for 724 PTAs (see *Appendix 2: Codebook of IPRs in PTAs Dataset* for the complete codebook). Additionally, I coded 90 TRIPS-plus variables in collaboration with Jean-Frédéric Morin (Université Laval, Canada), which compose our T+PTA dataset (see *Appendix 3: Codebook of T+PTA Dataset* for the entire codebook). My research enhances the case selection and extends the coding scheme on IPRs compared to previous research. This allows a systematic and comprehensive analysis of IPRs in PTAs for example in regard to global developments, the development over time, various forms of IPR, IPR enforcement, references to other IPR regulations such as IPR conventions or IPR-related conventions, and TRIPS-plus provisions.

The first part of this chapter is dedicated to the selection of PTAs and IPR variables. Here, I explain which previous research served as a source and how the variables selection for the IPR provisions developed and how the variables were operationalised. The second part describes the different coding steps, from preprocessing to the codebook and dataset, as well as the indexes developed, and the validity and reliability checks performed. In the third part of this chapter, I illustrate some of the key findings of the dataset and elaborate on selective descriptive statistics to show the situation of IPR regulation through PTAs.

3.1 PTAs and IPR Variables Selection

When analysing intellectual property and trade agreements, there are varying definitions in use. Some talk about IPRs yet only refer to copyrights, patents or trademarks, and others refer to trade agreements whilst excluding multilateral agreements or agreements not notified to the WTO. The research aims to be as comprehensive as possible whilst remaining focused on capturing IPRs in PTAs.

In the course of preparing a comprehensive dataset on intellectual properties in preferential trade agreements, I analysed other datasets on IPRs, PTAs as well as IPRs in PTAs. In the subsequent sections, I will describe the development of my dataset in more detail by elaborating on the PTAs used and the IPR variable selection process.

3.1.1 Selection of Preferential Trade Agreements

The selection of PTAs is based on the Design of Trade Agreements Dataset (DESTA), which is one of the most comprehensive datasets on trade agreements (Dür, Baccini, and Elsig 2014). Using DESTA instead of other trade agreement databases is a huge advantage as DESTA includes far more relevant PTAs than other datasets. In previous studies, researchers mostly relied on the WTO to determine which PTAs to code. The WTO provides two databases on trade agreements: one for RTAs and the other one for PTAs. As described in the terminology section for PTAs (*2.1.1 Preferential Trade Agreements (PTAs)*), the WTO used to have a different definition of PTAs that does not fit the commonly used terminology and instead of capturing preferential trade agreements mostly focuses on GSPs. Most previous research thus does not draw on the WTO PTA database, but the other WTO database on RTAs, which includes 287 agreements that are currently in force and notified to the WTO (World Trade Organization 2018). DESTA builds on the WTO database, but goes further and includes over 700 PTAs.

According to the DESTA codebook's explanatory notes, DESTA includes "*all agreements that have the potential to liberalize trade. Partial scope agreements thus are included as soon as they liberalize at least some trade, whereas framework agreements (with very few exceptions), trade and cooperation agreements, etc. are excluded*" ("Explanatory Notes" on DESTA 2017). DESTA also includes agreements that are no longer in force, for example, if they have been replaced by an updated version such as TPP that was signed, never entered into force and was replaced by CPTPP; or versions of the same PTAs that have had changed in the legal text in the course of accessions such as the Central European Free Trade Agreement (CEFTA) for the accession of Slovenia, Romania, Bulgaria and Croatia. DESTA has no language border and predominantly includes trade agreements in English, followed by PTAs in Spanish, very few in Arabic, French or German. With its broad range, DESTA is ideal to establish a comprehensive dataset on IPRs in PTAs.

For the different parts of the analysis, I will draw upon different PTA dates. Briefly stated, PTAs have three main categories of dates that are relevant for my analysis: the signature date, the ratification date and the date of entry into force (see Niebruegge 2007). After the treaty negotiations between representative delegations of the treaty members are concluded, a state representative such as the minister of foreign affairs signs the PTA. The signature date shows when a treaty was signed and indicates the willingness of a state to comply with the treaty text. Yet in order for the treaty to become binding, it has to be ratified according to the domestic legislation, i.e. parliament ratification (e.g. in the Netherlands), parliament consent and presidential ratification (e.g. in the US it needs the consent by the Senate), ratification by the Federal Council (e.g. in Switzerland it needs the consent by parliament) or the dual ratification of parliament and president (e.g. in India). The treaty only becomes binding after the ratification date. The time in-between signature and ratification date is often used to establish and adjust the domestic legal framework to match the obligations of the PTA and gain domestic political support for the signed PTA in order to ensure actual ratification. One prominent recent example is the TPP agreement. This multilateral agreement was signed by the US and eleven other states, yet after the alteration in the oval office of the US, it lost support, the signature of the USA was withdrawn, and TPP will not be ratified by the US.

Whereas the signature date shows the *intention* to be bound by a treaty and the ratification date states the legal *obligation* to be bound by it, the date of entry into force marks the effective date from when on the obligations become *legally binding* (Niebruegge 2007, 355). There is no universal rule on how the date of entry into force of a PTA is set. It can be bound directly to the ratification date; a critical number of ratifications of the PTA by PTA members; connected to an exchange of notifications; based on a predefined elapsed period; or a specific date in the calendar year such as the 1st of a month. For some treaties, a considerable time passes in-between the signature date and date of entry into force, whereas others sign, ratify, and put a PTA into force in next to no time.

Each date – signature, ratification, entry into force – has different implications, and for my research, I focus on the date of signature and entry into force. For the effect analysis, I will use the date of entry into force as not all treaties, which were signed also entered into force (yet) and the effects can only be measured after the PTA actually moves from intention to a binding legal obligation.

Even though my PTA selection is based on DESTA, my IPRs in PTAs dataset includes some deviations from the most current DESTA version, as I started coding IPRs in PTAs in 2014 with the DESTA version of said year. Over time, DESTA has further developed and improved the PTA selection. I have adopted my codebook to match the most current DESTA version, where there were new PTAs or changes to existing PTAs. Yet there were also some PTAs that in hindsight were dropped from DESTA because they did not match the DESTA definition of PTAs any longer. At that point, I had already coded those PTAs for IPRs and decided to keep those PTAs within my dataset even if they were not included in DESTA anymore. This concerns 26 PTAs, from 1955 until 2014, and all of them are identifiable within my IPR in PTAs dataset by the variable DESTA ID set to *'X'*. *Table 5* shows the 26 PTAs that were dropped from DESTA over time, yet are coded for IPRs within my dataset.

Table 5: PTAs Divergent from DESTA

PTAs included in IPRs in PTAs dataset, dropped from DESTA until July 2018	**Year of Signature**
Argentina Mexico Additional Protocol to MERCOSUR-Mexico agreement	2002
Australia Federation of Rhodesia and Nyasaland	1955
Cameroon EU	2009
Bangladesh India	2006
Cross-Straits Economic Cooperation Framework Agreement (ECFA)	2010
Compact of Free Association Marshall Islands I	1983
Compact of Free Association Marshall Islands II	2003
Compact of Free Association Micronesia I	1982
Compact of Free Association Palau	1986
EU Fiji Papua New Guinea	2007
EU Maastricht (25) Enlargement	2003
EU Maastricht (27) Enlargement	2005
EU Maastricht (28) Enlargement	2011
EU Nice (28) Enlargement	2011
EU PLO	1997
EFTA PLO	1998
PLO Turkey	2004
Indonesia Pakistan	2012
Compact of Free Association Micronesia II	2003
Eastern and Southern African States Interim (ESASI) EU EPA	2009
EU Iraq	2012
Economic Cooperation Organization (ECO) (Treaty of Izmir revised)	1996
Economic Cooperation Organization (ECO) (Treaty of Izmir)	1977
Pacific Alliance Additional Protocol	2014
Portugal Federation of Rhodesia and Nyasaland	1958
South Africa Federation of Rhodesia and Nyasaland	1955

These PTAs were excluded from DESTA for various reasons. For example, they are interim agreements such as the PTAs with the Palestinian Authority, or PTAs with tiny islands as member states such as the Marshall Islands or Tuvalu (see "Explanatory notes" on DESTA 2017). I kept them in the IPRs in PTAs dataset as I had already coded them for IPRs. In general, I will not include them in the analysis as they were dropped from DESTA due to eligible justifications. For illustrative purposes, they are included in some of the descriptive tables as well as the codebook, however, always in comparison to the data without them.

My dataset on IPRs in PTAs thus includes 724 PTAs, respectively 698 PTAs without the dropped PTAs. For the TRIPS-plus variables, the coding of only one PTA is dropped, namely the TRIPS-plus provisions of *EU Maastricht (28) Enlargement* agreement signed in 2011. My dataset includes 435 bilateral PTAs and 289 multilateral ones (more than two member countries) out of the 724 coded agreements, respectively 425 bilateral PTAs and 273 multilateral ones out of the 698 agreements used for the analysis. *Table 6* shows the distribution of the PTAs within my dataset using the regional classifications of north-north (NN), north-south (NS) and south-south (SS) PTAs and the intra- and intercontinental categories provided in DESTA (Dür, Baccini, and Elsig 2014). It shows that PTAs go well beyond a broad regional scope (221/206 are intercontinental) and that a majority of PTAs have been signed without the Northern countries being involved (458/448 are SS). An overview of the number of PTAs per country covered by my dataset can be found in *Appendix 1: List of PTAs per Country*.

Table 6: Regional Classification of PTAs

Region	**PTAs**		**Description**
	724	**698**	
NN	58	54	North: Australia, Canada, Japan, New Zealand, US, Western European countries South: all other countries
NS	208	196	North: Australia, Canada, Japan, New Zealand, US, Western European countries South: all other countries
SS	458	448	North: Australia, Canada, Japan, New Zealand, US, Western European countries South: all other countries
Region only Africa	40	39	All PTA members are from Africa
Region only Americas	171	169	All PTA members are from the Americas
Region only Asia	85	81	All PTA members are from Asia
Region only Europe	199	195	All PTA members are from Europe
Region only Intercontinental	221	206	PTA members are from different continents
Region only Oceania	8	8	All PTA members are from Oceania

3.1.2 Variables on Intellectual Property Rights

For the selection of the IPR variables, I looked at the previous research and other datasets on IPRs in PTAs. My initial selection of variables is based on the dataset by the World Trade Organization by Valdés and Tavengwa (2012) and the revised version by Valdés and McCann (2014). Their dataset is highly systematic and is not exclusive towards certain IPR areas. So for my first coded PTAs, I used the same variables as Valdés and Tavengwa (2012) resp. Valdés and McCann (2014) and also coded the IPR variables previously included in DESTA.

After coding some agreements, I realised that the variable selection was not broad enough to reflect the actual content of PTAs. The thing with IPRs in PTAs is, that if there actually are IPR provisions within a PTA, the variation on their length, precision and content varies immensely. I thus started by reading and comparing several PTAs, and subsequently grouping their content into broad IPR categories. Overall, I identified five main categories: general IPR, IPR scope, IPR enforcement, IPR multilateral coherence and TRIPS-plus. In total, I coded 86 variables for the first four categories and another 90 for the TRIPS-plus category. The entire dataset includes besides the coded variables also calculated indexes and dummy variables, which will be discussed in the subchapter *3.2 Codebook and Dataset Development*. In the following subchapters, I will elaborate on each variable category and the selection process for the coded variables.

3.1.2.1 General IPR Variables

The general IPR category is a compound of various IPR variables. The aim of this category is to identify which PTAs include general IPR provisions and to what extent. For example, PTAs include IPRs not only in the general or a specific IPR section but also in the investment chapter. As those provisions in the investment chapter are not inherently on IPR, yet concern IPRs and might have wide-ranging implications, these variables are included in the general category. Concretely, the general IPR category includes the subsequent twelve coded variables:

Table 7: General IPR Variables (N=12)

Variable	**Description**
ipr_mentioned	Does the treaty mention IPRs?
ipr_mentioned_exception	Are IPRs mentioned as general exceptions in the agreement?
ipr_1_article	Is there an article specifically on IPRs?

Variable	Description
ipr_more_than_1_article	Are there more than one article specifically on IPRs?
ipr_word_count	What is the word count on IPR articles, chapters, and annexes?
ipr_mfn	Is most-favoured-nation treatment granted in relation to IPRs (without considering investment chapters)?
ipr_nt	Is national treatment (NT) granted in relation to IPRs (without considering investment chapters)?
ipr_as_investment	Are IPRs defined as investment?
ipr_investment_mfn	If IPR defined as investment: Is most-favoured-nation treatment granted in relation to IPRs in investment chapters?
ipr_investment_nt	If IPR defined as investment: Is national treatment granted in relation to IPRs in investment chapters?
ipr_assistance_coop_coordination	Is there assistance/cooperation/coordination agreed upon in relation to IPR?
ipr_transition_period	Is there a transition period agreed upon for accession to IPR provision (such as IPR agreements/conventions)?

First of all, it is essential to code if a PTA mentions IPRs at all (ipr_mentioned). Some PTAs have somewhere in the agreement in a subparagraph for example in the investment chapter IPR mentioned as an exception (ipr_mentioned_exception). In certain PTAs, this is the only place where IPRs are mentioned, and most likely the intention of these provisions is not to protect IPRs per se, especially as the exceptions usually entail IPRs being excluded from a certain regulation. Those exception provisions seem out of place and rather are due to copy-paste of previous PTAs than an intentional inclusion of IPRs. Those PTAs, where I only found this variable on IPRs being an exception, are not considered to include IPR provisions.

To quantify the content of IPRs in PTAs, I started coding when there was an article on IPRs (ipr_1_article) and when there was a chapter on IPRs. The latter has proven to be subjective, as the categories of articles and chapters vary across time and PTAs. What some PTAs label as an article, other call chapters. Therefore, I replaced said variable on IPR chapters by a variable coding if there is more than one article on IPRs (ipr_more_than_1 _article) and added a variable counting the number of words in the IPR provisions in PTAs (ipr_word_count). This variable does not include those sections, where IPR was only mentioned as an exception or where the IPR provision was in the investment chapter. Besides those agreements that have no IPR provisions, the word count ranges from 20 in the PTA between Jordan and Singapore signed in 2004, to 56’242 words in PTA between the EU and Ukraine signed in 2014, which indicates how much the regulation of IPRs in PTAs can vary across PTAs.

Two other general variables are the ones on the MFN (ipr_mfn) and national treatment (ipr_nt) granted in the IPR section of a PTA. After 1994, these variables are a mere repetition of TRIPS for those countries already members to TRIPS. Nevertheless, they are a common feature in the IPR section of PTAs. As stated above, I also coded if intellectual property is defined as investment (ipr_as_investment) and ipso facto also if MFN and NT are granted for investment (ipr_investment_mfn resp. ipr_investment_nt).

Some PTAs also include general statements to assist each other, cooperate and coordinate about IPR regulation (ipr_assistance_coop_coordination) or grant special transitional periods for certain IPR provisions, i.e. additional time until resp. a specific point in time when the IPR provisions need to enter into force (ipr_transition_period). The latter has also been included in TRIPS, where developed countries had to comply with TRIPS by 1 January 1996, developing countries were granted transitional periods until 2000 (with additional transition period for new patent products), and LDCs until 2006 (with possible additional transition periods). The maximum transition period granted for IPRs in PTAs was thirteen years in the CARIFORUM EU agreement signed in 2008 (Article 140 lit. b).

The dataset also includes a category for specific IPR variables, but this category does not include uniquely coded variables. It consists of an index created out of scope and enforcement variables that are categorised as specific. This index will be elaborated further in the subchapter *3.2 Codebook and Dataset Development*.

3.1.2.2 IPR Scope Variables

After coding the general variables, I was looking for a way to code the scope of IPRs in PTAs, i.e. how many IPR areas are covered in a PTA. The aim here is not to evaluate the content but rather to take score of which areas are covered by IPRs (see *Table 1: Forms of IPR*). Hereby, I relied on the IPR areas identified by Valdés and Tavengwa (2012) respectively Valdés and McCann (2014), that also reflect the eleven IPR categories I found in PTAs: copyrights, trademarks, geographical indications (GIs), industrial design, patents, undisclosed information, layout-designs of integrated circuits, new plant varieties, traditional knowledge and genetic resources (TK & GR), encrypted-program-carrying satellites, and domain names (for more detailed information on these areas see *2.1.2 Intellectual Property Rights (IPRs)*).

PTAs differ regarding their scope of IPR areas and as well as how these areas are covered. Whilst some simply mention which areas of IPR are included, e.g. in their definition of IPRs or make general statements on IPR areas, other PTAs include tangible and detailed provisions for several IPR areas. To reflect this nuance, I coded each area of IPR twice: once as *IPR scope mentioned* (m) and once as *IPR scope tangible* (t).

Example for IPR Scope Mentioned (m)
Singapore Taiwan 2013
Chapter 13 Article 13.1
1. The Parties, recognising the importance of intellectual property as a factor of each Party's economic competitiveness in the global economy, undertake to develop and promote mutually beneficial cooperation between the Parties in this area.
2. Recalling the contributions achieved in the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights, the areas of the cooperation may include:

> *(a) copyright and related rights, trademarks, geographical indications, industrial designs, patents, layout-designs (topographies) of integrated circuits, protection of undisclosed information, and control of anti-competitive practices in contractual licences;*
> *[…]*

In some cases, the mentioned IPR scope is listed in a definition such as in the example PTA between Singapore and Taiwan signed in 2013 above. Other PTAs include a definition of the covered IPR areas in the investment chapter, or include articles on the IPR areas protected by the PTA. The tangible IPR scope is conditioned by the mentioned IPR scope variable, meaning that whenever an IPR area is coded as tangible, it is also coded as mentioned. The tangible IPR scope identifies those PTAs that include more detailed provisions for IPR areas and is a specification of the mentioned IPR scope variable. The example PTA between Singapore and Turkey signed in 2015 shows an excerpt of the copyright provisions included in the PTA. Besides mentioning copyright as being covered by the IPR regulations in the PTA, it entails tangible copyright commitments such as related IPR conventions or the term of protection.

Example for IPR Scope Tangible (t)
Singapore Turkey 2015
Chapter 15
[…] Copyright and related rights
Article 15.3 Protection Granted

> *The Parties shall comply with the rights and obligations set out in the Berne Convention for the Protection of Literary and Artistic Works (of 9 September 1886, as last revised at Paris on 24 July 1971), the WIPO Copyright Treaty (adopted in Geneva on 20 December 1996), the WIPO Performances and Phonograms Treaty (adopted in Geneva on 20 December 1996), and the TRIPS Agreement. The Parties may provide for protection of performers, producers of phonograms and broadcasting organisations in accordance with the relevant provisions*

of the International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organisations (done at Rome on 26 October 1961).

Article 15.4 Term of Protection

1. Each Party shall provide, where the term of protection of a work is to be calculated on the basis of the life of the author, that the term shall be not less than the life of the author and 70 years after the author's death.

2. In the case of a work of joint authorship, the term referred to in paragraph 1 shall be calculated from the death of the last surviving author.

3. The term of protection of cinematographic works shall be not less than 70 years after the work has been made available to the public with the consent of the author or, failing such an event within 50 years from the making of such a work, at least 70 years after the making.

4. The term of protection to be granted to producers of phonograms under this Agreement shall last, at least, until the end of a period of 50 years computed from the end of the year in which the phonogram was published, or failing such publication within 50 years from fixation of the phonogram, 50 years from the end of the year in which the fixation was made.

5. The term of protection for rights in broadcasts shall be not less than 50 years after the first transmission or making of the broadcast.

6. The terms laid down in this Article shall be calculated from the first of January of the year following the event which gives rise to them.

[…]

The scope variables do not assess the content of the IPR provisions nor rate them according to their implications. The aim is to differentiate between those PTAs that do not define IPRs, those that define IPRs on a general level, and those that go further and include tangible obligations regarding the defined IPR areas. In total, I coded 22 scope variables, eleven for both mentioned and tangible scope provisions for each identified area of IPR. *Table 8* shows all IPR scope variables, starting on top with the mentioned category (m) and followed by the tangible category (t).

Table 8: IPR Scope Variables (N=22)

Variable	Description
ipr_m_copyrights_related_rights	Does the IPR definition/chapter mention copyrights and/or related rights?
ipr_m_trademarks	Does the IPR definition/chapter mention trademarks?
ipr_m_geo_indications	Does the IPR definition/chapter mention geographical indications?
ipr_m_industrial_designs	Does the IPR definition/chapter mention industrial design?
ipr_m_patents	Does the IPR definition/chapter mention patents?
ipr_m_undisclosed_information	Does the IPR definition/chapter mention undisclosed information (including knowhow)?
ipr_m_layout_design_integ_circuits	Does the IPR definition/chapter mention layout-designs (topographies) of integrated circuits?
ipr_m_new_plant_varieties	Does the IPR definition/chapter mention new plant varieties?
ipr_m_trad_knowledge_genetic_resources	Does the IPR definition/chapter mention traditional knowledge and/or genetic resources?

Variable	Description
ipr_m_encrypted_program_ carrying_satellite_signals	Does the IPR definition/chapter mention encrypted program-carrying satellite signals?
ipr_m_domain_names	Does the IPR definition/chapter mention domain names?
ipr_t_copyrights_related_rights	Does the IPR definition/chapter include tangible commitments on copyrights and/or related rights?
ipr_t_trademarks	Does the IPR definition/chapter include tangible commitments on trademarks?
ipr_t_geo_indications	Does the IPR definition/chapter include tangible commitments on geographical indications?
ipr_t_industrial_designs	Does the IPR definition/chapter include tangible commitments on industrial design?
ipr_t_patents	Does the IPR definition/chapter include tangible commitments on patents?
ipr_t_undisclosed_information	Does the IPR definition/chapter include tangible commitments on undisclosed information (including knowhow)?
ipr_t_layout_design_integ_ circuits	Does the IPR definition/chapter include tangible commitments on layout-designs (topographies) of integrated circuits?
ipr_t_new_plant_varieties	Does the IPR definition/chapter include tangible commitments on new plant varieties?
ipr_t_trad_knowledge_genetic_ resources	Does the IPR definition/chapter include tangible commitments on traditional knowledge and/or genetic resources?
ipr_t_encrypted_program_ carrying_satellite_signals	Does the IPR definition/chapter include tangible commitments on encrypted program-carrying satellite signals?
ipr_t_domain_names	Does the IPR definition/chapter include tangible commitments on domain names?

Out of these eleven IPR areas, seven are included in the TRIPS agreement: copyrights, trademarks, GIs, industrial designs, patents, layout design of integrated circuits and undisclosed information. Under the patent section, TRIPS also requires protection of new plant varieties, yet TRIPS does not include tangible provisions on the regulation of new plant varieties. Thus, the inclusion of (tangible) provisions on new plant varieties, traditional knowledge and genetic resources (TK & GR), encrypted-program-carrying satellites, and domain names can already be classified as TRIPS-plus. The coding of the TRIPS-plus provisions is described in more detail in the subchapter *3.1.2.5 TRIPS-plus Variables (T+PTAs dataset)*.

Generally, the areas of IPR are not used to subset other variables, as the dataset aims to be systematic and comprehensive, which could be undermined by only coding for certain IPR areas. However, for the TRIPS-variables, we focused on the areas of patents, copyrights and trademarks for enforcement and exhaustion based on the PTAs actual focus on these IPR areas (see *3.1.2.5 TRIPS-plus Variables (T+PTAs dataset)*).

3.1.2.3 IPR Enforcement Variables

As all provisions in trade agreements, IPR provisions ultimately need enforcement measures to ensure that infringements of the IPR regulation have consequences. I divided the enforcement variables into the categories of general or specific. In total my dataset includes 14 enforcement variables, composed of seven variables for both general as well as specific enforcement. *Table 9* shows all IPR enforcement variables, starting with the seven general enforcement variables on top, and followed by the seven specific enforcement variables.

Table 9: IPR Enforcement Variables (N=14)

Variable	**Description**
ipr_general_enforcement	Is there a general statement on IPRs enforcement?
ipr_dispute_settlement_mechanism	Is there an explicit dispute settlement mechanism directly related to IPRs (without considering investment chapters)?
ipr_investment_dispute_settle-ment_mechanism	If IPR defined as investment: Is there an explicit dispute settle-ment mechanism?
ipr_excluded_from_dsm	Is IPR explicitly excluded from the dispute settlement mecha-nism?
ipr_investment_expropriation_exception	If IPR defined as investment: is there an exception for expropri-ation for compulsory licenses/intellectual property rights?
ipr_implementation	Is there a general statement on IPRs implementation?
ipr_border_measures	Is there a general statement on border measures related to IPRs?
ipr_special_requirements_related_border_measures	Are there special requirements related to border measures for the enforcement of IPRs?
ipr_civil_administrative_proce-dures_remedies	Are there any civil and administrative procedures and remedies defined for the enforcement of IPRs?
ipr_provisional_measure	Are there any provisional measures defined for the enforcement of IPRs?
ipr_criminal_procedures_remedies	Are there any criminal procedures and remedies defined for the enforcement of IPRs?
ipr_service_provider_liability	Is there a service provider liability defined for the enforcement of IPRs?
ipr_committee	Is there an IPR Committee monitoring implementation/enforce-ment/administration of IPRs?
ipr_transparency	Is there a statement on transparency defined to ensure the en-forcement of IPR protection?

The category of general enforcement covers variables that state a general intention to enforce IPRs, usually without being more specific on how to enforce them. This category includes a general statement to enforce IPRs (ipr_general_enforcement) and a special mentioning of a dispute settlement mechanism (DSM) for IPRs (ipr_dispute_settlement_mechanism). Of course, if IPRs are included in a PTA than the PTA's DSM also covers them, yet this variable codes only if there are DSMs directly linked to intellectual property. And if IPRs are defined as investment, I included an additional variable coding the DSM for investment (ipr_investment_dispute_settlement_mechanism). Investment chapters often include an *investor*-to-state dispute settlement mechanism whereas other chapters such as intellectual property rights are covered by a *state*-to-state dispute settlement mechanism. With an *investor*-to-state DSM, investors can seek compensation for expropriation whilst the general PTA dispute settlement reaction often results in punitive trade sanctions from one state to the other (Fink & Reichenmiller, 2005: 7). The differentiation between the locations of the DSM can thus have broader implications. In certain cases, IPRs are explicitly excluded from DSM, to avoid both an investor-to-state as well as a state-to-state DSM (ipr_excluded_from_dsm). In other cases when IPRs are defined as investment, PTAs grant an exception from expropriation for intellectual property rights, i.e. in the case of compulsory licenses (ipr_investment_expropriation_exception). Under the category general enforcement, I also coded if the PTA ensures to the implementation of the IPR provisions (ipr_implementation) and mentions border measures in regard to IPR enforcement (ipr_border_measures).

For the category of specific enforcement, I looked at those enforcement provisions that go beyond general statements and set specific standards on the enforcement of IPRs. First of all, I coded if there were special requirements in relation to the enforcement of border measures (ipr_special_requirements_related_border_measures). This can be, for example, the suspension of infringing goods, a requirement to provide information at the border, or even that suspended goods are being destroyed. Further, I coded if there are any predefined civil administrative procedures or remedies for example that judicial authorities can order infringers to pay damages, order the seizure or destruction of counterfeit goods (ipr_civil_administrative_procedures_remedies), or if provisional measures are granted such as that authorities can act on requests for relief *inaudita altera parte* (e.g. *ex parte* search and seizure orders) expeditiously (ipr_provisional_measure). Subsequently, I coded if there were provision on concrete criminal procedures or remedies such as penalties for wilful counterfeiting on a commercial scale for example penalties like imprisonment or monetary fines (ipr_criminal_procedures_remedies) and if the agreements regulated the liability of service providers such as legal incentives for service providers to cooperate with copyright owners in deterring the unauthorised storage and transmission of copyrighted material (ipr_service_provider_liability). Finally, some PTAs set in place an IPR specific committee (ipr_committee) or grant transparency to ensure the enforcement of IPR regulations (ipr_transparency).

In TRIPS, some of these specific enforcement variables are already included. More specifically, Article 41 to 61 in TRIPS cover the first four specific variables *ipr_special_requirements_related_border_measures, ipr_civil_administrative_procdures_remedies, ipr_provisional_measure* as well as *ipr_criminal_procedures_remedies*. This was considered during the coding process and when a PTA reaffirmed specific articles of TRIPS on enforcement, the corresponding specific enforcement variables were coded as well. Usually PTAs include more than a TRIPS references on these variables. However, this is a common feature for example in EFTA agreements:

> **EFTA Philippines 2016**
> Annex XVIII Article 16
> *The Parties shall provide in their domestic laws, rules and regulations for enforcement provisions for rights covered by Article 1 (Subject Matter) that shall at least be of the same level as that provided in the TRIPS Agreement, in particular Articles 41 to 61thereof.*

The enforcement variables play an important role in the regulation of IPRs as they give the necessary edge the IPR provisions and set a clear path for all PTA members on how the IPR provisions should be implemented and in what way any infringement ought to be dealt with.

3.1.2.4 IPR Multilateral Coherence Variables

Within the IPR chapter, there are often references to other international IPR regulation fora such as the TRIPS agreement, the Rome Convention, or the Patent Law Treaty (PLT). I started with a preset list of the most common IPR conventions, then used an inductive approach to code the IPR regulation fora and added those conventions to the codebook, which were found in a PTA.

Table 10 shows their category, the abbreviations of the coded IPR regulations, the concerned IPR area as well as the IPR regulation fora. The categories are divided into WTO agreements, followed by the WIPO Convention establishing the WIPO, WIPO administrated conventions and classifications and Conventions not governed by the WIPO. The convention and abbreviations are described in more detail in the codebook of my dataset (*Appendix 2: Codebook of IPRs in PTAs Dataset*). Each convention has a corresponding IPR area that it predominantly covers such as the Trademark Law Treaty (TLT) regulates trademarks; except for TRIPS, which covers multiple IPR areas. The last row lists the fora of IPR regulation, and most of the referenced agreements are classified as IPR conventions principally regulating IPRs (see *Figure 5: Fora of IPR Regulation*). The WIPO Convention is an exception, as it does not regulate IPRs per se, however, constitutes the IPR governing World Intellectual Property Organization.

Table 10: Multilateral IPR Regulation References in PTAs

Category	Coded Agreements	IPR Area	IPR Regulation Fora
WTO Agreements	TRIPS	Multiple areas	IPR agreements
	Doha declaration	Patents	IPR agreements
WIPO	WIPO Convention	- (IPR governance)	- (IPR governance)
WIPO Governed Conventions	Rome	Copyrights	IPR conventions
	Paris	Industrial Designs	IPR conventions
	Berne	Copyrights	IPR conventions
	WCT	Copyrights	IPR conventions
	WPPT	Copyrights	IPR conventions
	Phonograms Geneva	Copyrights	IPR conventions
	Beijing	Copyrights	IPR conventions
	Singapore	Trademarks	IPR conventions
	TLT	Trademarks	IPR conventions
	PLT	Patents	IPR conventions
	Brussels	Programme-carrying satellite signals	IPR conventions
	Nairobi	Trademarks	IPR conventions
	Budapest	Patents	IPR conventions
	Hague	Industrial designs	IPR conventions
	Lisbon	Geographical indications	IPR conventions
	Madrid	Trademarks	IPR conventions
	Madrid Protocol	Trademarks	IPR conventions
	PCT	Patents	IPR conventions
WIPO Governed Classifications	Nice	Trademarks	IPR conventions
	Strasbourg	Patents	IPR conventions
	Vienna	Trademarks	IPR conventions
	Locarno	Industrial designs	IPR conventions
Non-WIPO Governed Conventions	EPC	Patents	IPR conventions
	UPOV	New plant varieties	IPR conventions
	IPPC	New plant varieties	IPR-related conventions
	CBD	TK & GR	IPR-related conventions
	UCC Geneva	Copyrights	IPR conventions
	UCC Paris	Copyrights	IPR conventions
	UDRP	Domain names	IPR conventions

All these 32 conventions are coded as a separate variable under the category of multilateral coherence. When PTAs only include own IPR standards without considering the already existing global settings and other fora of IPR regulation they run the risk of further fragmenting the regulation on IPRs. By including and referencing other IPR agreements and conventions, and IPR-related agreements and conventions, PTAs can ensure a certain level of coherence with the other fora of IPR regulation. Even though some PTAs go beyond the WTO commitments, there are also many PTAs that embed and reaffirm and thus reinforce the status quo of IPR regulation. The references to other multilateral fora of IPR regulation thus ensure a certain degree of multilateral coherence.

At first, I coded the identified multilateral coherence variables binary (0/1), yet soon realized that this would mean losing the differentiation between those PTAs that merely reference an IPR convention up to those reaffirming it. This, of course, is a general problem when coding legal text, as it is often a challenge to translate the nuances of the legal language into a binary codebook. After seeking advice from legal experts, I decided to code the level of regulation categorically. Now all multilateral coherence variables are coded on a scale ranging from 0-5 to reflect the level of commitment and bindingness of provisions. The coded multilateral coherence variables were coded using the subsequent gradations:

0: *not included*
1: *reference*
2: *reaffirmation of certain parts (articles, paragraphs)*
3: *recommendation, e.g. make every possible effort (non-binding, non-commitment, intention) "will favourably consider acceding to", "express their attachment to observing the obligations flowing from the following multilateral conventions", "shall apply to accede"*
4: *accession, e.g. shall accede/ratify, e.g. "shall undertake to obtain their adherence"*
5: *reaffirmation & compliance, are already part of IPR treaty (e.g. 260_Croatia Moldova_2004: "The Contracting Parties confirm the importance they attach to the obligations arising from the following multilateral conventions")*
NA: *PTA was signed before IPR treaty.*

Additionally, there is a special category ‘NA’ for those PTAs that were signed before the IPR convention in question was signed. In those cases, a classification into categories of multilateral coherence would not have been meaningful and would have tilted the number unjustifiably towards the ‘0’ occurrences.

In total, I coded 38 variables for the category of multilateral coherence, out of which 32 are for the IPR conventions listed above. The maximum score within a single agreement is 24 achieved in the Central European Free Trade Agreement (CEFTA) signed in 2006, i.e. it references 24 of the agreements listed in *Table 10*. For one of these conventions, UPOV, there are four additional variables coded, each according to the UPOV version the PTA references. UPOV is a special case, as there have been a number of revisions with severe consequences for the stringency of IPR regulation. For example, with the revision in 1991, the convention grants more stringent rights for plant breeders (IPR right holders) and thus compared to the precedent version is more stringent on the regulation of new plant varieties. Of course, not every PTA includes a specific note to which UPOV version it is referring to. Yet for those that do, the differentiation is reflected in these four additional UPOV sub-variables.

Furthermore, I included one variable on the convention deadline as some PTAs grant a specific transitional period until the multilateral coherence variables have to be implemented, i.e. a deadline until a specific convention has to be ratified. The last variable in this category takes care of the fact, that certain PTAs include a statement in the IPR section, that all IPR agreements, to which both or all PTA members are party to, are being reaffirmed. In those cases where I found such a statement, I recoded all other multilateral convention variables according to the membership of the PTA members at the time of the PTA signature. *Table 11* lists all coded variables for the multilateral coherence category and the corresponding coding question:

Table 11: IPR Multilateral Coherence Variables (N= 38)

Variable	**Description**
ipr_trips_1994	How does the treaty include the TRIPS agreement?
ipr_doha_2001	How does the treaty include the Declaration on the TRIPS agreement and public health?
ipr_wipo_1967	How does the treaty include the WIPO Convention?
ipr_rome_1961	How does the treaty include the Rome Convention?
ipr_paris_1883	How does the treaty include the Paris Convention?
ipr_bern_1886	How does the treaty include the Bern Convention?
ipr_wipo_copyright_1996	How does the treaty include the WCT?
ipr_wipo_phono_1996	How does the treaty include the WPPT?
ipr_phonograms_geneva_1971	How does the treaty include the Convention for the Protection of Producers of Phonograms Against Unauthorized Duplication of Their Phonograms?

Variable	Description
ipr_audiovisual_performances_beijing_2012	How does the treaty include the Beijing Treaty?
ipr_trademarks_singapore_2006	How does the treaty include the Singapore Treaty?
ipr_trademark_law_treaty_geneva_1994	How does the treaty include the TLT?
ipr_patent_law_treaty_2000	How does the treaty include the PLT?
ipr_prog_carr_signals_trans_satellite_brussels_1974	How does the treaty include the Brussels Convention?
ipr_olympic_symbol_nairobi_1981	How does the treaty include the Nairobi Treaty?
ipr_patents_budapest_1977	How does the treaty include the Budapest Treaty?
ipr_industrial_design_hague_1925	How does the treaty include the Hague Agreement?
ipr_appellation_origin_lisbon_1958	How does the treaty include the Lisbon Agreement?
ipr_marks_madrid_1891	How does the treaty include the Madrid Agreement?
ipr_protocol_marks_madrid_1989	How does the treaty include the Protocol of the Madrid Agreement?
ipr_patent_cooperation_treaty_1970	How does the treaty include the PCT?
ipr_marks_nice_1957	How does the treaty include the Nice Agreement?
ipr_patent_classification_strasbourg_1971	How does the treaty include the Strasbourg Agreement?
ipr_figurative_elements_marks_vienna_1973	How does the treaty include the Vienna Agreement?
ipr_classifiaction_industrial_designs_locarno_1968	How does the treaty include the Locarno Agreement?
ipr_european_patent_connvention_1973	How does the treaty include the EPC?
ipr_new_varieties_plants_upov_1961	How does the treaty include the UPOV?
ipr_upov_1968	*Does this treaty refer to the 1968 version of UPOV?*
ipr_upov_1972	*Does this treaty refer to the 1972 version of UPOV?*
ipr_upov_1978	*Does this treaty refer to the 1978 version of UPOV?*
ipr_upov_1991	*Does this treaty refer to the 1991 version of UPOV?*
ipr_international_plant_protection_convention_1951	How does the treaty include the IPPC?
ipr_cbd_biodiversity_1992	How does the treaty include the CBD?
ipr_universal_copyright_convention_geneva_1952	How does the treaty include the UCC (Geneva, 1952)?
ipr_universal_copyright_convention_paris_1971	How does the treaty include the UCC (Paris, 1971)?
ipr_uniform_domain_name_res_udrp_1991	How does the treaty include the UDRP?
ipr_convention_deadline	Is there a deadline to accede/implement to those treaties?
ipr_both_parties	Does the treaty mention (generally) binding multilateral agreements to which both are party?

Only within the EU agreements, I found references to domestic IPR fora, i.e. EU Directives on IPR regulation. These are not listed as individual variables but were considered for the coding of the other IPR variables. Whenever there was such a reference with a reaffirming commitment of a Directive, the coding was adapted according to the content of the Directive, and a comment was added in the dataset. The comment states which coding of what category was affected by which Directive, for example, for the agreement between the EU and Serbia signed in 2008 the coding of the enforcement variables were affected by the Directive 2004/48/EC. The Directives did not always lead to an adaption of the coding as some provisions were already coded based on the PTA text. In total, the domestic IPR fora provision of the EU impacted the coding of 14 PTAs.

3.1.2.5 TRIPS-plus Variables (T+PTAs dataset)

When looking at IPRs in PTAs, there is no getting around TRIPS-plus provisions. According to Vivas-Eugui (2003, 4) "TRIPS-*plus* refers to commitments that go beyond what is already included or consolidated in the TRIPS Agreement." He distinguishes three categories of TRIPS-plus agreements or commitments: new areas of IPRs are included, more extensive standards of protection are granted such as an extension of the term of protection, or certain options granted under TRIPS are eliminated or reduced (Vivas-Eugui 2003, 4). Some go further when differentiating TRIPS-plus and would call the first category by Vivas-Eugui TRIPS-*extra*, as it regulates new, additional areas of IPR previously not regulated in TRIPS such as domain names. Moreover, whilst TRIPS-plus stands for more stringent IPR provisions, some distinct it from TRIPS-*minus* provisions that stand for less stringent IPR regulation than the ones included in TRIPS (Cimoli et al. 2014, 508 et seqq.). One example of TRIPS-minus provisions is the regulation of IPR exhaustion, i.e. how to handle parallel imports. TRIPS grants members that they are free to decide on how they want to regulate the exhaustion of IPRs and it is explicitly not regulated (TRIPS Article 6). However, PTAs include provisions regulating the exhaustion of IPRs by either leaving it at the TRIPS level (free to decide), regulating it more stringently by binding exhaustion to the regional or national level (TRIPS-plus), or granting international exhaustion, i.e. loosening the regulation on the exhaustion of IPRs (TRIPS-minus). As shown with exhaustion, the nuances on what constitutes TRIPS-plus provisions are subtle and require a certain level of expertise. Thus, the main problem with compiling a TRIPS-plus dataset is that it is difficult to identify TRIPS-plus variables and even harder to assess their importance.

The basic approach to recognise TRIPS-plus variables is to compare the text of TRIPS to the IPR provisions in PTAs and look at the differences in the legal texts. As TRIPS alone consists of 32 pages of provisions and some of the PTAs include more than 50'00 words on IPRs, the approach of simply comparing textual overlays proved to be unproductive. Luckily enough, there was a team of researchers in Canada with extensive legal expertise preparing a dataset on the TRIPS-plus regulation on the domestic level (Gold, Morin, and Shadeed 2019; Morin and Gold 2014), that was looking for a matching coding for TRIPS-plus in PTAs. Out of said team, Jean-Frédéric Morin joined forces with me, and we adapted their TRIPS-plus codebook for the domestic level to match TRIPS-plus provisions in PTAs. The result is our T+PTA dataset on TRIPS-plus variables in PTAs (Morin and Surbeck 2019).

For our T+PTA dataset, we decided not to differentiate TRIPS-plus any further and also included some provisions that can fall into the TRIPS-extra, yet no the TRIPS-minus category. Besides the variables based on the domestic IPR coding (Gold, Morin, and Shadeed 2019; Morin and Gold 2014), "*we added some variables following an inductive exploration of the PTAs. We only excluded TRIPs-plus variables that were highly specific to a particular agreement, were subject to wide range of interpretations, or had limited potential economic or social impacts*" (Morin and Surbeck 2019). Moreover, we added and adapted PTA specific TRIPS-plus variables identified in previous research (Cottier, Sieber-Gasser, and Wermelinger 2015; M. El-Said 2005; Fink and Reichenmiller 2005; Lindstrom 2010). For example from Fink and Reichenmiller (2005), we added two variables: one on the test data exclusivity for new uses of registered products and one on foreign test data exclusivity for accepted, approved and or submitted applications. Furthermore, I added seven variables based on the textual comparison of TRIPS to PTAs such as if the term of industrial design is more than ten years or if the PTAs include specific lists on protected GIs. Besides those variables, not all our TRIPS-plus variables were new, as we reused four variables of my IPRs in PTAs dataset. Namely, we used the protection of encrypted program-carrying satellite signals, the protection of domain names on the Internet (scope category), the variable on service provider liability (enforcement category) and the UPOV coding for accession and reaffirmation (multilateral coherence category). The origin of each variable can be identified within the codebook (see *Appendix 3: Codebook of T+PTA Dataset*). The PTA selection for the coding of the TRIPS-plus variables is based on my IPRs in PTAs dataset. We coded all those PTAs that included either specific enforcement variables and or tangible IPR provisions (see *Index*

IPR specific described in *3.2.3 Dataset Development*), which left us with 165 respectively 159 PTAs to code. In total, we coded 90 TRIPS-plus variables consisting of mainly specific provisions for each IPR area as well as enforcement and exhaustion provisions. *Table 12* shows the distribution of TRIPS-plus variables across the different categories.

Table 12: TRIPS-plus Variables (N=90)

Category	Number of Variables
IPR areas	**57**
Copyright	*6*
Trademarks	*9*
Geographical indications	*8*
Industrial design	*1*
Patents	*9*
Undisclosed information	*7*
Layout-designs of integrated circuits (semiconductors)	*1*
New plant varieties	*2*
Traditional knowledge & genetic resources	*12*
Encrypted program-carrying satellite signals	*1*
Domain names	*1*
Enforcement	**27**
Exhaustion	**6**

Our variables cover the same eleven areas of IPR as my IPRs in PTA dataset. The quantity of variables is not randomly selected but reflects the content of TRIPS-plus we found in PTAs. Those IPR areas with only a few variables simply are not regulated by many TRIPS-plus provisions. For example, industrial design is often regulated through PTAs, yet usually repeats TRIPS, and we found only one provision where it goes beyond TRIPS, which is the extension of the term of protection.

For this doctoral thesis, I only use *Index* variables based on the TRIPS-plus variables (see *3.2.3 Dataset Development*), and I will not go into detail on the specific TRIPS-plus variables for each IPR area. Instead, I highlight some examples for each category in the subsequent paragraph. The entire codebook including coding instructions can be found in *Appendix 3: Codebook of T+PTA Dataset*.

On copyrights, we coded, for example, if the term of protection is more than the 50 years granted in TRIPS and if PTAs are more stringent when it comes to the anti-circumvention of technology measures. So far, it is still debatable if such provisions also cover the circumvention of geblocks (blocked copyrighted material due to the geographical location) such as VPNs. For trademarks we coded amongst others extended scope variables if a trademark can protect a single colour like *"Nivea Blue"*. On geographical indications, we coded, for example, if a country's name can be protected as GI and if the PTAs include specific lists on which GIs are protected through the PTA. As stated before, for industrial design we only identified one variable on the term of protection granted in the PTA (more than ten years equals TRIPS-plus). We also coded if there is a term extension for patents or, for example, if selection or second-use patents are granted. Both selection patents, which claim a subclass of a previously granted patent for a feature not included in the initial patent, as well as second-use patents, that claim a new use from a previously existing patent, run the risk of leading to the evergreening of patents (see page *36* "*evergreening*"). On undisclosed information, we coded variables such as if test data exclusivity is granted for a specific timeframe, new uses, or foreign test data. Test data constitutes a large share of the R&D costs, that can be compensated by granting exclusivity. On the other hand, test data exclusivity means that e.g. in the case of pharmaceuticals generic producers have to reproduce test data, which prolongs the time until generic product can access a market and might impact the prices of generic products.

For the layout-designs of integrated circuits (semiconductors), we determined one TRIPS-plus variable, namely if compulsory licenses are not permitted for semiconductors. On new plant varieties, we coded a variable for an accession or reaffirmation commitment to the UPOV Convention and one coding when the tangible provisions on new plant varieties go beyond the content of the UPOV Convention. Similar to the multilateral coherence variables, we coded the traditional knowledge and genetic resources variables as categorical variables according to their legal commitment. The twelve variables for TK and GR are actually three individual variables coded in a binary manner for binding and non-binding commitments, once for TK and once for GR. For example, the variable about a government enforced equitable benefits sharing mechanism is coded four times: according to its legal bindingness (binding/non-binding) twice for traditional knowledge and twice according to its legal bindingness for genetic resources. For both IPR areas of encrypted program-carrying satellite signals and domain names, we coded one variable, concretely if those IPR areas are protected through the PTA.

For enforcement, most of our TRIPS-plus variables are distinguished by their corresponding IPR category. This is due to the fact that most PTAs reference specifically patents, copyrights and trademarks in their TRIPS-plus enforcement variables. For example, in the PTA between Australia and Chile 2008, the TRIPS-plus enforcement variable granting ex parte search and seizure procedures refers only to trademarks and copyrights. Moreover, certain provisions are only TRIPS-plus for a specific area of IPR as TRIPS already includes enforcement measures for the other areas. For example, the variable on criminal sanctions is only TRIPS-plus for patents as TRIPS already grants this for copyrights and trademarks (TRIPS Article 61).

The enforcement variables could have wide-ranging implications, for example, the variable on injunctions codes if the burden of proof shifted from patent holder to generic producer. This can entail that production can be stopped or products can be destroyed without checking the validity of the patent first. Or the variables on border measures can denote that even transiting goods can be seized if they infringe on copyrights. This can affect, for example, legally produced generic goods stopping in transiting countries, where they infringe IPRs even though they are not intended to enter the market of the transiting country. A classic example would be the case of a shipment of generic medicine from India to Venezuela, that transited through the Netherlands, where it was seized due to infringements of patents and containing counterfeit goods (Sell 2013, 55).

Regarding exhaustion, we coded for regional and national exhaustion of patent, trademarks, and copyrights. Usually, these are the three categories referred to explicitly regarding exhaustion. If there was a general statement on the exhaustion of IPRs without indicating an area, then all three areas were coded positively.

National exhaustion means that the first sale exhausts (ends) the rights of IPR holders (importation and or distribution) on a product nationally. However, with national exhaustion IPR holders can control the importation and for example deny parallel imports, which can lead to domestic protectionism. According to Vivas-Eugui (2003, 18), the blocking of imports can limit the accessibility of goods such as pharmaceuticals at lower prices. National exhaustion is inconsistent with the NT provision as foreign exporters can buy the same products but do not have the same conditions in the market because they need to ask for the consent of domestic IPR holders before importing their goods. It is not an issue in regard to MFN as all other nations are discriminated.

Regional exhaustion means that within a predefined region – usually composed of PTA member states – parallel importation is allowed. It is still more stringent than TRIPS as it removes the countries flexibility to decide on how to regulate exhaustion. Moreover, it contradicts MFN as countries within the defined region receive beneficial treatment and equal rights to domestic IPR holders, whilst countries outside of the region – usually non-PTA members – are still denied parallel importation.

3.2 Codebook and Dataset Development

As the previous sections described the PTA selection and coded variables, the following sections give more detail on the development of both the codebook and the dataset. First, I will describe the preprocessing of the data, the coding process, and the codebook development, and second, the content of the dataset as well as data validity and reliability. The codebooks and datasets for both data collections – IPRs in PTAs and T+PTA – are available on the DESTA homepage (DESTA 2017).

3.2.1 Preprocessing and Coding of PTAs

Besides the list of PTAs, I was also able to use the pdf-hardcopies of trade agreements of the DESTA collection. However, the DESTA pdf-copies mostly include the main treaty body and do not include any annexes or joint declarations. Not all PTAs are structured in the same manner and not every PTA section is included alike. For example, EFTA treaties include in their main bodies only a short paragraph on IPRs and reference the annex or protocols for more detailed provisions. And within those additional documents are mostly highly substantive provisions regulating IPR. Thus, for the purpose of coding IPRs, I added annexes and protocols where they were available and evidently required, i.e. referred to in the base treaty in relation to IPRs. The completed legal documents were coded manually and converted into a numerical dataset. In general, all variables are coded in a binary manner, i.e. '0' stands for cases where the variable was not found in the PTA, and '1' where the variable was found. Exceptions are the variables for the word count of IPR content (ID 9), variables for multilateral coherence (ID 72-103), and the transitional periods for IPR provisions (ID 18) and multilateral coherence (ID 104).

All coded variables of both my dataset on IPRs in PTAs as well as the TRIPS-plus variables of the T+PTA dataset are double-coded. This means that all agreements were coded by myself and afterwards by another coder. For all instances where there was a difference in coding, I looked at the PTA text again, analysed the reasons for the discrepancy and adjusted the coding and where necessary specified the coding instructions in the codebook. Where an adjustment in the coding instructions was necessary, the previously coded agreements were revised as well to ensure a consistent coding approach.

Most agreements are available in English, and a substantial number is available only in Spanish. Very few of the agreements are in German, French or Arabic. Where necessary, I consulted with native speakers of the corresponding language for translations and coding. The codebook includes besides the variable names the coding instructions, and for certain TRIPS-plus variables the respective keywords in Spanish.

3.2.2 Codebook Development

The codebook started with the variables coded by Valdés and Tavengwa (2012) resp. Valdés and McCann (2014) and the previous DESTA IPR variables, and were continuously adapted based on the findings and insights of the analysis of IPRs in PTAs. Besides the variable names and coding instructions, the codebook contains several other indications disperse across eight columns: *ID*, *Category*, *Variable*, *Description*, *Note*, *Range*, *Occurrence*, and *Mode*.

The *ID* is a number assigned to all variables of the IPR in PTAs codebook, and ranges from '1' to '151'. The numbers were assigned in descending order to the coded and calculated variables. The *Category* identifies to which coding category the variables belong to such as "IPR general" or "Index IPR specific enforcement", and the *Variable* column equals the variable name in the dataset. The *Description* represents the coding question and can be further explained by a *Note*, for example, the consideration for the calculated variables. Where applicable, the *Range* indicates the minimum and maximum value of the variables, and the *Occurrence* identifies in how many PTAs the variable was found. The *Occurrence* is listed twice: once for all coded PTAs (724) and once for all PTAs used in the analysis (698). Finally, the *Mode* labels the variable according to their origin, i.e. if the variable was coded, calculated, or a base variable from DESTA. The complete codebooks of the IPRs in PTAs dataset and the T+PTA dataset can be found in the appendix (*Appendix 2: Codebook of IPRs in PTAs Dataset* resp. *Appendix 3: Codebook of T+PTA Dataset*).

3.2.3 Dataset Development

As stated in subchapter on the selection of PTAs (*3.1.1 Selection of Preferential Trade Agreements*), DESTA is a dynamic dataset, and I adapted my PTA selection to match the DESTA base. This means that other DESTA variables can be easily added from the newest DESTA version by the DESTA ID variable included in both datasets. Generally, the PTA name should be identical to the one in DESTA. For example, PTAs of the European

Union are listed in DESTA under the abbreviation of EC for Economic Community, which is the same in my dataset. Besides the matching ID and PTA names, I also added new PTAs according to updated versions of DESTA until July 2018. This left me with a broad range of covered years, as the oldest PTA in my dataset was signed in 1948 and the most recent in 2018.

In order to make my variables more accessible and quantifiable, I added indexes on each category summarising or binary identifying the coded variables across categories. For the TRIPS-plus variables I also added indexes to generalise the coded variables. In total, I coded 86 variables, created 40 dummy variables and 25 index variables. The dispersion across categories is shown in *Table 13*.

Table 13: Variables in Dataset (N=189)

Category	Number of Variables
Coded variables	**86**
IPR general	*12*
IPR scope mentioned	*11*
IPR scope tangible	*11*
IPR general enforcement	*7*
IPR specific enforcement	*7*
IPR multilateral coherence	*38*
Dummy Variables	**40**
IPR general dummy	*2*
IPR general enforcement dummy	*2*
IPR multilateral coherence dummy	*36*
Indexes	**29**
Index IPR general	*2*
Index IPR specific	*2*
Index IPR scope mentioned	*4*
Index IPR scope tangible	*5*
Index IPR general enforcement	*2*
Index IPR specific enforcement	*2*
Index IPR enforcement	*2*
Index IPR multilateral coherence	*10*
TRIPS-plus (T+PTA)	**34**
Index IPR TRIPS-plus	*34*
Total of Variables in Dataset	**189**

I created dummies, i.e. binary recoding of coded variables, to simplify the content of connected or categorical variables. There are two dummy variables falling into the category of *IPR general dummy*. The first one entails if the PTA grants either MFN and or NT in the IPR section without considering the investment chapter. The second one does the same but includes the coding of MFN and NT in the investment chapter. This way it can be easily identified if the TRIPS standards are being repeated, at least partially, without having to analyse multiple variables. There are also two *IPR general enforcement dummy* variables. The first one considers the dispute settlement coding of both the IPR as well as the investment chapter, to quickly identify if the PTA includes an IPR specific DSM. The second variable is a conditional variable: if IPRs are defined as investment and if IPRs are not exempted from expropriation this variable is coded as '1'. This dummy variable helps to identify if IPR rights holder could challenge the issuance of a compulsory license even in the case of a national emergency as an act of investment expropriation.

The *Multilateral coherence dummy* variables code for each of the conventions if the multilateral coherence variables were coded regardless of the bindingness of their commitment (values higher than 0). Thus, for each of the coded multilateral conventions, I created a dummy variable showing if the convention was included in any manner in the PTA.

Besides the dummy variables, I created indexes that assist in identifying the overall IPR content of the PTAs. *Table 14* describes the indexes for each category. However, for more detail on the calculation and composition see *Appendix 2: Codebook of IPRs in PTAs Dataset*. For this doctoral thesis, I will only use the TRIPS-plus indexes and not the individual coding of TRIPS-plus variables. As my aim is to make general statements on IPRs in PTAs, I will mostly use the TRIPS-plus dummy variables, which do not put weight on single variables. Furthermore, Morin and I (Morin and Surbeck 2019) have created subindexes for patents, copyrights and trademarks that balance the variables in the respective IPR area according to their importance and make them comparable amongst one another (see *Appendix 3: Codebook of T+PTA Dataset*, ID I_43, I_44, I_45). For most of the following descriptive statistics, I will use the indexes listed on the subsequent page.

Table 14: Description of Indexes

Index Categories	Descriptions
Index IPR general	Indexes combining the general variables on IPR such as MFN and NT treatment as well as general enforcement variables (not incl. multilateral coherence variables) – Sum – Dummy
Index IPR specific	Indexes combining tangible IPR scope variables and specific IPR enforcement variables (not incl. multilateral coherence variables) – Sum – Dummy
Index IPR scope mentioned	Indexes on the mentioned IPR scope variables – Sum – Dummy – Dummy if TRIPS areas covered – Dummy if TRIPS-plus areas covered
Index IPR scope tangible	Indexes on the tangible IPR scope variables – Sum – Dummy – Dummy if TRIPS areas covered – Dummy if TRIPS-plus areas covered – Degree of tangible IPR coverage
Index IPR general enforcement	Indexes on the general IPR enforcement variables – Sum – Dummy
Index IPR specific enforcement	Indexes on the specific IPR enforcement variables – Sum – Dummy
Index IPR enforcement	Indexes on the general and specific IPR enforcement variables – Sum of general and specific enforcement – Degree of general and specific enforcement
Index IPR multilateral coherence	Indexes on the IPR multilateral coherence variables – Dummy for WIPO governed conventions – Level of WIPO and WTO embeddedness – Number of NAs within level of WIPO and WTO embeddedness – Level of WIPO and WTO embeddedness, corrected by NAs – Level of treaty embeddedness, excluding TRIPS, Doha, WIPO Convention and European Patent Convention – Level of treaty embeddedness, categorized – Sum of all multilateral coherence variables incl. bindingness – Dummy of all multilateral coherence variable incl. bindingness – Sum of all multilateral coherence variables excl. bindingness – Dummy of all multilateral coherence variable excl. bindingness
Index IPR TRIPS-plus	Indexes on the TRIPS-plus variables (T+PTA dataset) – Sum of TRIPS-plus variables per PTA – Sum for each IPR area – Sum for enforcement – Sum for exhaustion

Index Categories	Descriptions
Index TRIPS-plus (cont.)	– Dummy for all TRIPS-plus variables – Dummy for each IPR area – Dummy for enforcement – Dummy for exhaustion – Subindex on patents – Subindex on copyrights – Subindex on trademarks – Sum of all patent variables incl. enforcement and exhaustion – Sum of all copyright variables incl. enforcement and exhaustion – Sum of all trademark variables incl. enforcement and exhaustion

3.2.4 Validity and Reliability Checks

The codebook used both an inductive approach by including the findings in PTAs as well as relying on the insights of previous research. This combination makes sure that the most important variables for a systematic and comprehensive dataset on IPRs in PTAs are covered. Of course, there can be still more fine-grained coding and as PTAs develop the codebook will have to be updated as well.

To ensure the reliability of the coded variables, all PTAs and variables were coded twice, once by myself and once by another coder. The only variable single-coded is the variable on the word count as it is based on IPR excerpts of the PTA and generated automatically by the software word. For the coding process, the coder used the instructions in the codebook, and after a block of coded PTAs, we compared our coding. Where there were errors or imprecisions in the codebook, we made the necessary adjustments and recoded all concerned variables individually before comparing our coding output again. For the final version of the dataset, I ruled over each discrepancy and decided on the correct coding after consulting with my coder.

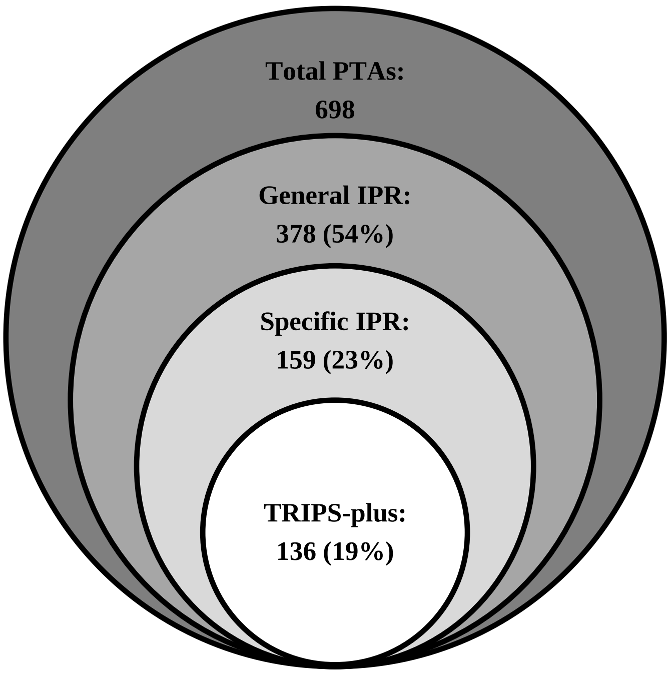
For both datasets, the intercoder reliability (IRR) is high, indicating that the codebook and its instructions lead to reliable results. For the IPRs in PTAs dataset, I achieved an unweighted Cohen's kappa of $k = 0.945$, and for the T+PTA we achieved an unweighted Cohen's kappa of $k = 0.881$ (see *Appendix 4: Cohen's Kappa for 2 Coders (Weights: unweighted) – IRR*).

3.3 Descriptive Statistics

For the descriptive statistics, I will only use those coded agreements also included in DESTA, which leaves me with a total of 698 PTAs. The PTAs range from 1948 to 2018, and half of the covered agreements were signed before 1997. The dataset covers PTAs for 202 countries. On average, countries are members of 21 PTAs, for example, India, South Korea, and Nicaragua. Other countries are only members to one PTA, for example, Andorra and Mongolia. By far party to the most agreements are the EU member states, headed by France with 106 PTAs, followed by for example, Germany and the Netherland with each 105 PTAs. The dataset includes 425 bilateral, and 273 multilateral PTAs, whereof the multilateral PTAs have on average twelve members countries (median = 9).

The results show that far more PTAs include regulations on IPRs than anticipated. *Figure 8* shows the distribution of IPRs across the dataset along the indexes of general IPR, specific IPR and TRIPS-plus. Out of the 698 PTAs utilised in the analysis, the majority (378, 54% of all PTAs) includes at least general IPR provisions. About half of them include beside general IPR provisions also specific IPR provision (159, 23% of all PTAs). And most of the agreements including specific IPR provisions contain IPR provisions that go beyond the regulations in TRIPS (136, 19% of all PTAs). The percentages remain unchanged if all 724 coded PTAs are used.

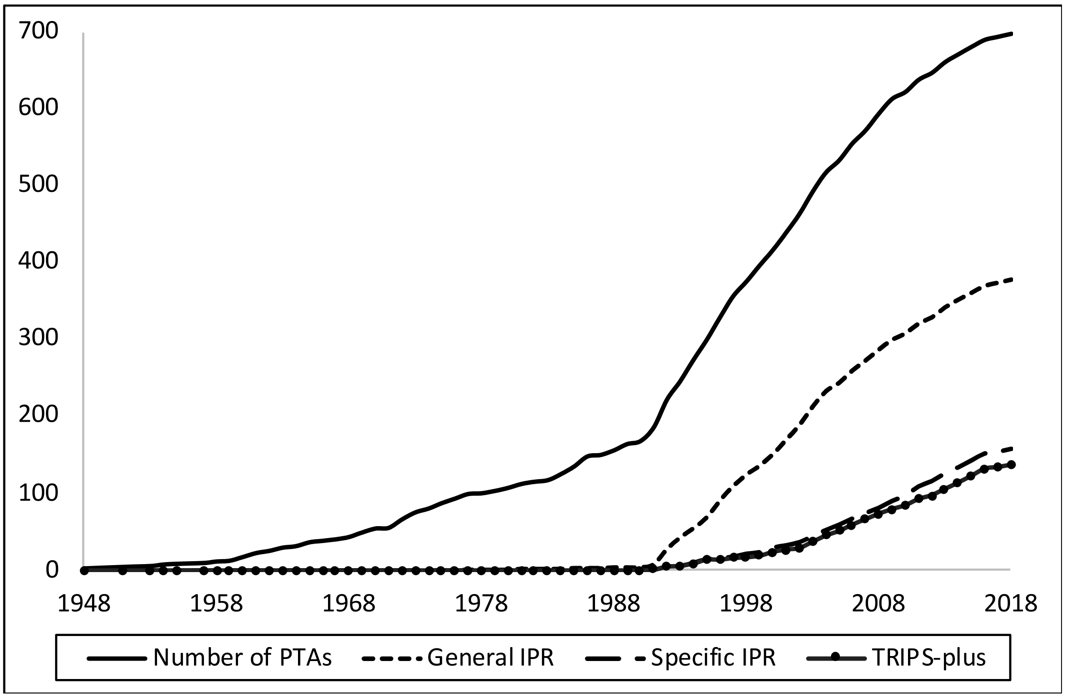
Figure 8: IPR Content of PTAs



Out of the 202 countries that have signed a PTA in the DESTA database, 195 countries have at least one PTA that includes IPR provisions and there are only seven countries that have no IPR in any of their PTAs; namely Andorra, Bangladesh, Bhutan, North Korea, Maldives, Monaco and Nepal. Also, there are 47 countries, which include no specific IPR provisions in their PTAs, including Azerbaijan, Argentina, Brazil, Cuba, Iran, Iraq, Nigeria, Syria and Zambia. This also concludes that 155 countries include specific IPRs in their PTAs. Moreover, there are 110 countries, which have signed PTAs that go beyond TRIPS and only 92 countries that have not signed a PTAs including TRIPS-plus provisions. The majority of the countries in my dataset has thus signed at least one agreement including TRIPS-plus provisions.

A closer look at the dissemination of the PTAs including IPRs shows a more differentiated picture. *Graph 1* illustrates the number of PTAs (cumulative) per year and the count of PTAs including IPRs (cumulative) according to the indexes of general IPR, specific IPR and TRIPS-plus across the coded period (1948-2018). *Graph 1* shows that when the surge of PTAs began, the regulation of IPRs through PTAs was insignificant. Only in the early 90ies, general IPR provisions began to be included, whilst the regulation of specific IPR and TRIPS-plus provisions seem like a more recent phenomenon with an upwards trend.

Graph 1: Development of IPRs in PTAs (cumulative)



The steep increase of the number of PTAs goes hand in hand with a similar development for the inclusion of general IPR provisions. The dataset shows that the inclusion of IPR provision is indeed a recent phenomenon, yet also that IPRs have been included long before TRIPS achieved a WTO-wide established connection between trade and intellectual property.

The first trade agreement to include at least general provisions on IPRs was the agreement between EC and Syria signed in 1977 (European Community comprising Belgium, Italy, Luxembourg, France, Netherlands, West Germany, Denmark, Ireland, and the United Kingdom). The IPR provision focused on the parties agreeing to cooperate on patents (EC Syria 1977, Title I, Article 4.1). From there on, more and more trade agreements started to include IPRs, at least in a general manner. For example, the third PTA to include IPR provisions, between Israel and the US signed in 1985, already dedicates an entire Article to IPRs:

> *"The parties reaffirm their obligations under bilateral and multilateral agreements relating to intellectual property rights, including industrial property rights, in effect between the parties. Accordingly, national and companies of each Party shall continue to be accorded national and most favoured nation treatment with respect to obtaining, maintaining and enforcing patents of invention, with respect to obtaining and enforcing copyrights, and with respect to rights in trademarks, service marks, tradenames, trade labels, and industrial property of all kinds."* PTA Israel US 1985, Article 14

The first PTAs to include more than just general IPR provision were EFTA Turkey 1991, EFTA Israel 1992, Estonia Switzerland 1992, the Agreement on European Economic Area (EEA) 1992 and the North American Free Trade Agreement (NAFTA) 1992. After NAFTA was signed in 1992, Mexico included specific IPR provisions in their soon following agreements with countries from Central and South America, e.g. Costa Rica 1994, Bolivia 1994, Group of Three 1994, Nicaragua 1997 and Chile 1998.

Many, yet not all the agreements including specific IPR provisions, also include TRIPS-plus provisions. This is even true for agreements signed before TRIPS such as the specific agreements listed in the previous paragraph. The earliest detection of TRIPS-plus provisions also lies in 1991 with the EFTA Turkey agreement, and the inclusion of TRIPS-plus provision has become ever more popular after TRIPS entered into force. For the display of the development of IPR provisions in PTAs, time seems to play an important role. According to M. Kim (2015, 31 et seqq.) there are specific historical patterns in international economic agreements for the time covered by the IPRs in PTAs dataset:

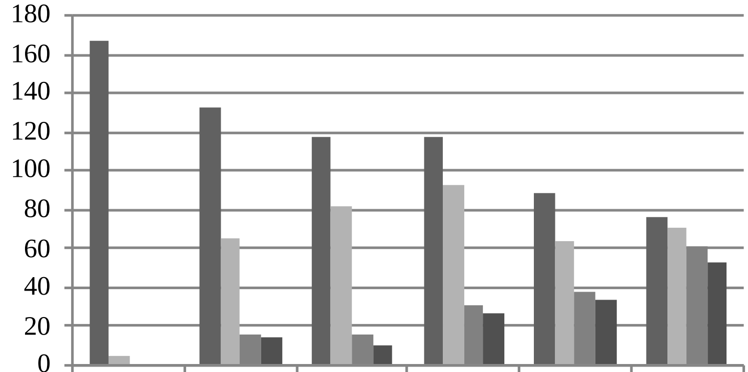
the *Post-World War II period* (1947-1990), the *Post-Cold War period* (1991-2000) and the *Post-information revolution period* (2001-today). For the first period (1947-1990), M. Kim (2015, 41) sees mostly regional agreements, often with a multilateral character, as states looked for a geographically close market to expand their sales opportunity after the second world war and increase their economies of scale. The second period (1991-2000), marks the end of the political blocks of the cold war, the area of the Internet, rise of information technology and a change in the value chains due to facilitation and reduced costs of transportation leading to global supply chains, which goes hand in hand with an increase of bilateral trade agreements (M. Kim 2015, 43). For the third period (2001-today), Kim notes an intensified organisation of global value chains (faster, bigger, deeper, longer), that is not matched by global trade regulation endeavours such as the failure of the Doha Round and a "resurgence of regionalism", i.e. multilateralism of economic agreements (M. Kim 2015, 47).

The IPRs in PTAs dataset provides some support for these categories based on the membership form of the agreements and the ratio trends between multilateral and bilateral agreements. For the first period (until 1990), there are 86 bilateral and 81 multilateral PTAs (-1990), followed by a shift in balance to 159 bilateral and 90 multilateral PTAs (1991-2000), that relative remains the same until today with 180 bilateral and 102 multilateral PTAs (2001-today). So, from a period, where bilateral and multilateral PTAs balanced each other, there is a move towards a preference of bilateral PTAs that persists.

Regarding IPRs, a pivotal moment was TRIPS signed in 1994 and its entry into force in 1995. Based on the distribution of IPRs in PTAs shown in *Graph 1* and the knowledge drawn from M. Kim (2015, 31 et seqq.), the data is divided into the time before specific IPR provisions appeared in PTAs (before 1991), followed by five-year intervals (1991-1995, 1996-2000, 2001-2005, 2006-2010) and concluded by the last few years included in the dataset(2011-2018). To reflect the development over time *Graph 2: Sum of PTAs with IPR Provisions by Time Cohorts* and *Graph 3: Percentage of PTAs with IPR Provision by Time Cohorts* display the number of general IPR, specific IPR and TRIPS-plus provisions over time. Same as in *Graph 1*, the variables are based on the count of the indexes (dummy) per PTA per year, not the sum of provisions per PTA. This reflects if there is something included on the respective index without looking at how many provisions are covered.

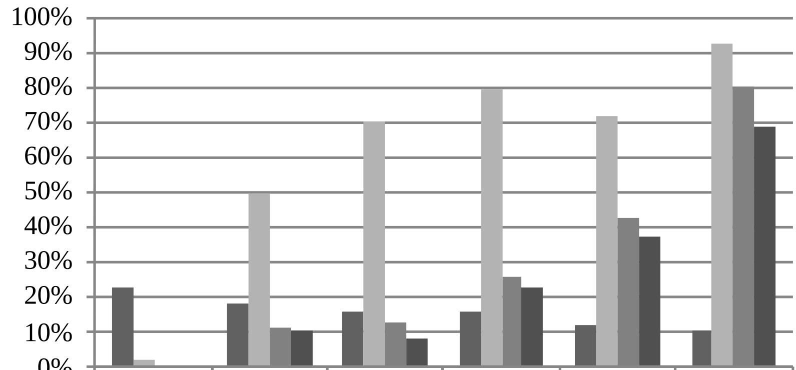
Graph 2 shows how many PTAs were signed in each timeframe, and how many of them included general IPR, specific IPR and TRIPS-plus provisions (count of dummy indexes). In the period around the TRIPS agreements (1991-1995), there were by far the most PTAs signed over a five-year period. When looking at the IPR content, it appears that as the number of PTAs decreases, the count of PTAs with a general IPR content rises and PTAs with specific IPRs and TRIPS-plus provisions has multiplied.

Graph 2: Sum of PTAs with IPR Provisions by Time Cohorts



	Before 1991	1991-1995	1996-2000	2001-2005	2006-2010	2011-2018
Number of PTAs	167	132	117	117	89	76
General IPR	4	65	82	93	64	70
Specific IPR	0	15	15	30	38	61
TRIPS-plus	0	14	10	27	33	52

Graph 3: Percentage of PTAs with IPR Provision by Time Cohorts



	Before 1991	1991-1995	1996-2000	2001-2005	2006-2010	2011-2018
Share of PTAs	23%	18%	16%	16%	12%	10%
General IPR	2%	49%	70%	79%	72%	92%
Specific IPR	0%	11%	13%	26%	43%	80%
TRIPS-plus	0%	11%	9%	23%	37%	68%

Graph 3 reflects the same data as *Graph 2* and shows it in the form of percentages to put some perspective on these numbers. The first row shows the share of PTAs per period

and the subsequent lines show the share of PTAs including general IPR, specific IPR and TRIPS-plus provisions.

The data section of *Graph 3* illustrates that the share of PTAs including IPRs has risen substantially. Before 1991, only 2% of the PTAs included at least general provisions on IPRs, out of the PTAs signed between 1991-1995 almost half of them (49%) included general IPRs and already 11% specific as well as TRIPS-plus provisions. The share of IPR provisions in PTAs has risen over time and that for the most recent cohort (2011-2018) almost all PTAs (92%) include at least general IPR provisions. Moreover, a majority of PTAs also includes specific IPR provisions (80%) as well as TRIPS-plus provisions (68%).

Of course, not all variables in the dataset have the same impact on these statistics. For example, the variable coding for IPRs being excluded from the dispute settlement mechanism (ipr_excluded_from_dsm) was only found in five PTAs, whereas the mentioning of IPRs (ipr_mentioned) was coded for 377 PTAs, and the mentioning of copyrights as part of IPRs (ipr_m_copyrights_related_rights) for 261 PTAs. For the TRIPS-plus dataset, there are also variables which only occurred in a single PTA such as punitive damages granted for patents (enforcement_punitive_damages_patent) coded for the PTA between Morocco and the US signed in 2004 (Article 15.11.7).

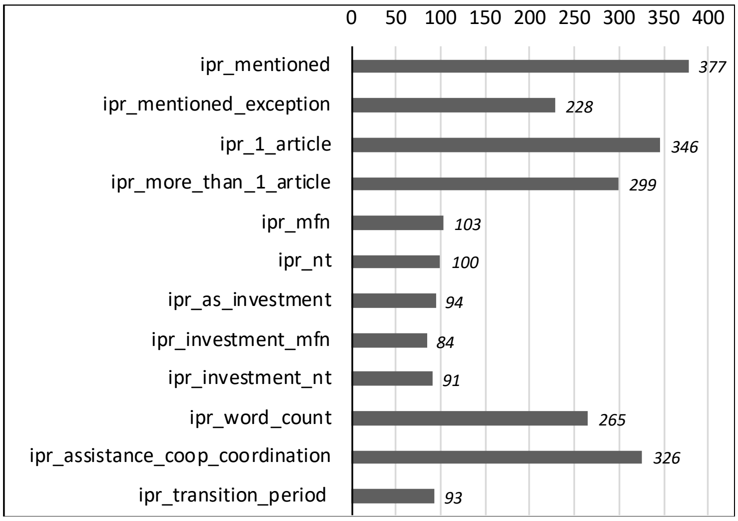
The most reoccurring TRIPS-plus variable coded for 84 PTAs is the enforcement variable on the border measures for exporting and transiting goods (enforcement_border_measures_importing_exporting_transiting_goods). In order to shed some light on the dissemination of all coded variables, the following subchapters give a description of the dataset for the variable categories (*3.3.1* for general IPR, *3.3.2* for IPR Scope, *3.3.3* for IPR enforcement, *3.3.4* IPR multilateral coherence, *3.3.5* TRIPS-plus) and shows the scope preferences according to the PTA member regions (*3.3.6*). Afterwards, the indexes based on the coded variables are used to show the IPR content in PTAs for selected countries relevant for the regulation of intellectual property (*3.3.7*).

3.3.1 Descriptive Statistics General IPR

There are 422 agreements that include at least one of the twelve variables coded for the category of general IPR variables (see subchapter *3.1.2.1*). However, out of these 422, there are 45 PTAs that only mention IPR as an exception to a certain provision, meaning that factually only 377 PTAs include general IPR provisions. This is almost congruent with the index on general IPR listing 378 PTAs, yet taking into account besides the coded general variables also the general enforcement and mentioned IPR scope variables (see *Figure 8: IPR Content of PTAs*). The concrete coding of each coded variable in the general IPR category across all 698 PTAs is displayed in *Graph 4*.

As stated in the paragraph following *Graph 3,* the most commonly coded variable in the dataset is the mentioning of IPRs (377 PTAs), followed by the count variables (one article in 346 PTAs, or more than one article in 299 PTAs), the commitment to assist, coordinate and cooperate in regard to IPRs (273 PTAs), and IPRs being mentioned as an exception (228 PTAs). The reaffirmation of MFN (103 PTAs) and NT (100 PTAs) are far less common and similarly prevalent are the variables on IPR being defined as investment (94 PTAs) and the connected variables on investment being covered by MFN (84 PTAs) or NT provisions (91 PTAs). Around thirteen per cent of all PTAs grant a transition period for IPRs (93 PTAs), that is among those awarding it is on average three-and-a-half years (maximum thirteen years). The transition period can mostly be found in agreements between north-south (50 PTAs) and south-south (40 PTAs) trade agreement members.

Graph 4: Occurrence of General IPR Variables



The word count variable was compiled for 326 PTAs out of all that mention IPRs. It has only been coded if the PTA contained an article specifically on IPRs. So, for example, if the general IPR statement was part of another article such as an article on general WTO disciplines, and intellectual property was mentioned as a subcategory also targeted by said article, then the word count was not compiled to avoid the overrepresentation of words not specifically regulating IPRs. On average, those PTAs that have a word count include around 2’776 words.

Table 15: Word Count by Region

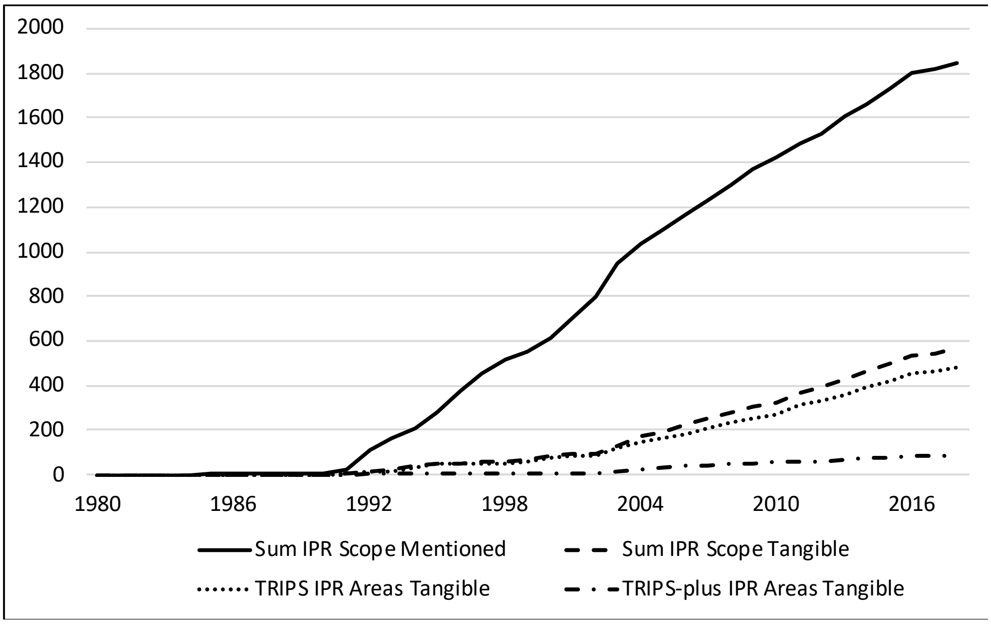
Word Count	NN	NS	SS
Average	135	2’097	445
Maximum	11’552	56’242	9’663

Table 15 shows that both absolutely as well as relatively the north-south PTAs include the most words on IPR regulation. The variance is lowest for south-south PTAs and substantial for north-north PTAs. Thus, even though the north-north PTAs have the lowest average of words on IPRs, their maximum wordiness (11’552) surpasses the one of south-south PTAs (9’663). Of course, the word count is not a perfect indicator of the stringency and content of IPR regulations, but it allows insight to space and weight given to IPRs within the PTA regulation framework. Besides the general IPR provisions, it is thus important to look at the scope of IPRs.

3.3.2 Descriptive Statistics IPR Scope

The category of IPR Scope includes elven variables each for IPR areas mentioned and tangible provisions on these areas (see *3.1.2.2*). Out of all PTAs there are 291 PTAs that mention at least one of the elven IPR areas, and 146 PTAs include tangible IPR provisions. The first PTA mentioning an area of IPR is the agreement between Canada New Zealand signed in 1981 that refers to IPRs and mentions copyright protection. For the tangible IPR provisions, the first PTA was the one between EFTA and Turkey signed in 1991 that includes tangible provisions on industrial designs and patents. As shown in *Graph 1*, the development of the indexes for general and specific IPR takes off around the early 90ies. Comparably, *Graph 5* illustrates the development of the cumulative sum of provisions for mentioned IPR scope variables and tangible IPR scope variables. The tangible IPR scope variables are further differentiated into two categories: those that regulate areas already included in TRIPS such as patents and trademarks, and other areas that were not tangibly covered in TRIPS, namely new plant varieties, TK and GR, encrypted program-carrying satellite signals, and domain names. The graph ranges from the year before the first PTA mentions one of the eleven IPR areas until today (1980-2018).

Graph 5: Development of IPR Scope (cumulative)

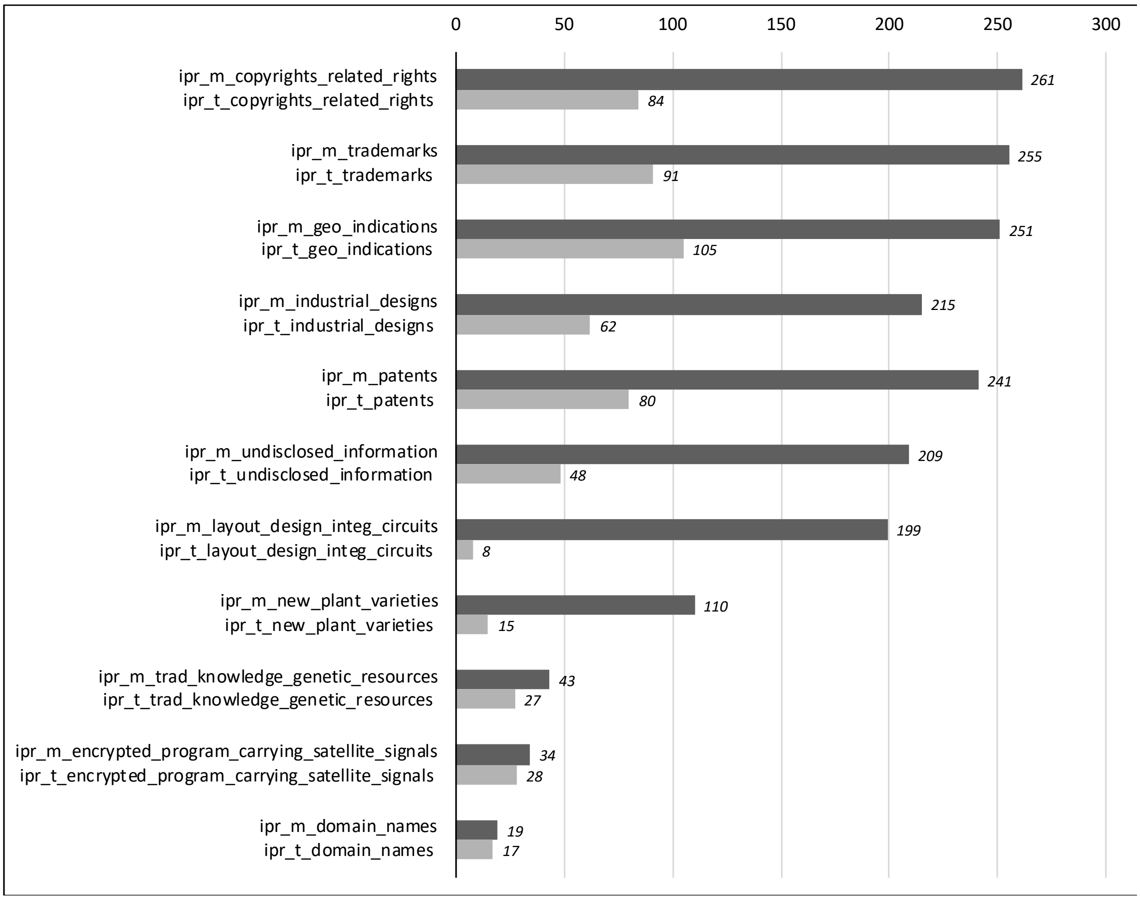


For the scope variables, the development goes upwards, however not linear for both codings of scope variables. *Graph 5* shows that PTAs mention far more IPR areas than they regulate by including tangible provisions on them. The slope for mentioned IPRs is not only absolutely higher but also has a steeper increase than the slope for tangible IPRs. Furthermore, the mentioning of IPRs started on a broader scale in the early 90ies and had increased steadily, whilst the inclusion of tangible provisions started after TRIPS in 1994 to be broader included but linger for another ten years before continuously increasing until now. *Graph 3* supports the same claim for both specific IPR provisions and TRIPS-plus provisions and shows that before 2006 they were only present in a minority of agreements (26% resp. 23% of PTAs signed in between 2001-2005).

For the period from 2011-2018, four out of five PTAs include specific IPR provisions, and out of the 76 PTAs signed in that time, there are 63 PTAs mentioning one of the elven IPR areas (83%) and 58 PTAs that include tangible IPR provisions (76%). To illustrate the occurrence of the individual areas of IPR, *Graph 6* shows the occurrence for each of the 22 coded variables of the IPR areas.

Unlike in *Graph 5*, here the count and not the sum of the variables across all PTAs in the dataset are displayed. As *Graph 6* illustrates, PTAs tend to mention many IPR areas that are not necessarily matched by the tangible provisions on these areas. Only for the TRIPS-plus areas (besides new plant varieties) the mentioning of the IPR area almost matches the tangible provisions on them. The most occurring variables are the one mentioning one of the IPR areas already included in TRIPS lead by copyrights (261 PTAs), trademarks (255 PTAs), geographical indication (251 PTAs), patents (241 PTAs) and closely followed by industrial designs (215 PTAs), undisclosed information (209 PTAs) and layout-designs of integrated circuits (199 PTAs). New plant varieties were already mentioned in TRIPS but are far less represented in PTAs (110 PTAs). The other mentioned TRIPS-plus IPR areas TK and GR are in 43 PTAs, encrypted program-carrying satellite signals in 34 PTAs and domain names only mentioned in 19 PTAs.

Graph 6: Occurrence of IPR Scope Variables



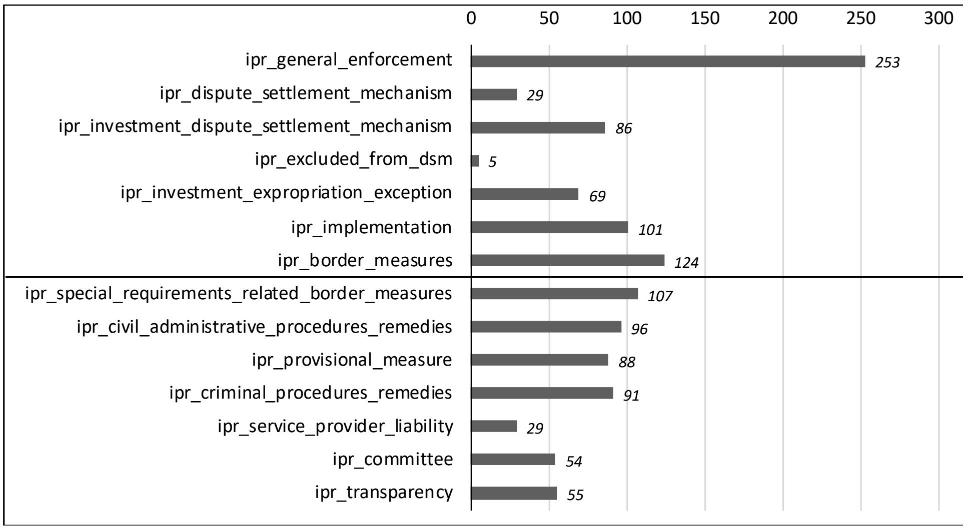
There is far less variance between the occurrence of variables regarding the tangible provisions of the IPR scope. The IPR area with the fewest tangible provisions is by far the one on layout-designs of integrated circuits (8 PTAs), followed by the tangible TRIPS-plus IPR area variables for new plant varieties (15 PTAs), domain names (17 PTAs), TK and GR (27 PTAs), and encrypted program-carrying satellite signals (28 PTAs). Almost twice as many PTAs include something on undisclosed information (48

PTAs) and or industrial designs (62 PTAs). The leading areas with tangible provisions are in ascending order patents (80 PTAs), copyrights (84 PTAs), trademarks (91 PTAs), and on top geographical indication (105 PTAs). Subchapter *3.3.7* gives some insight on the extent of the sum of mentioned and tangible IPR scope for selected countries in comparison to other indexes.

3.3.3 Descriptive Statistics IPR Enforcement

There are two divisions of general and specific enforcement for the fourteen coded variables of the category of IPR enforcement (*3.1.2.3*). Overall, 298 PTAs include either general (294 PTAs) and or specific IPR enforcement provisions (137 PTAs). The agreement between EFTA and Turkey signed in 1991 was the first agreement to include specific enforcement measures by reaffirming TRIPS articles 41 to 61 (see *3.1.2.3*). *Graph 7* illustrates the distribution of IPR enforcement variables across all PTAs.

Graph 7: Occurrence of IPR Enforcement Variables

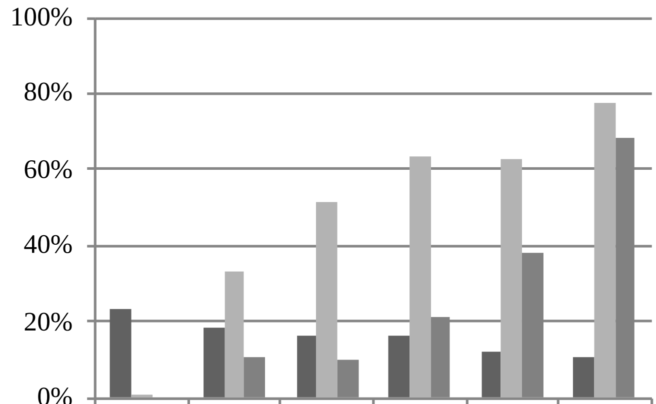


The most common enforcement variable by a long way is the general mentioning of IPR enforcement (253 PTAs), all other enforcement variables are twice as unlikely to be included in a PTA. The second most common variable is the general variable on border measures (124 PTAs), followed by the specific variable on special requirements for border measures (107 PTAs), general provisions to implement the enforcement variables (101 PTAs), specific provisions on civil administrative procedures and remedies (96 PTAs), on criminal procedures and remedies (91 PTAs), on provisional measures (88 PTAs), and a DSM in the investment section applicable to IPRs (86 PTAs). Even fewer agreements include provisions on transparency (55 PTAs) or refer to a committee responsible for IPR matters (54 PTAs). Moreover, each 29 PTAs contain a provision on service provider liability or an IPR specific dispute settlement mechanism, and only five PTAs exclude IPRs from the DSM altogether.

The two calculated variables for this category apply to 103 PTAs. Overall, there are 97 PTAs including an IPR-related DSM (ipr_comprehensive_dispute_settlement_mechanism_dummy) and 27 PTAs allow that compulsory licenses can be challenged even in the case of a national emergency (ipr_investment_expropriation_implication). For more information on these two variables see *3.2.3 Dataset Development*.

Both scope and enforcement categories follow an upward trend over time. *Graph 8* shows the development of general and specific IPR provisions over time and displays the percentage of PTAs including enforcement provisions per year (dummy indexes for general and specific enforcement).

Graph 8: Sum of PTAs with IPR Enforcement Provisions by Time Cohorts



	Before 1991	1991-1995	1996-2000	2001-2005	2006-2010	2011-2018
Share of PTAs	23%	18%	16%	16%	12%	10%
IPR general enforcement	1%	33%	51%	63%	63%	78%
IPR specific enforcement	0%	11%	10%	21%	38%	68%

For the time before 1991, the agreements included next to none IPR enforcement provisions, neither general nor specific. Afterwards, there was a steep increase in general enforcement provisions with the result that beginning only six years later (1996-today), a majority of PTAs includes at least general enforcement provisions on intellectual property. The specific enforcement provisions started to be included around the same time but lagged the inclusion of general IPR enforcement. Only for the last cohort (2011-2018), the specific IPR enforcement provisions can be found in a majority of PTAs.

3.3.4 Descriptive Statistics IPR Multilateral Coherence

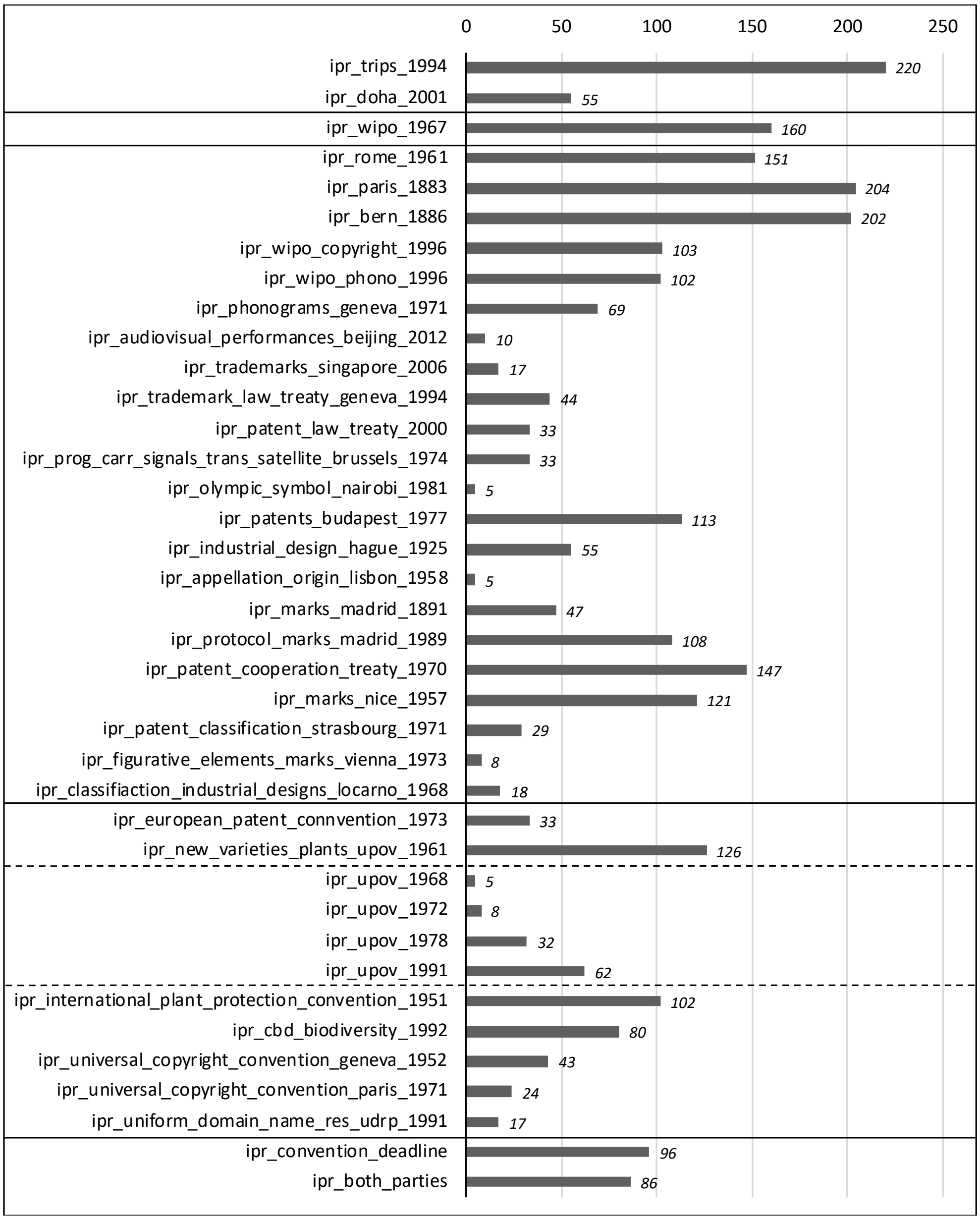
Across all PTAs, there are 306 PTAs (44%) that include at least one reference to an IPR multilateral coherence convention, and 255 (37%) that include at least one accession or reaffirmation commitment (coded value of '*4*' or '*5*'). The agreement including by far the most binding commitments is CEFTA making binding commitments on 23 out of 24 referenced conventions (see *3.1.2.4 IPR Multilateral Coherence Variables*). On average, PTAs include binding commitments on three multilateral coherence conventions. *Table 16* focuses on the binding IPR multilateral coherence commitments coded for the most and least number of PTAs. The agreement with the most binding references is TRIPS agreement (ipr_trips_1994) coded for 183 PTAs, and the two conventions coded bindingly only for five the Nairobi Treaty on the Protection of the Olympic Symbol (ipr_olympic_symbol_nairobi_1981) and the Lisbon Agreement for the Protection of Appellations of Origin and their International Registration (ipr_appellation_origin_lisbon_1958).

Table 16: Binding References of IPR Multilateral Coherence Variables

IPR Multilateral Coherence Variable	Binding Commitment
In more than 100 PTAs	
ipr_trips_1994	183
ipr_bern_1886_dummy	182
ipr_paris_1883_dummy	173
ipr_rome_1961_dummy	143
ipr_patent_cooperation_treaty_1970_dummy	132
ipr_new_varieties_plants_upov_1961_dummy	120
ipr_marks_nice_1957_dummy	115
ipr_patents_budapest_1977_dummy	107
In less than 10 PTAs	
ipr_patent_law_treaty_2000_dummy	9
ipr_figurative_elements_marks_vienna_1973_dummy	7
ipr_audiovisual_performances_beijing_2012_dummy	6
ipr_trademarks_singapore_2006_dummy	6
ipr_appellation_origin_lisbon_1958_dummy	5
ipr_olympic_symbol_nairobi_1981_dummy	5

These extremes are comparable to the references regardless of their bindingness displayed in *Graph 9*. It shows the occurrence of the coded variables for multilateral conventions across all PTAs. Same as shown for the binding commitments, the least common multilateral conventions coded for only five PTAs are the Nairobi Treaty on the Protection of the Olympic Symbol and the Lisbon Agreement for the Protection of Appellations of Origin and their International Registration. Besides the clear leader TRIPS, which is referenced in 220 PTAs, the Paris Convention (204 PTAs), the Bern Convention (202 PTAs), the WIPO Convention (160 PTAs) and the Rome Convention (151 PTAs) are referenced most often in PTAs.

Graph 9: Occurrence of IPR Multilateral Coherence Variables



The convention deadline average across all PTAs including a reference to an IPR multilateral convention is one year, and among those including a deadline the average lies at four years. The development of multilateral coherence is shown in subchapter *3.3.6* according to the regions and the distribution of multilateral coherence variables for selected countries in subchapter *3.3.7*.

3.3.5 Descriptive Statistics TRIPS-plus

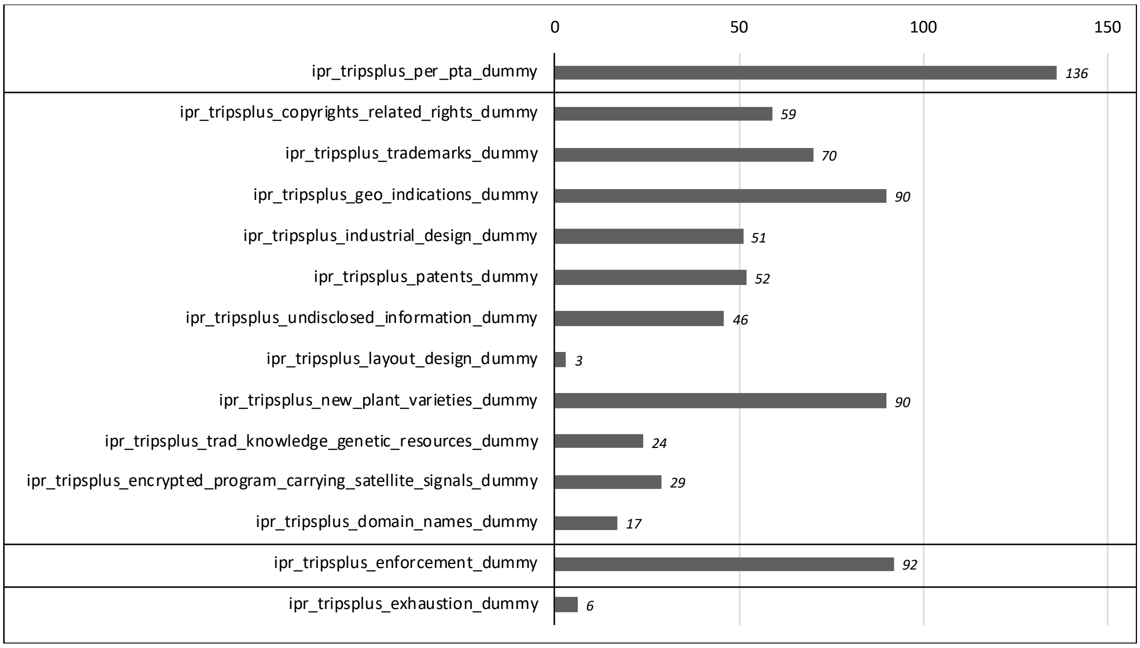
The descriptive statistics are based on the indexes of the coded TRIPS-plus variables. The indexes summarise the TRIPS-plus variables coded per category, i.e. either the indexes range over all variables coded on TRIPS-plus provisions (ipr_tripsplus_per_pta_dummy) or are summarized per IPR area, enforcement, and exhaustion (see *3.1.2.5*). For more details on the coded variables see *Appendix 3: Codebook of T+PTA Dataset*.

In the dataset, there are 136 PTAs (20%) that include at least one TRIPS-plus provision. As shown in *Graph 3: Percentage of PTAs with IPR Provision by Time Cohorts*, there are no PTAs including TRIPS-plus provisions before 1991, and their share in new PTAs constantly remains low. Only since the *post-information revolution period* (2001-today, see M. Kim 2015, 31 et seqq.), the number of PTAs including TRIPS-plus provisions clearly starts to rise, and today (2011-2018) 68% of PTAs include TRIPS-plus regulations. *Graph 10* on the following page illustrates, which TRIPS-plus categories are regulated most often by at least one coded TRIPS-plus variable in PTAs.

Most often regulated in PTAs on a TRIPS-plus level are IPR enforcement (92 PTAs), geographical indications (90 PTAs) and new plant varieties (90 PTAs). In around 10% of all PTAs, there are TRIPS-plus provisions on trademarks (70 PTAs), followed by regulations on copyrights (59 PTAs), patents (52 PTAs), industrial designs (52 PTAs) and undisclosed information (46 PTAs). There are fewer agreements including TRIPS-plus provisions on encrypted program-carrying satellite signals (29 PTAs), TK and GR (24 PTAs) or domain names (17 PTAs). And only a handful of agreements regulates exhaustion (6 PTAs) and layout-designs (topographies) of integrated circuits (3 PTAs).

Those PTAs that include TRIPS-plus provisions on average include regulations on 14 different variables. A majority of PTAs with TRIPS-plus content regulates trademarks (51%), GIs (66%), new plant varieties (66%) and enforcement (68%) on a TRIPS-plus level. The following subchapters illustrate the TRIPS-plus development for different regions (*3.3.6*) and selected countries (*3.3.7*).

Graph 10: Occurrence of TRIPS-plus Variables



3.3.6 Descriptive Statistics Grouped by Region

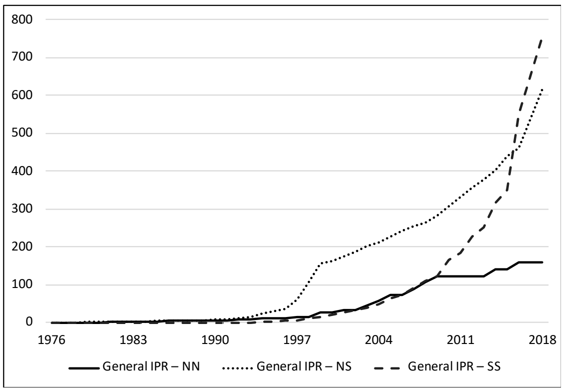
As shown in the previous subchapters, the dissemination of IPR variables varies over time and possibly also by region (see *Table 15: Word Count by Region*). Therefore, this subchapter groups some of the indexes according to their regional affiliation. DESTA provides two different forms of regional classifications based on the PTA member states (see *Table 6: Regional Classification of PTAs*). First, the graphs divide the PTAs into the categories of north-north (NN), north-south (NS), and south-south (SS) agreements (*Graph 10*). Afterwards, the PTAs are compared according to their continental embeddedness, i.e. if all member states are located on the same continent (intracontinental) or if the agreement spans across continents and is intercontinental (*Graph 12* and *Graph 13*).

For the display of NN, NS and SS PTAs in *Graph 10*, I use the indexes for general IPR (ipr_general_sum), specific IPR (ipr_specific_sum), TRIPS-plus (ipr_tripsplus_ per_pta) and multilateral coherence (ipr_multilateral_coherence_dummy_sum) (see *Appendix 2: Codebook of IPRs in PTAs Dataset*). The indexes are displayed cumulatively for different periods relative to the number of PTAs signed by each region per year. The graphs start for each index in the year before the first occurrence (index > 0). The first general IPR is included in 1977 (graph ranges from 1976-2018); the first specific IPR and TRIPS-plus provisions are included in 1991 (graphs range from 1990-2018); the first multilateral coherence variable is included in 1985 (graph ranges from 1984-2018). The

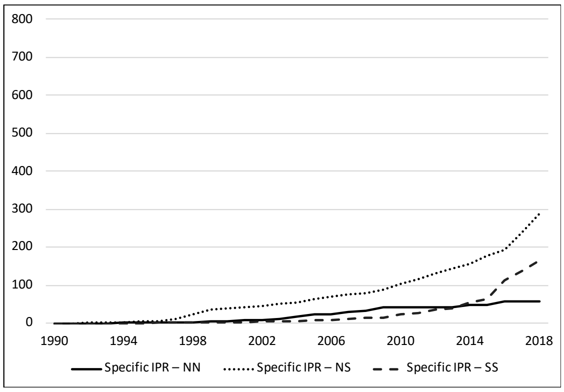
IPR multilateral coherence index shows if any of the multilateral coherence agreements was referenced regardless of the bindingness of the commitment.

Graph 11: Development of IPR Provisions by Region (NN-NS-SS)

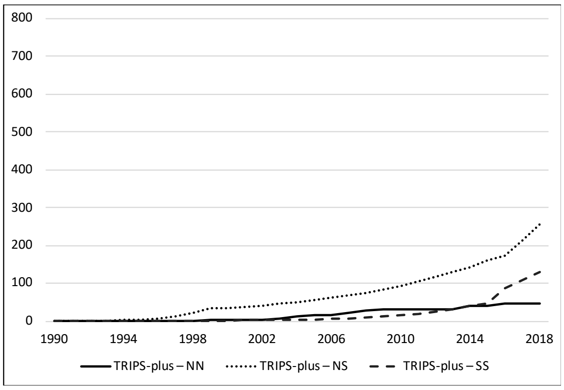
General IPR



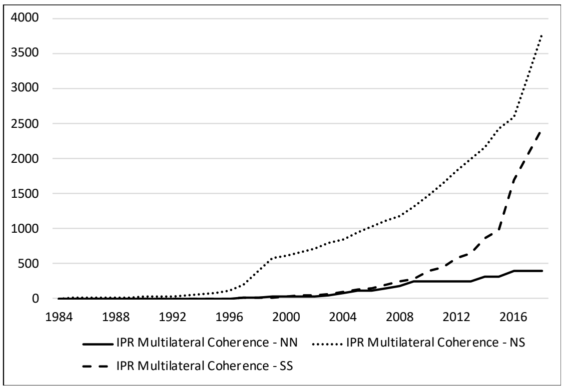
Specific IPR



TRIPS-plus



IPR Multilateral Coherence



The graph on general IPR shows that north-south PTAs include general IPR provisions before both north-north and south-south PTAs. The NS and SS agreements start to increase their provisions later and until 2010 regulate on a similar level. After that, the SS PTAs take off and even surpass the NS agreements with their regulation of general IPRs. Specific IPRs are included on a much lower level than general IPRs and are almost congruent with the inclusion of TRIPS-plus provisions. Both specific and TRIPS-plus provisions show the same regional trends. North-south PTAs include early on already specific as well as TRIPS-plus provisions and are the ones with the steepest increase over time. North-north PTAs are and remain at a low level and are superseded by south-south agreements in 2016. By taking into consideration the number of PTAs per region and the sum of provisions on general IPR, IPR specific and TRIPS-plus provision over time, it becomes clear that north-south PTAs include the most specific and TRIPS-plus provisions. South-south agreements are catching up and have already surpassed them in regards to general IPR provisions, whilst north-north agreements remain on a low level of regulation.

The graph on IPR multilateral coherence shows comparable developments on a higher level, as far more PTAs include some form of reference to IPR conventions than on other IPR regulations (see range of axes of the four graphs). Again, north-south agreements include by far the most provisions on IPR multilateral coherence. However, south-south PTAs also show a steep increase in references to IPR conventions. And same as for the other graphs, north-north agreements operate on a much lower level than NS and SS PTAs.

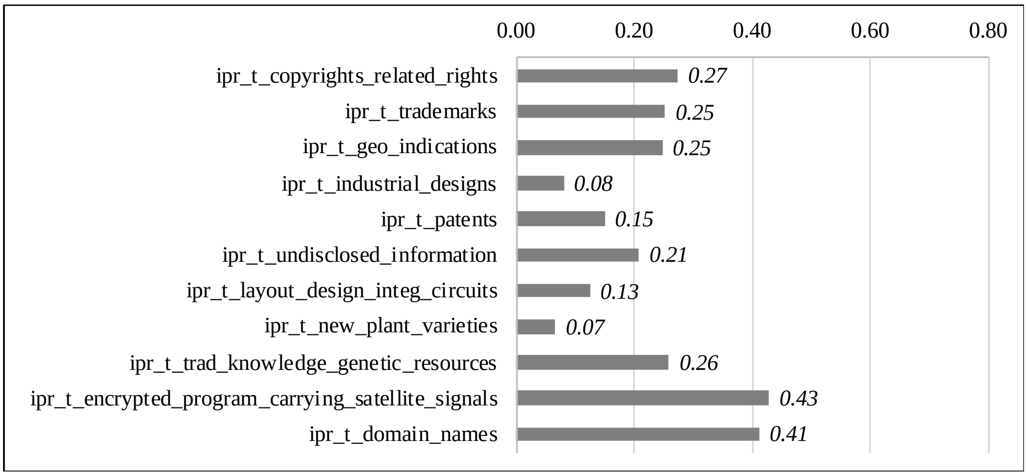
An alternative way to differentiate PTAs is according to the continent base of PTA members for example if all PTA members are from Africa. *Graph 12* and *Graph 13* on the next pages illustrate the occurrence of tangible commitments on the eleven coded IPR areas according to the continental region of the PTA members.

The PTAs within the regions of Africa resp. Oceania includes no tangible IPR scope variables and are therefore not displayed in a graph. *Graph 12* shows the occurrence of tangible IPR scope provisions in PTAs of the Americas and Asia as a percentage of all PTAs for the respective region.

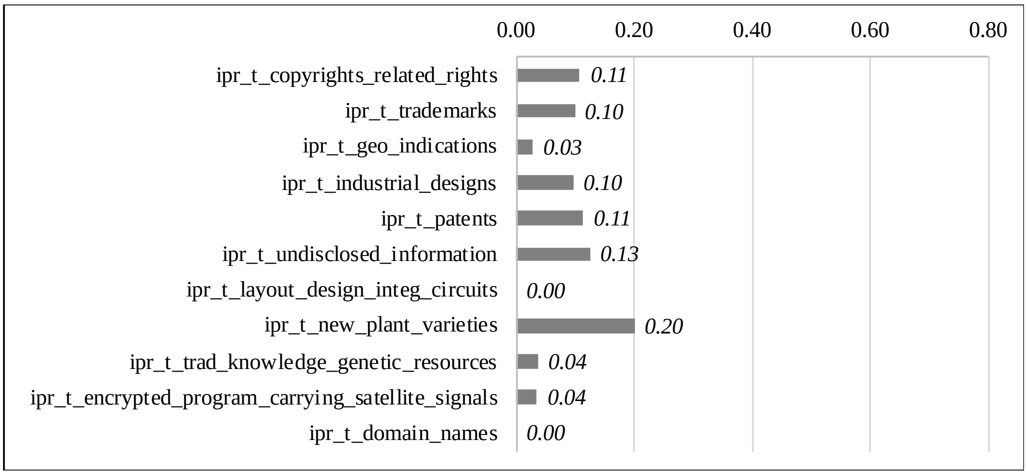
PTAs between countries from the American continent have no IPR area that is included in a majority of PTAs. Their preferred IPR areas to protect by tangible provisions are encrypted program-carrying satellite signals (43% of PTAs) and domain names (41% of PTAs). Their least common IPR area protected by tangible regulations in PTAs are new plant varieties (7% of PTAs) and industrial design (8% of PTAs). The agreements between Asian countries, on the other hand, include tangible provisions in fewer PTAs than the Americas. Unlike the Americas, the highest scoring and thus mostly represented IPR area in Asian PTAs are new plant varieties (20% of PTAs). Also, Asian PTAs have slightly more PTAs including industrial design (10% of PTAs) than the Americas (8% of PTAs). However, they do not regulate layout-designs of integrated circuits nor domain names on a tangible level through their PTAs (0% of PTAs). The following *Graph 13* illustrates the occurrence of tangible IPR scope provisions in PTAs of Europe and between intercontinental PTA members.

Graph 12: IPR Scope Tangible by Region (Americas, Asia)

Americas



Asia

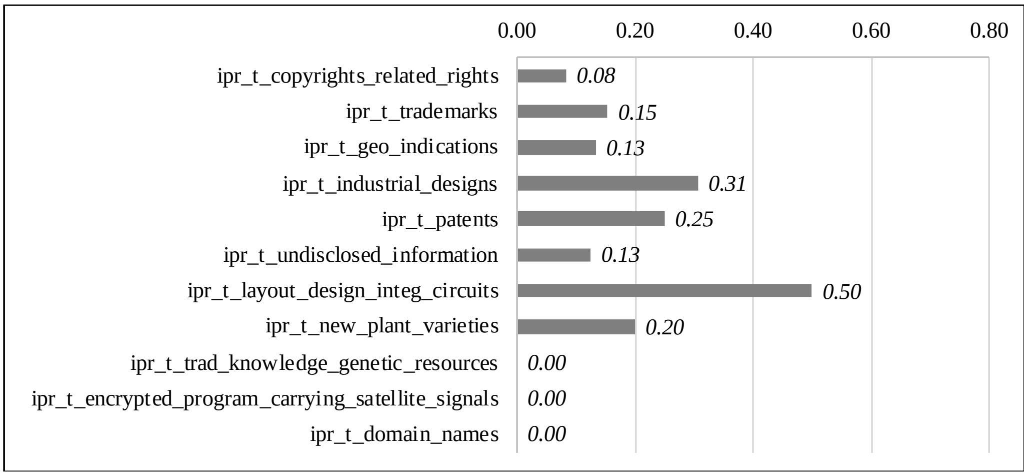


Europe’s PTAs include in every second PTA tangible provisions on layout-designs of integrated circuits (50% of PTAs), yet no tangible regulations for traditional knowledge and genetic resources, encrypted program-carrying satellite signals nor domain names. The inclusion of new plant varieties in PTAs among European countries is as likely as in Asian PTAs (20% of PTAs). Moreover, Europe’s PTAs protect industrial design more than the other continental regions (31% of PTAs).

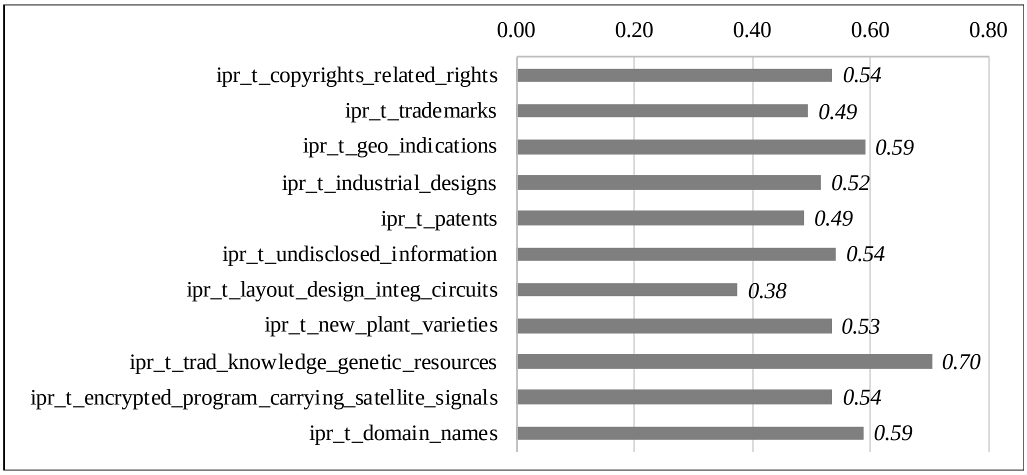
All intracontinental regions include less tangible IPR provisions than the intercontinental PTAs. The only IPR area, where intercontinental provisions are less frequent than intra-regionals are the topographies of integrated circuits (38% of intercontinental PTAs; 50% of Europe’s PTAs), which is the least common IPR provision in intercontinental PTAs. By far the most common one in PTAs between European members are traditional knowledge and genetic resources (70% of PTAs); an area not covered in TRIPS.

Graph 13: IPR Scope Tangible by Region (Europe, Intercontinental)

Europe



Intercontinental



Graph 12 and *Graph 13* show that PTAs with partners from different continents contain more often tangible IPR provisions than intracontinental agreements. Altogether missing from the graphs are intracontinental agreements for Africa and Oceania. Hence, if countries from Africa or Oceania include tangible provisions, then it must be in intercontinental agreements. To see, if there is a comparable variation among countries, the next subchapter illustrates the inclusion of IPR along the different indexes.

3.3.7 Descriptive Statistics Grouped by Selected Countries

As seen in the previous subchapter, there exists substantial variation on the IPR content of PTAs according to the regional composition of PTA members. But how is the situation for individual countries? In order to show the variation across countries, the subsequent graphs are based on the key indexes on IPR content of PTAs (see *3.2.3*).

Included in the comparison are the index on the general IPR content based on the general IPR, general enforcement and the mentioned IPR scope variables (ipr_general_sum); the index on the specific IPR content based on the specific enforcement and tangible IPR scope variables (ipr_specific_sum); the index on general enforcement (ipr_general_enforcement_sum) and specific enforcement (ipr_specific_enforcement_sum); the mentioned IPR scope (ipr_scope_mentioned_sum) and tangible IPR scope variables (ipr_scope_tangible_sum); the index on IPR multilateral coherence variables regardless of their bindingness (ipr_multilateral_coherence_dummy_sum); the overall index of TRIPS-plus variables (ipr_tripsplus_per_pta) as well as the index of TRIPS-plus variables on enforcement (ipr_tripsplus_enforcement) and exhaustion (ipr_tripsplus_exhaustion). For more detailed information on the calculation see *Appendix 2: Codebook of IPRs in PTAs Dataset*.

The decision on which countries should be displayed out of the 202 covered in the IPRs in PTAs dataset, is primarily based on groups and countries related to specific IPR characteristics identified by Maskus (2012). For the descriptive statistics, there are twelve countries resp. country consortiums – namely the EU and EFTA – that lend themselves for the analysis of IPR regulation. These twelve are grouped into three blocks based on different IPR criteria (see Maskus 2012).

The first block of countries represents those that are the obvious choice for IPR analysis: western countries and consortiums with a large market and a high interest of protecting their innovation. These are the US, EU, EFTA, and Japan, whereby most previous analysis has concentrated on PTAs by the US, the EU and Japan. However, the EFTA members are also at the forefront of negotiating PTAs leading to 42 EFTA PTAs covered by the IPRs in PTAs dataset, which is almost twice as many as the US represented with 23 PTAs in the dataset (see *Table 18* for the number of PTAs for this category). Furthermore, these are the countries prominently arguing for more stringent IPR protection such as by initiating the Anti-Counterfeiting Trade Agreement (ACTA) signed in 2011. That these countries tend to include more on IPRs in PTAs has already been shown in the so far most comprehensive coding of IPRs in PTAs by Valdés and McCann (2014) (see *2.3 Previous Research on IPRs in PTAs*, 36). The first block is labelled as “classic IPR leaders”.

For the other two blocks of countries, I draw on the analysis by Maskus (2012). In his analysis of the Ginarte-Park index on patent rights – that is often used to identify the domestic IPR regulation and compare it internationally – Maskus (2012) shows that India

(265%), China (207%), Taiwan (198%), Mexico (186%) and Brazil (181%) percentage-wise have seen a vast rise in patent protection. Furthermore, he creates two groups of countries: countries recently increasing their IPR protection for various reasons, and countries that *"have achieved major increases in per capita incomes and have transformed their economies into producers and developers of high-technology goods and sophisticated business services"* (Maskus 2012, 29–30).

The second block of countries consists of those countries that have seen a strong increase of patent protection over time and have a substantial market, which are Brazil, China, India, and Mexico. Going forward, this block of countries is called "recent IPR regulators" (see *Table 19* for the number of PTAs for this category).

The third block is termed "new IP producers and developers" and consists of Israel, South Korea, Singapore, and Taiwan, that today all have stringent IPR protection in place (see *Table 20* for the number of PTAs for this category). *Table 17* summarises the country selection based on Maskus (2012) according to their IPR-relevant grouping. These blocks of countries are used for the following graphs in this subchapter.

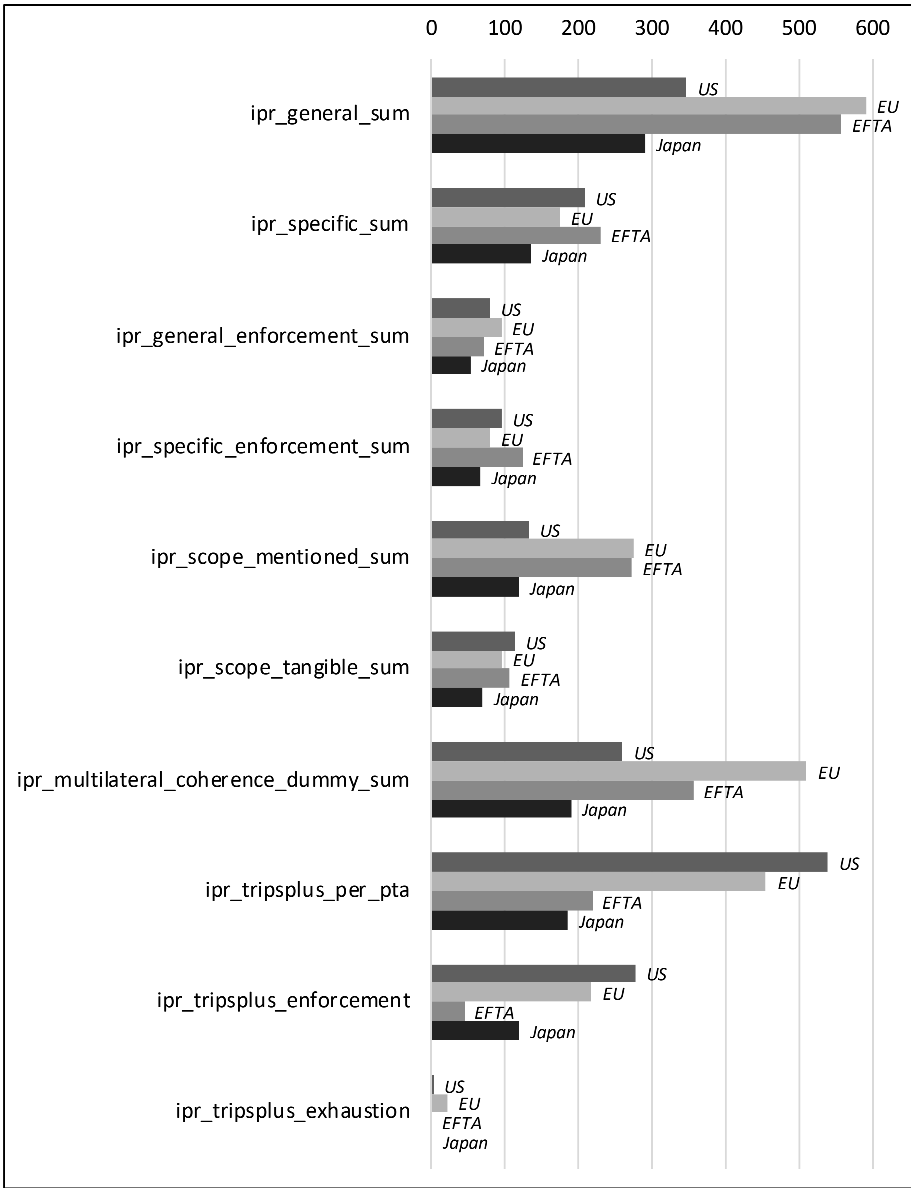
Table 17: IPR Country Selection Criteria

Country	Classification
US	Classic IP leaders
EU	Classic IP leaders
EFTA	Classic IP leaders
Japan	Classic IP leaders
Brazil	Countries with a high increase of patent protection
China	Countries with a high increase of patent protection
India	Countries with a high increase of patent protection
Mexico	Countries with a high increase of patent protection
Israel	New IP producers and developers
South Korea	New IP producers and developers
Singapore	New IP producers and developers
Taiwan	New IP producers and developers

The subsequent graphs will show the summarised descriptive statistics for each selected block. The detailed PTA-level scores on the indexes are listed for each country in the appendix (*Appendix 5* to *Appendix 16*).

Graph 14 illustrates the sum for the indexes for the classic IP leaders the US, EU, EFTA, and Japan.

Graph 14: IPR Indexes by Classic IP Leaders



It shows that there is an immense variation between the IP leaders' preferences of IPR regulation. Whilst the EU and EFTA by far spread the most general IPR provisions through PTAs, the US is the country scoring highest on the overall TRIPS-plus index and TRIPS-plus enforcement index. This implies that the US is the country including most consistently and to the largest extent provisions that go beyond the TRIPS requirements of intellectual property protection. The EU is the one including the most provisions on

IPR multilateral coherence, whereas EFTA scores highest on the specific IPR index summarising the index on tangible IPR scope and specific enforcement. The EU is thus consistently promoting other fora of IPR regulation through PTAs, whilst the EFTA members are including specific regulations in their PTAs. Japan scores lowest on all indexes except on the index of TRIPS-plus enforcement, where it is undercut by EFTA. *Graph 14* shows that even among this small group of countries with supposedly similar intentions for IPR regulations the manner of including them in PTAs varies substantially.

Bearing in mind that *Graph 14* draws on the sum of provisions across the dataset without considering the number of PTAs per country, it becomes evident that even though the US has only around half of the number of EFTA's PTAs and a fourth of the EU's PTA, the US ranks highest on the overall TRIPS-plus and the TRIPS-plus enforcement index. The sum of indexes allows to visualise the global impact of each country group. However, it might distort the actual content of PTAs from the specific countries as their quantity of PTAs varies substantially. Thus, *Table 18* shows the average on the indexes taking into account the number of PTAs per country.

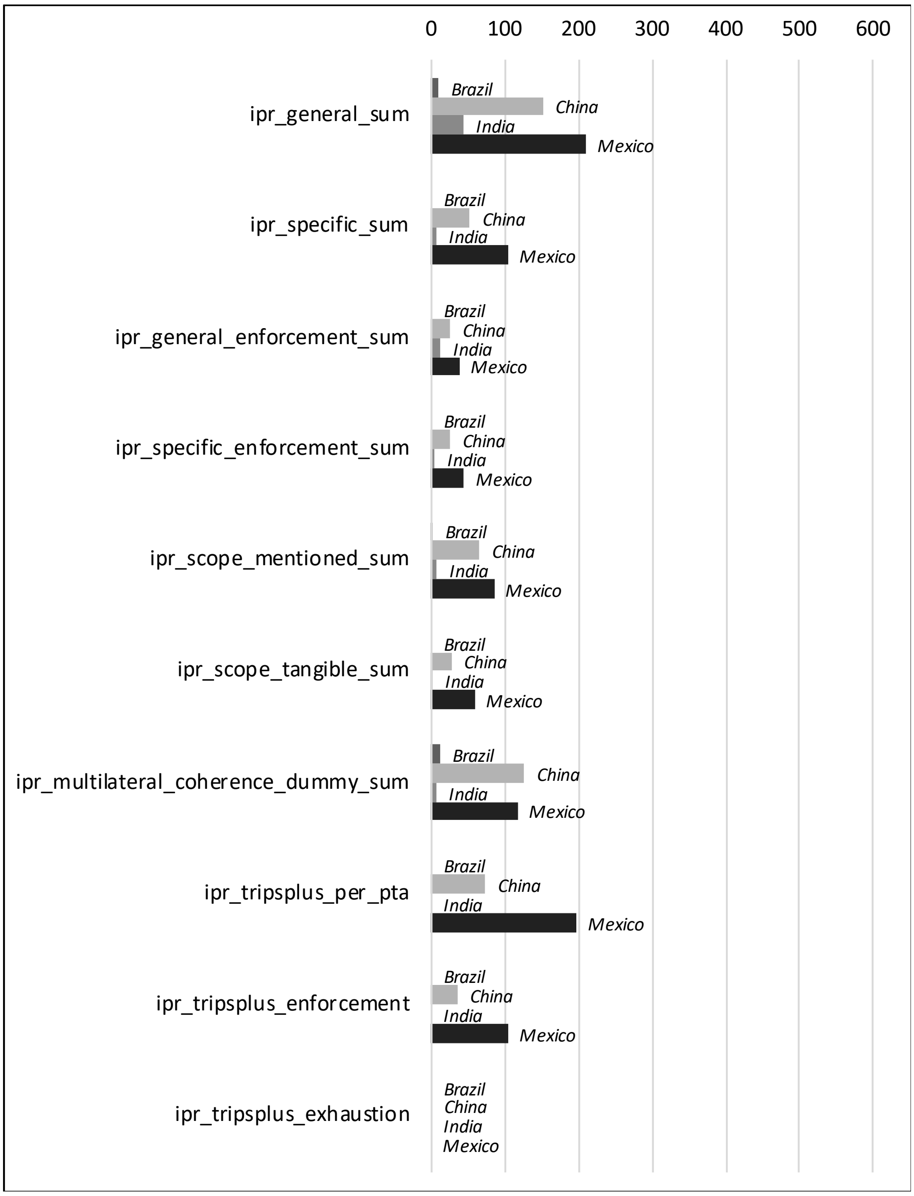
Table 18: IPR Indexes by Classic IP Leaders (average per PTA)

Sum of Indexes per Number of PTAs	**US** (N=23)	**EU** (N=95)	**EFTA** (N=42)	**Japan** (N=17)
ipr_general_sum	15	6	13	**17**
ipr_specific_sum	**9**	2	5	8
ipr_general_enforcement_sum	**3**	1	2	**3**
ipr_specific_enforcement_sum	**4**	1	3	**4**
ipr_scope_mentioned_sum	6	3	**7**	**7**
ipr_scope_tangible_sum	**5**	1	3	4
ipr_multilateral_coherence_2	**10**	5	7	**10**
ipr_tripsplus_per_pta	**23**	5	5	11
ipr_tripsplus_enforcement	**12**	2	1	7
ipr_tripsplus_exhaustion	0	0	0	0

This changes the picture somehow as unlike in *Graph 14* both the US and Japan score highest for all indexes when looking at the average IPR content per PTA. The only index where the score of Japan is equalled by EFTA is the mentioned scope of IPR areas, where on average both Japan and EFTA include seven IPR areas. Out of these four country groups, the US is very clearly the country regulating TRIPS-plus the most and on average includes 23 TRIPS-plus provisions per PTA. This reflects the same results for TRIPS-plus as seen in *Graph 14*.

These differences in *Graph 14* and *Table 18* have a number of implications. Firstly, they suggest that Japan and the US have a more consistent strategy on IPR regulations than the EU and EFTA. Even though the EU and EFTA agreements sum-wise include the most on certain IPR regulations (*Graph 14*) that is not the case when looking at it relatively to their number of PTAs (*Table 18*). This implies that EFTA and the EU have more variation across their PTAs regarding the IPR regulation. Secondly, *Table 18* shows that both Japan and especially the US are moving towards a maximum standard of IPR protection well beyond TRIPS (see *Figure 7: Diverging Ideals of IPR Standards*).

Graph 15: IPR Indexes by Recent IPR Regulators



Looking at the second group of countries with a high increase in patent protection in *Graph 15*, it is clear, that they include much less IPR provisions than the first block of countries. They continually score lower than the IPR leaders except for Mexico on TRIPS-plus provisions compared to Japan. And none of these countries contains provisions on TRIPS-plus exhaustion matters. Among Brazil, China, India and Mexico, there are mostly China and Mexico including a substantial sum of IPR provisions in their PTAs.

When looking at their PTA-relative IPR regulation in *Table 19*, the relations remain stable as still China and Mexico dominate each index. However, the PTA average shows that the IPR regulations of China and Mexico are much more like the ones of the previous block than anticipated based on *Graph 15*, especially to the EU. Brazil includes next to none IPR provisions in its PTAs, and the PTA average is thus rendered to nil. India includes similarly few IPR provisions, yet contrary to Brazil tends to include at least general provisions on IPRs. Both China and Mexico generally include TRIPS-plus provisions, and although they tend to include only one provision on general and specific enforcement, they both include multiple TRIPS-plus enforcement provisions. Nevertheless, the enforcement provisions for all four countries seem particularly low at one per average PTA besides the TRIPS-plus enforcement provisions.

Table 19: IPR Indexes by Recent IPR Regulators (average per PTA)

Sum of Indexes per Number of PTAs	**Brazil** (N=30)	**China** (N=17)	**India** (N=20)	**Mexico** (N=33)
ipr_general_sum	0	**9**	2	6
ipr_specific_sum	0	**3**	0	3
ipr_general_enforcement_sum	0	**1**	**1**	**1**
ipr_specific_enforcement_sum	0	**1**	0	**1**
ipr_scope_mentioned_sum	0	**4**	0	3
ipr_scope_tangible_sum	0	**2**	0	**2**
ipr_multilateral_coherence_2	0	**6**	0	3
ipr_tripsplus_per_pta	0	4	0	**6**
ipr_tripsplus_enforcement	0	2	0	**3**
ipr_tripsplus_exhaustion	0	0	0	0

Graph 16 shows that the third block of new IP producers and developers scores higher than the second group on the IPR indexes, yet lower than the first block of classic IPR leaders. Out of the countries in this group, South Korea and Singapore score highest on all indexes. Taiwan scores constantly low except for the index IPR general, whereas Israel

additionally has a substantial sum on the mentioned IPR scope. South Korea and Singapore score relatively high on the IPR multilateral coherence, the overall TRIPS-plus and the TRIPS-plus enforcement index, even though their sum of tangible IPR provisions is low compared to the countries out of the first block. This is astonishing as *Graph 11: Development of IPR Provisions by Region (NN-NS-SS)* shows that specific IPRs – consisting partially out of the tangible IPR scope variables – and TRIPS-plus provisions follow a highly similar development over time.

Graph 16: IPR Indexes by New IPR Producers and Developers

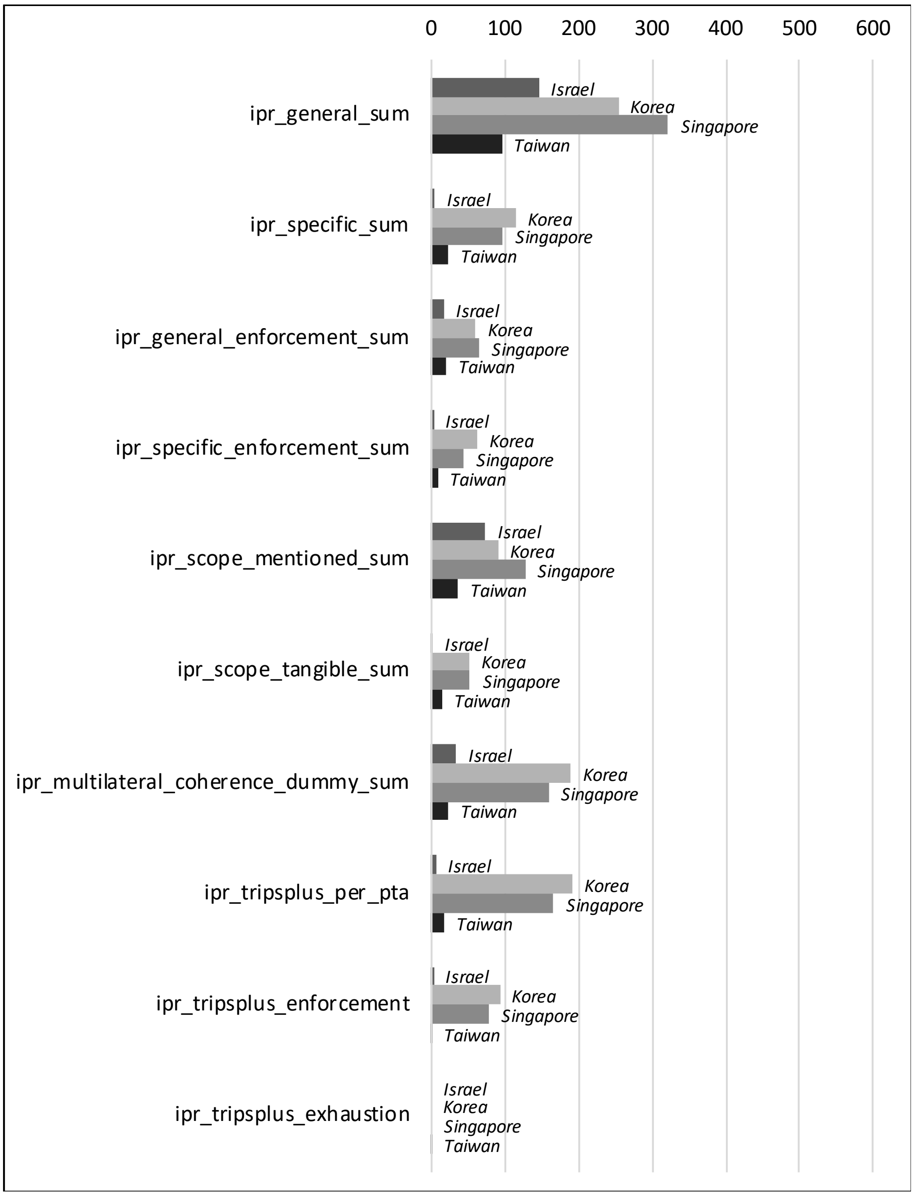


Table 20 highlights that South Korea and Taiwan score highest on the IPR indexes per PTA, which is inconsistent with *Graph 16*, where Singapore and not Taiwan shows

besides South Korea the highest sums of IPR provisions. South Korea scores exceptionally high on TRIPS-plus provisions and includes in an average PTA nine TRIPS-plus provisions, followed by Singapore with five provisions and Taiwan with three provisions per PTA. South Korea also scores comparatively high on the IPR multilateral coherence index and includes on average references to seven IPR conventions. On average, none of these countries includes anything on TRIPS-plus exhaustion, yet the detailed coding shows that Taiwan includes a national exhaustion provision for copyrights in the agreement between Panama and Taiwan signed in 2003.

Table 20: IPR Indexes by New IPR Producers and Developers (av. per PTA)

Sum of Indexes per Number of PTAs	**Israel** (N=20)	**South Korea** (N=21)	**Singapore** (N=33)	**Taiwan** (N=6)
ipr_general_sum	7	12	10	**16**
ipr_specific_sum	0	**5**	3	4
ipr_general_enforcement_sum	1	3	2	**4**
ipr_specific_enforcement_sum	0	**3**	1	2
ipr_scope_mentioned_sum	4	4	4	**6**
ipr_scope_tangible_sum	0	2	2	**3**
ipr_multilateral_coherence_2	1	**7**	4	3
ipr_tripsplus_per_pta	0	**9**	5	3
ipr_tripsplus_enforcement	0	**4**	2	0
ipr_tripsplus_exhaustion	0	0	0	0

The three blocks illustrate that there is substantial variation in-between countries approach on regulating IPRs (shown in the tables) and their global reach through the sheer amount of PTAs they sign (shown in the graphs). Whilst some have a consistent strategy and score high or low on both charts, others appear to have either less reach than anticipated by only being part to a couple of agreements or an inconsistent strategy on IPR regulation lowering their average score through their variation across PTAs. To explore the reasons for these variations, the next chapter analyses the design of IPRs in PTAs in more detail.

The following chapters use the dataset to analyse the variation in the design, and the effects of IPRs in PTAs. Depending on each topic, the dataset is adapted, and additional data added. More details on the data used for each analysis can be found in the respective subchapter.

Chapter 4: Design of Intellectual Property Rights in PTAs

The dataset shows that there is significant variation in the way countries regulate IPRs through PTAs. The term *design* circumscribes the variation of the content of intellectual property provisions in trade agreements, i.e. how the IPR provisions in PTAs are drafted. While some agreements include no provisions on IPRs, others include general regulations, specific provisions or even go beyond the comprehensive IPR regulation standard of TRIPS in their regulation efforts. The design of IPRs in PTAs thus focuses on the variations in the IPR commitments through PTAs and this chapter on the analysis of the causes of the broad differences in IPR provisions.

There already has been substantial research on the design of PTAs focusing on features such as dispute settlement and investment (Allee and Elsig 2015; Baccini and Dür 2015), and research classifying the design of PTAs according to, for example, the level of detail and the overall obligation of provisions, i.e. the depth of the PTAs (Dür, Baccini, and Elsig 2014), or the flexibilities of provisions (Kucik 2012).

The design of IPRs in PTAs has been analysed in detail, yet predominately from the angle of creating descriptive statements for small-n comparisons, and thereby mostly zeroing in on the PTAs of one country. While the descriptive analyses and case studies are useful to study specific PTAs, they fall short in generating findings that can be generalized and allow reliable comparisons of the approaches of IPR regulations across countries. Besides the descriptive studies, the few empirical analyses mostly draw on an oversimplified IPR content of PTAs such as the existence or absence of an IPR chapter in the PTA. This used to be a common approach for the analysis of trade agreements:

> "*A substantial proportion of the existing literature on PTAs consists of either case studies that fail to put the key features of a specific PTA into a broader context or quantitative studies that operationalise PTAs in the form of a dichotomous variable, that is, a variable that only captures the presence or absence of a PTA*." Dür und Elsig (2015, 2)

The usage of the binary approach to reflect the IPR content of a PTA is in thus far problematic as the design of IPRs in PTAs shows high variation, which suggests that it matters to countries what IPR provisions are included or excluded from PTAs. Without more detailed information on the IPR content, the reasons for the differences cannot be analysed and explained. Furthermore, studies on the effects of IPRs in PTAs might be skewed or biased as without detailed coding the observable effects about correlations will be unprecise (see *Chapter 5: Effects of Intellectual Property Rights in PTAs*). The previous analyses thus lack the tools for a systematic and comprehensive analysis of the design of IPRs in PTAs. Now that we have a systematic dataset on IPRs in PTAs, it is essential to understand the mechanisms behind these variations in design and try to explain what influences the variations in the design of IPRs in PTAs.

There exist plenty of assumption and expectations on the design of intellectual property rights in PTAs. For example, a reoccurring argument ever since the TRIPS negotiations is, that industrialised countries with major IPR industries strong-armed other countries into accepting more stringent IPR regulation in trade agreements. Another one is that developing countries concur to more stringent IPR provisions only if they gain market access rights in return.

Yet another argument postulates, that the preferences for the design of IPRs in PTAs does not only depend on the development stage of a country but is rather based on the specific country's preferences. For example, Deere (2009, 114–15) states that after TRIPS was signed, "*major economic powers shared many objectives. Both the United States and the European Union wanted, for instance to extend TRIPS patent protection to plant biotechnology, plants, and animals. But the major powers also had some distinct priorities. While the European Union favoured the extension of protection for geographical indications beyond wines and spirits, the United States and Australia opposed this agenda. Further, Canada, which like developing countries was a net importer of IP, was the only developed country that actively intervened to defend some particular TRIPS flexibilities*." To analyse how accurate such statements on countries preferences can predict the design of IPRs in PTAs, it is important to have a comprehensive dataset on IPRs in PTAs to test them. Furthermore, it is necessary to analyse the design of IPRs in PTAs from a broad theoretical perspective as there are diverging theoretical expectations leading to multiple and ambiguous explanations for the rationale of including IPRs in PTAs. A comprehensive theoretical approach allows to better understand the main drivers and identify different types of rationales, which makes it possible to explain why similar countries act differently resp. dissimilar countries behave alike.

As elaborated in *2.2.1.3 Rationale of IPRs in PTAs*, there are different theories on the reasons for countries to include IPRs in PTAs. Of course, countries might include IPRs based on the rationale of IPRs, i.e. to avoid a market failure, foster an innovative environment and spur growth and welfare (see *2.2.1.2 Rationale of IPRs*), or the rationale of PTAs, i.e. to decrease trade barriers and harmonise regulations (see *2.2.1.1 Rationale of*

PTAs). Hence, countries might act based on the rationale of IPRs in PTAs and either aim to reinforce a minimum or maximum standard of IPR protection through including IPRs in PTAs (see *2.2.1.3 Rationale of IPRs in PTAs*). Furthermore, there might be other factors derived from GPE theories explaining a country's IPR design choice.

This chapter focuses on the connection between the rationale of IPRs in PTAs, GPE theories and the measurable factors on design variations. The focus lies on allocating general patterns for the rationale of IPRs in PTAs based on domestic characteristics. However, this chapter will not take into account attitudinal factors such as attitudes of PTA negotiators or the public towards IPRs or PTAs at a given time having a possible impact on the PTA. This chapter centres around the domestic trade-related aspects and proven reliable predictors of PTA design as found in the GPE literature.

The analysis of the design of IPRs in PTAs is especially important as their design impacts not only the PTA members but due to the non-preferential nature of IPRs in PTAs, the variation in the design of IPRs in PTAs also has global consequences. Thus even though PTAs are negotiated only among PTA members and reflect bilateral or multilateral preferences, their implications have international characteristics and influence IPR regulation beyond the group of PTA members. It is thus necessary to analyse what drives the design of IPRs in PTAs in order to understand why and in what direction global IPR regulation is heading. So the question remains, why countries prefer to include a certain IPR commitments over another and what level of IPR protection they are willing to include in PTAs. The design analysis can thus improve both the academic research approach by looking at the mechanisms behind design preferences and moving beyond the effect analysis, as well as provide policy makers with evidence-based arguments.

In the previous chapter, I provided descriptive statistics based on my dataset, which provides insights on the content of IPRs in PTAs, whilst in this chapter, I provide some explanations on the design preferences. Firstly, I draw on GPE theories, the rationale of IPRs in PTAs, and more general PTA and IPR arguments for treaty design to derive hypotheses on design choices of IPRs in PTAs. Secondly, I use the dataset of IPRs in PTAs, use the coded variables as well as create new indexes that allow to test the hypotheses. Thirdly, I analyse the data and discuss the findings for the hypotheses and discuss how well the hypotheses hold. Lastly, I conclude and summarise by reflecting on the central insights gained on the design of IPRs in PTAs.

4.1 Design: Theoretical Context and Hypotheses

The basic assumption behind the design of IPRs in PTAs is that countries aim to include those provisions that reflect their IPR rationale. Following the rationale of IPRs in PTAs shown in subchapter *2.2.1.3*, I expect to find different patterns as some countries are in favour of more stringent IPR protection through PTAs whilst others are in favour of less IPRs in PTAs.

In theory, it is assumed that countries have a clear preference for IPR regulation and either aim towards a minimum or maximum standard of intellectual property regulation in PTAs. The underlying assumption is that countries voluntarily enter PTAs, and that negotiations happen between equal trading partners. Accordingly, it would be expected that the design of IPRs in PTAs follows a logical categorisation, which elaborate in the following two paragraphs.

Firstly, when PTA members with diverging ideals on IPRs enter into a PTA, then the design should reflect the middle ground between members aiming for a minimum IPR standard as well as other members reaching for a maximum IPR standard, assuming that PTA partners have an equal influence on the PTA design. Therefore, when PTA members with opposing ideal enter a PTA, the IPR design will most likely range between general to some few specific IPR provisions and steer a middle course of both rationales.

Secondly, if countries pursuing similar IPR ideals enter into a PTA together, there are two anticipated scenarios. On the one hand, when partners striving for a minimum IPR standard sign a mutual PTA, then it is likely that the PTA will include predominately general IPR provisions, for example, repeating flexibilities granted in TRIPS, or these PTAs might not include any IPR provisions. In this instance, the overall level of IPR protection is anticipated to be kept on a very low level reflecting the preference of a minimum IPR standard. On the other hand, if both PTA members endeavour to establish a maximum IPR standard, then the design of IPRs is expected to be distinguished by specific IPR provisions or even TRIPS-plus provisions, as both partners aim for more stringent IPR protection and a maximum IPR standard. *Table 21* on the next page summarises these basic assumptions on the anticipated IPR design variations assuming that countries have a distinct preference for either a minimum or maximum IPR standard, and design the IPR section in PTAs according to their IPR ideals (see *Figure 7: Diverging Ideals of IPR Standards*).

Table 21: Expected Design Variations Based on IPR Ideals

IPR Ideals of Members	Direction of IPR Standard	IPR Provisions in PTA
Diverging IPR ideals	Mediocre IPR standard	General, few specific IPR provisions
Similar IPR ideals	Minimum IPR standard	None or only general IPR provisions
	Maximum IPR standard	Specific IPR and TRIPS-plus provisions

However, these are not the scenarios reflected in the data on IPRs in PTAs. For example, the US aims towards a maximum IPR standard, yet negotiates its agreements predominately with countries that presumably fall into the opposing category of the IPR ideal. If countries negotiated strictly based on their IPR ideals and can negotiate PTAs freely and equally, I would expect that IPR is regulated in the middle of both ideals when countries are preferring a minimum IPR standard sign a PTA with the US reaching for a maximum standard. Such agreements with the US are, nevertheless, not as general on IPR regulation as I would expect when countries with diverging ideals negotiate an agreement. Moreover, the US agreements seem to follow an apparent, consistent path on IPR regulation according to the IPR preferences of the US, seemingly regardless of the PTA members.

On the other hand, agreements with PTA members that likely have the same ideal on IPR regulation also do not reflect these similarities in the design of IPRs in PTAs. Industrialised countries tend to prefer a maximum standard of IPR protection as the citation from Deere (2009, 114–15) implies above whereas countries of the south category are said to be pursuing a minimum IPR standard due to their small domestic IPR production. This goes hand in hand with the reoccurring argument that the preference of IPR ideals follows the north-south divide (see *2.2.1.3 Rationale of IPRs in PTAs*). According to these assumptions on north-south ideals and the relationships laid out in *Table 21*, north-north PTAs would be expected to include specific and TRIPS-plus IPR provisions as both PTA members aim for a maximum standard of IPR protection. South-south PTAs, on the other hand, would be anticipated to include none or only general IPR provisions as both PTA members pursue a minimum standard of IPR protection.

Nevertheless, the data shown in subchapter *3.3.6 Descriptive Statistics Grouped by Region* likewise shows a different picture for these cases. For example, north-north agreements score notoriously low on IPR regulation and only nine out of 54 NN PTAs even include any specific IPR provisions. Contrary, recent south-south agreements often include specific IPR provisions (so far 53 SS PTAs, about as many as NN PTAs). This implies that either the regional classification into south PTA members aiming for a minimum IPR standard and north PTA members aiming for a maximum IPR standard is outdated, or that countries do not consequently follow their IPR ideals through PTAs. It further suggests that there might be other factors for countries to decide upon the design of IPRs in PTAs.

So, if countries do not regulate IPRs in PTAs according to their anticipated IPR ideals, what could explain a countries preference? The general theory laid out in *2.2.1.3 Rationale of IPRs in PTAs* falls short in explaining the actual outcomes and decision making of countries according to the dataset on IPRs in PTAs. Therefore, it is necessary to draw on alternatives theories to explain the design of IPRs in PTAs. In international relations, the theories of global political economy (GPE) have concerned itself with explaining international behaviour and proved to score high on explanatory power for explaining PTA negotiations and outcomes (see *2.2.2 Global Political Economy Theories*).

The four main GPE theories predict countries behaviour based on different assumptions along of the two main lines of either international relation theories such as realism or in the tradition of focusing on domestic factors, influenced by neo-classical economics and interest group politics. Firstly, *realism* focuses on states' interests and assumes that power relations play an important role in international relations such as creating trade agreements (see *2.2.2.1 Realism*). Secondly, *liberalism* assumes that countries are interdependent and therefore prone to coordinate and cooperate if they want to protect their interests efficiently (see *2.2.2.2 Liberalism*). Thirdly, *social-constructivism* postulates that (social) norms such as ideas and identity influence international relations and trade agreements are not only defined by power relations or domestic interests (see 2.2.2.3 *Social-constructivism*). And fourthly, *modern marxism* states that countries are driven by a class struggle, that in international relations is represented by the north-south divide whereby developed countries aim to protect their interest and further their economic dominance (see *2.2.2.4 Modern Marxism*).

These theoretical GPE arguments have been used to explain PTAs and further developed to give some insights to countries preferences on the design of PTAs. In subchapter *2.2.2 Global Political Economy Theories*, I laid out the possible implications for IPRs in PTAs, and in the subsequent section, I will elaborate on these GPE explanations to explain the design of IPRs in PTAs. Additionally, I draw on other existing theoretical and empirical findings on PTAs, IPRs and IPRs in PTAs that could shed some light on countries' design preferences. However, the arguments are not always exclusively used by a specific GPE theory, but by multiple ones and often differ only by the underlying assumption of the behavioural mechanism of countries. Simplified, an argument can be made by realism arguing countries act a certain way based on a power rationale, liberalism would argue it is due to their interests, marxism based on a class-struggle, and social-constructivism due to ideas. Furthermore, certain arguments are not revisited as there exist no comprehensive data to analyse the postulated effects. For example, there is no domestic data on attitudes or beliefs on intellectual property, making assumptions about ideas and beliefs and thus social-constructivism difficult to analyse. The following arguments are thus largely based on previous research and only include measurable factors.

One of the key explanatory factors provided by GPE realist-type theory to explain a countries preference in international relations is power respectively power asymmetries (*realism*). For trade relations, the most apparent characterisation of power is the economic capacity of a country. However, PTAs are formed in a negotiating process that includes economic power and go beyond it. Dür and Mateo (2010, 565) deduct that the "*bargaining power in international negotiations stems from three sources: (1) the overall power resources of a country, (2) the best alternative to negotiated agreement (BATNA) and (3) the constraints imposed upon governments by domestic ratification requirements.*" According to Dür and Mateo (2010, 565), the PTA negotiations process can thus be described by realism arguments (argument 1 and 2), as well as liberalism arguments of domestic interests and their constraints (2, 3). These arguments could also prove to be explanatory for the design of IPRs in PTAs.

In the following subchapters, I will, therefore, explore the effect on the design of IPRs of economic and political power by looking at *Economic Power Asymmetry* (*4.1.1*) and *Political Pressure (US-specific)* (*4.1.2*). Furthermore, I will analyse the BATNA argument by looking at the way countries use PTAs instead of other fora of IPR regulation under the label of *Regime Preference* (*4.1.6*), that finds support in both the realism and institutional liberalism theory. Subsequently, I will test the influence of domestic constraints by looking at *Veto Players* (*4.1.4*) on the design of IPRs in PTA which is also associated with the liberalism.

Besides the power argument, regime preferences and domestic constraints, the next key factor in explaining the design of IPRs in PTAs are domestic interest. As the interventionist liberal theory suggests, domestic interests are a key factor for countries to intervene in the market and regulate through trade agreements (*liberalism*). I will thus analyse how *Domestic Interests* are likely to shape the design of IPRs in PTAs (*4.1.3*).

Of course, there are also IPR specific assumptions on countries preferences of PTA regulation. Biadgleng and Maur (2011, 3 et seqq.) allocate six reasons why countries choose to regulate IPRs through PTAs. In the following paragraphs, I describe these six arguments and connect them, where possible to a GPE theory and the argument I focus on for the analysis of IPR design. For those arguments not used in my analysis, I elaborate later on why they are not considered for the theoretical background.

Firstly, PTAs are an ideal forum for innovation, i.e. a forum ideally suited for new regulatory approaches as the bilateral compared to the multilateral approach allows for possible amendments and later adaptions through comparably easier bilateral renegotiations (*liberalism*). I include this argument in the discussion on *Regime Preference* (*4.1.6*).

Secondly, PTAs are attractive as in some cases there is a substantial asymmetry between PTA members, which allows the stronger PTA member to pursue their regulatory preferences. Moreover, PTAs allow a more systematic and agenda-setting approach on the member selection than international fora (*realism*, *marxism*). The few numbers of PTA members simplifies the negotiations on IPR regulations (collective action argument by *liberalism*). These arguments are included in the analysis of *Economic Power Asymmetry* (*4.1.1*), *Political Pressure (US-specific)* (*4.1.2*) and *Veto Players* (*4.1.4*).

Thirdly, PTAs include trade-offs, i.e. PTA members have a broader palette of possible concessions in turn for their preferred IPR regulation through the bargaining processes on different topics (*realism*; see Baccini, Dür, and Elsig 2015). This argument is part of the *Economic Power Asymmetry* (*4.1.1*).

Fourthly, PTAs sometimes include specific provisions to regulate cases of non-compliance by a "withdrawal of concessions". Thus PTAs sometimes offer more options to deal with the consequences of not implementing or enforcing IPR provisions and especially in the cases of a trade-off on IPRs, PTAs provide effective trade retaliation means through the possibility of nullifying other concessions (*realism).*

Fifthly, PTAs offer an alternative form of dispute settlement and depending on the perspective might offer more or less attractive DSMs than other fora. Sixthly, PTAs give space to use soft law, i.e. include IPR commitments that leave certain flexibility on the concrete implementation (*liberalism*). Such commitments are less binding, but also acceptable to a broader audience than stringent IPR provisions (see Biadgleng and Maur 2011, 3 et seqq.).

These assumptions made by Biadgleng and Maur (2011) are similar to the generalised bargaining power theory by Dür and Mateo (2010), that already postulate the influence on the design of IPRs in PTAs by power and the forum-choice of IPR regulation. Another of the additional arguments by Biadgleng and Maur (2011) on trade-offs is already part of the explanation in the argument of the *Economic Power Asymmetry* (*4.1.1*). The other factors are not included due to individual incompatibilities laid out in the following paragraphs.

The fourth argument by Biadgleng and Maur (2011) on the influence of withdrawal provisions has no corresponding variable in my dataset, and I have not encountered any article directly relating IPR with withdrawal rights during my coding process. Rather, the possibility to use withdrawal as a bargaining chip in disputes is related to the choice of PTA as a regulation forum for IPRs and cannot per se explain the design of IPRs. Of course, IPR retaliation is notably useful for countries being faced by trade discrimination of a more powerful and IPR producing PTA partner. There are already a couple of examples, where countries used the suspension of IPR protection for copyright, industrial design and geographical indications to country trade discrimination such as Ecuador against the EU preferential banana import regulation (WTO Dispute Settlement (DS) Case 27), Brazil against the US cotton subsidies (DS 267) and Antigua against the US cross-border gambling regulation (DS 285) (Maskus 2012, 110–11). However, as an argument for design features such as stringent IPR provisions, it holds little explanatory power. The choice of PTAs a preferred forum of IPR regulation is already covered through the BATNA argument by Biadgleng and Maur (2011) (see *4.1.6 Regime Preference*).

The fifth argument by Biadgleng and Maur (2011) on DSM seems not particularly relevant for IPR regulation. Few agreements include IPR-specific DSM provisions (29 PTAs out of 724 resp. 689 PTAs). Indirect DSM protection through the investment definition, i.e. where IPR is defined as investment and the investment chapter includes predominately an investor-state DSM, can be found more often (88 PTAs out of 724 PTAs resp. 86 out of 689 PTAs), but their enforceability has so far not been tested in practical cases. It remains to be seen how the legal system would deal with such cases and the argument of a deliberate inclusion of such indirect DSMs in order to include more beneficial DSMs is so far merely theoretical.

For their sixth argument on soft law and flexibility (Biadgleng and Maur 2011), my dataset does not include any matching variables as I refrained from coding the legal layers of the specific provisions. However, adding the legal bindingness to the coded commitments should be considered by future researchers.

Summarising, I use the theoretical arguments made by Dür and Mateo (2010) and the assumptions made by Biadgleng and Maur (2011) to allocate at least one argument per GPE theory. As previously stated, some of the arguments can be categorised for multiple theories, depending on the postulated underlying rationale. I only list the most apparent connections between theory and argument.

For realism, I include arguments on economic power asymmetry and political pressure. For liberalism, I cover arguments on domestic interests and veto players. For marxism, I mainly include the argument of political pressure, but some of the other factors such as domestic interest could also be looked at from a class perspective. For social-constructivism, I look at the argument of regime preference, which is most likely to represent a shared belief by pursuing a multilateral IPR regulation approach through PTAs or refraining from it.

Besides the theoretical arguments developed above, there are two more logical consequence of policymaking. The first one is, that if countries can agree on stringent provisions in the PTA than this will also be true for the IPR chapter. The more common ground PTA members have, the more likely it is that they can also agree on stringent IPR standards. The design of IPR provisions would thus be a reflection of the overall PTA commitments and result from a PTA endogeneity effect. I follow up on this arguments and analyse the possible effects of *Endogeneity* (*4.1.5*). The second argument is that countries base the design of IPR provisions on their previous experience and include those provisions that have proven to be adequate and that they deem necessary to repeat. I will, therefore, include the analysis of the impact of *Path Dependency* (*4.1.7*). As regime preference and path dependency both use IPR provisions – either on commitments to other IPR fora or IPR provisions overall – they are understood as specific forms of endogeneity, and therefore follow in the order of argument after endogeneity.

Summarising the theory discussed here, the following subchapters analyse the influence on the design of IPRs in PTAs of *Economic Power Asymmetry* (*4.1.1*), *Political Pressure (US-specific)* (*4.1.2*), *Domestic Interests* (*4.1.3*), *Veto Players* (*4.1.4*), *Endogeneity* (*4.1.5*), *Regime Preference (4.1.6)* and *Path Dependency* (*4.1.7*).

4.1.1 Economic Power Asymmetry

The first factor in explaining the design of IPRs in PTAs is the **economic power asymmetry** of PTA members. It is an argument repeatedly used to explain why countries without a substantial domestic IP industry enter into trade agreements including stringent IPR provisions and can be derived from the GPE realism theory (see *2.2.2.1 Realism*). The idea is that powerful countries strongarm less powerful countries into accepting their ideals of IPR protection. This power in PTA negotiations can be defined as the "*concessions that an actor makes or, more loosely speaking, the 'influence' that the negotiation partner exerts*" (G. Schneider 2005, 672). Countries aiming for a maximum IPR standard, and thus highly stringent IPR protection, select PTA members that are less powerful than them in order to reinforce their ideal IPR regulation.

Hypothesis 1.1: The higher the economic power asymmetry between PTA members, the more stringent IPR provisions are included in PTAs.

However, besides conceptualising power through power asymmetry as the main explanatory power in trade negotiations, there are two other realist-type arguments why countries are expected to agree to more stringent IPR provisions if there exists a big enough power asymmetry between PTA members: market access and financial contributions.

Firstly, less powerful countries are required to accept more stringent IPR provisions in turn for access to the more powerful trading partners' market. According to the understanding of Roffe and Spennemann (2014, 439), "*developing countries tend to be demandeurs of PTAs mainly to gain better access for their goods and services to more affluent markets, but developed-country partners are those that push for the incorporation of strong IP rules in the belief that this is the way of reaffirming their technological competitive advantages.*" Biadgleng and Maur (2011, 4) argue that this was the case during the TRIPS negotiations, where "*for developing countries [...], there was a clear bargain between accepting TRIPS rules as part of a package offering further market access in agriculture and labour-intensive goods.*" The result of accepting more stringent IPR provisions than domestically preferred is thus not per se coercion as stated in the realism argument, but rather a trade-off: countries striving for a minimum IPR standard agree to stringent IPR provisions in turn for preferential access to economically powerful partners' market. Concerning IPR protection, the economically powerful countries are those most likely to aim for stringent IPR protection as there is a strong correlation between economic power and the cost-intensive IPR production. It is expected that PTAs with economically powerful partners offering a substantial tariff commitment are more likely to include stringent IPR provisions.

Hypothesis 1.2: The higher the economic power asymmetry between PTA members and the existence of substantial tariff commitments in the PTA, the more stringent IPR provisions are included in PTAs.

Secondly, it can also be the case that economically powerful PTA members use their economic contribution such as FDI or aid payments as leverage when negotiating PTAs. In line with this assumption, Manger (2009) found that FDI is a strong motivator for developing countries to negotiate PTAs and agree to stringent provision on, for example, IPRs pushed by financially more powerful trading partners. For instance, US FDI was already present before NAFTA came into force and Manger (2009, 70 et seqq.) stated that US FDI providers played a crucial role in shaping the NAFTA negotiations. Moreover, the dependency of Chile on FDI has led to stringent IPR protection in the agreement with the US (Manger 2009, 182) as well as the PTA with EU, targeting, for example, stringent regulations on geographical indications (Manger 2009, 233). The trade-off hereby is between stringent IPR provisions in turn for continuing financial investment. It is expected that regardless if the trade-off results in market access or financial contribution, the key factor is the economic power asymmetry between PTA members. Thus, the more significant the economic power asymmetry in combination with financial contributions, the more likely are stringent IPR provisions in the PTA.

Hypothesis 1.3: The higher the economic power asymmetry and the financial commitments between PTA members, the more stringent IPR provisions are included in PTAs.

The influence of trade-offs is an endogenous factor of the PTA and in this section only discussed in relation to economic power asymmetry. The isolated effect of PTA-endogenous factors is discussed further in subchapter *4.1.5 Endogeneity*.

4.1.2 Political Pressure (US-specific)

The second factor in explaining the design of IPRs in PTAs is **political pressure**. Unlike other countries, the US very clearly postulates their opinion on the IPR regulations, situations and developments in other countries. Since 1989, the office of the United States Trade Representatives (USTR) annually releases its assessment of other countries IPR regulation and classifies countries according to their alleged endangerment of intellectual property protection and enforcement in their "Special 301 Report" (Office of the United States Trade Representative 2018b). Depending on the release year, the report includes a different additional classification for example on monitoring or notorious markets, yet in general, the report list countries that are on the *watch list* or even the *priority watch* list by the US. For example, in the 2018 report, there are 24 countries on the *watch list* such as Saudi Arabia, Switzerland and Thailand, and twelve countries are on the *priority watch list* including China, Canada and Chile. Switzerland has only been on the watch list since 2016, whereas Chile has been either on the watch list or the priority list for all reports years except from 1993. The declared intention of the Special 301 Report by the US is to expose those countries that are not conducting themselves on IP measures according to the US interests, or as stated in the executive summary of the Special 301 Report 2018, it "*reflects the resolve of this Administration to call out foreign countries and expose the laws, policies, and practices that fail to provide adequate and effective IP protection and enforcement for U.S. inventors, creators, brands, manufacturers, and service providers"* (Office of the United States Trade Representative 2018a, 5). Furthermore, for all countries that have been on the priority watch list, the USTR develops actions plans that include benchmarks on adapting the IPR protection according to US interest. If those countries fail to meet these US benchmarks the US "*President may take appropriate action*" (Office of the United States Trade Representative 2018a, 82).

The US government uses the Special 301 Reports to put political pressure on countries to reform their IPR protection to be suitable to US interests. Assuming that it is no coincidence that the trade department is in control of the Special 301 Report, these reports are expected to have an influence on the design of IPRs in PTAs with the US. For instance, the Special 301Report of 2018 states that Thailand has been moved from the *priority watch list* to the *watch list* due to its commitments made on IPR regulation in the negotiations of the trade and investment agreement between the US and Thailand (Office of the United States Trade Representative 2018a, 10). The hypothesis for political pressure thus assumes that by including countries in the Special 301 Report, the US puts pressure on countries to comply with their domestic IPR interests. This pressure results in stringent IPR provisions in all US PTAs where one of the PTA members is on included in the Special 301 Report.

Hypothesis 2: If one of the PTA members are listed in the Special 301 report, the more stringent IPR provisions are included in PTAs with the US.

This hypothesis can only be tested reliably for the US as it is the only country consistently reporting its opinion on other countries' IPR regulation.

4.1.3 Domestic Interests

The third factor in explaining the design of IPRs in PTAs are **domestic interests**. When countries design their PTAs, they are expected to include provisions that protect and enforce their domestic interests. This is an argument that all GPE theories support except from social-constructivism (which sees not interest but a shared understanding/consensus as driver of a countries behaviour). For all other theories, countries are seen as either power-maximiser and therefore aiming to protect their economic interests and power through any means necessary (see *2.2.2.1 Realism)*; or countries see regulation as a key form to represent and facilitate domestic interests (see *2.2.2.2 Liberalism*); or countries cooperate with those partners that share their ideals of regulation (see *2.2.2.3 Social-constructivism*); or countries are used by IPR producers to strengthen their influence beyond the domestic borders and entrench their dominant position (see *2.2.2.4 Modern Marxism*). Consequently, we would expect countries that have a strong IPR industry to protect these interest in PTAs. The argument reflects the IPR ideals and provides an alternative classification to the north-south divide for countries aiming for a minimum or maximum IPR standard. The motivation of countries remains the same as shown in *Table 21: Expected Design Variations Based on IPR Ideals,* only the underlying mechanism is allocated to derive from domestic interest and not a necessary ideological motivation of countries. Following this categorisation, there are two main hypotheses.

It can be assumed, that the more distinct the domestic interests are of PTA members, the more general IPR provisions characterise the IPR design. Same as in *Table 21*, it can be assumed that both PTA members will be able to meet in the middle of their IPR interest, which will result in general provisions on IPR and maybe a few specific provisions.

It can thus also be argued that the more similar the domestic interest are among PTA members, the more extreme towards a minimum or maximum standard are the IPR provisions. Depending on the formulation of the domestic IPR interest, the corresponding IPR design will either be stringent for strong domestic IPR interests and less stringent or non-existent for those PTA members with weak domestic IPR interests. The underlying assumption is that states cannot be forced into acting against their interests and both PTA members influence the PTA design. However, as the similarity and dissimilarity of domestic interest across countries is a science in itself, valid hypotheses can only be posed on the measurable aspects of domestic interests. And seeing as the data suggest that – at least in the case of the north-south divide – IPR ideals might not be suitable to predict IPR design, it is important to consider an alternative explanation how domestic interests might shape the design of IPRs.

Based on the GPE structural realism and marxism arguments, countries could also be more impacted by the power of the domestic interests than assumed above. If the domestic interests are strong enough, then they could be able to force their home country into including certain provisions, that the other country must accept if they want to enter the PTA. Unlike with the economic asymmetry, there is not necessarily a trade-off between PTA members as structural realism assumes that power asymmetry itself suffices to explain international relations and marxism assumes that policymakers represent the will of producers. To reflect this for the analysis of PTA design, domestic interests are commonly represented by the opposed interests of exporters and importers. Exporters are expected to be lobbying for a PTA as they will gain improved access to a (new) market by entering a trade agreement, and importers against it as they are faced with additional competition from abroad by lowering the domestic barriers through a trade agreement. For instance, Kucik (2012) analysed the impact of domestic interest-groups on the flexibility in PTAs and found that the PTA design is influenced by the import-export constellation of interest groups in the domestic markets. He concluded that "*export-dependent (import-competing) markets enter into significantly more rigid (flexible) PTAs as their market power increases*" (Kucik 2012, 115). This illustrates that exporters are significantly more prone to stringent regulation in PTAs than importers. Also, it can be expected that the design of IPRs in PTAs is influenced by these findings as well. The first hypothesis for domestic interests assumes that where the domestic IPR exporting industry among PTA members is substantial, the more likely it is that the PTA includes stringent IPR provisions.

Hypothesis 3.1: The stronger the domestic IPR exporting interests are among PTA members, the more likely the PTA includes stringent IPR provisions.

Moreover, domestic IPR interests can also be analysed autonomously of trade flows and it can be assumed that already established IPR markets will lobby to expand their IPR rights into other markets via PTAs. Countries that already have strong IPR interest are more likely to also protect these interests in PTAs more stringently. For example, countries with a substantial number of registered trademarks or payments received for copyrights will try to ensure these rights or at least similar ones abroad through IPRs in PTAs. Similarly, countries encouraging or even subsidising research and development are more likely to protect these interest in intellectual property in trade agreements. The second hypothesis for domestic interest thus states that with increasing strong IPR interests of the PTA partners, the stringency of IPR provisions in the PTA also increases.

Hypothesis 3.2: The stronger the domestic IPR interests are among PTA members, the more likely the PTA includes stringent IPR provisions.

Both hypotheses include the underlying assumptions that strong domestic interests in IPRs would also increase the likelihood of general IPR provisions being included in PTAs.

4.1.4 Veto Players

The fourth factor in explaining the design of IPRs in PTAs is the political influence of **veto players** on PTAs. The concept of veto players is a common concept used in political science to account for the domestic constraints on a countries decision-making process.

> *"Veto players are individual or collective actors whose agreement (by majority rule for collective actors) is required for a change of the status quo. Two categories of veto players are identified in the article: institutional and partisan. Institutional veto players (president, chambers) exist in presidential systems while partisan veto players (parties) exist at least in parliamentary systems. Westminster systems, dominant party systems and single-party minority governments have only one veto player, while coalitions in parliamentary systems, presidential or federal systems have multiple veto players. The potential for policy change decreases with the number of veto players, the lack of congruence (dissimilarity of policy positions among veto players) and the cohesion (similarity of policy positions among the constituent units of each veto player) of these players."*
> Tsebelis (1995, 289)

This initial definition of veto players was mainly used to classify political systems based on the importance and number of actors, and thereby adding information in the cross-country comparison of democratic political systems. Over time, the concept of veto players was extended to reflect all relevant players besides institutional and partisan actors that influence the political decision-making process (see Allee and Elsig 2017, 538). The central concept used is the one developed by Henisz (2002), who groups veto players into the executive, legislative, judiciary and sub-federal units. Moreover, the number of veto players in a country is defined as the "*distribution of decision-making power among these actors and the extent to which their preferences diverge*" (E. D. Mansfield, Milner, and Pevehouse 2007, 404). The influence of domestic constraint represented by veto players on international relations is derived from the neoclassical realism argument and states that the domestic power relations influence, for example, trade negotiations (see *2.2.2.1 Realism*).

In regard to PTAs, the number of veto players has an effect on multiple stages of the negotiation process such as the design, signature, ratification, entry into force and implementation of PTAs. Generally, the veto player theory assumes that more veto players lead to a preservation of the status quo as it is more difficult to find a consensus among many actors than only a few (see Allee and Elsig 2017, 538). The underlying argument is that the number of veto players represents the diverging and not similar interests, and the rising number of veto players thus leads to a balance of interest around the status quo and not a concentration of power at an extreme position. Regarding the impact of veto players on PTAs, E. D. Mansfield, Milner and Pevehouse (2007) found in their analysis of PTAs of 194 countries that the probability of PTA decreases with the number of veto players in the PTA member countries, i.e. that more veto players among PTA members make PTAs less likely. Allee and Elsig (2017) went a step further and focused on the connection between the design of PTAs and veto players, and found that more veto players between PTA members lead to less ambitious provisions and especially less stringent dispute settlement provisions in PTAs.

This assumption is also adaptable to the design of IPRs in PTAs. By accommodating multiple preferences of veto players with opposing interests on IPR, the content of PTAs is presumably less stringent insomuch as consensus-based. As shown in *Table 21: Expected Design Variations Based on IPR Ideals*, it is expected that PTAs among PTA members with opposing IPR ideals are more likely to include provisions reflecting the middle ground between PTA members. Applied to veto players representing a multitude of interests, it is assumed that more veto players among PTA members lead to general IPR provisions in the PTA.

Hypothesis 4.1: The more veto players there are among the PTA members, the more general IPR provisions are included in the PTA.

For stringent IPR provisions, an alternative argument and causal mechanism might be better suited to explain their design. The more diverging IPR ideals exist in negotiations due to a high number of veto players, the more general are the anticipated IPR provisions and the less likely are stringent IPR provisions. Kim et al. (2016, 331) argue that stringent PTAs "*reduce the decision-making power of certain veto players (such as domestic legislature), increase the adjustment cost and the portion of society affected, and attenuate the ability of domestic groups to lobby the government*." Therefore, I expect that with an increase in the number of veto players, the amount of stringent IPR provisions decreases.

Hypothesis 4.2: The more veto players there are among the PTA members, the fewer stringent IPR provisions are included in the PTA.

However, when there are only a few veto players among PTA members then the design of IPRs in PTAs should also be distinctive. The fewer veto players the IPR design has to encompass, the easier it should be to find a consensus among those that prefer a maximum or a minimum IPR standard. Those PTAs with a low number of veto players are thus expected to lean towards either a minimum or maximum IPR standard, depending on the prevailing IPR ideal among veto players. For instance, if there are only a few veto players and a clear majority supports a maximum standard of IPR protection then the PTA most likely will include stringent IPR provisions and vice versa.

Hypothesis 4.3: The fewer veto players there are among the PTA members, the clearer the trend towards a maximum or minimum standard of IPR protection.

Furthermore, the number of veto players can have an impact on the included DSM provisions. E.D. Mansfield and Milner (2012, 18) argue that "*more integrative arrangements have more pronounced distributional consequences. Equally, the inclusion of DSM bolsters a trade arrangement's enforcement capacity. As the number of veto players rises,* *there is a growing likelihood that at least one such player will be adversely affected by greater integration and enforcement within the arrangement, reducing the likelihood that a country marked by a large number of veto players will enter a highly integrative arrangement or one with a DSM.*" As stated above, Allee and Elsig (2017) already tested this theory and found that there is a negative relationship between the number of veto players and dispute settlement mechanisms in PTAs. I will test this hypothesis for the DSM as well as enforcement of IPR in PTAs. The hypotheses state that the more veto players can be found among the PTA members, the less likely the PTA include DSM respectively enforcement provisions for IPRs.

Hypothesis 4.4: The more veto players there are among the PTA members, the fewer specific IPR DSM provisions are included in the PTA.

Hypothesis 4.5: The more veto players there are among the PTA members, the fewer IPR enforcement provisions are included in the PTA.

4.1.5 Endogeneity

The fifth factor in explaining the design of IPRs in PTAs is the **endogeneity** effect of PTAs. As already shown before, IPR provisions might be influenced by PTA external factors such as economic power asymmetries or domestic interests. However, it cannot be ruled out that the IPR provisions are influenced by other factors within the PTA, seeing that IPR provisions are only a small part of the overall PTA. The design of IPRs might, therefore, be influenced by other stringent commitments made in the PTA.

> *"Many modern regional trade agreements (RTAs) go beyond traditional trade issues, such as the liberalization of tariffs and quotas, and thereby represent examples of what has been coined "deep integration". These RTAs include trade issues that were incorporated in the multilateral trading system at the Tokyo and Uruguay Rounds, such as services, government procurement, intellectual property rights, sanitary and phytosanitary measures (SPS), and technical barriers to trade (TBTs). But some more recent agreements also extend to cover new trade-related policy areas that are, at least in part, on the Doha Development Agenda established at the Ministerial Meeting of the World Trade Organization (WTO) in Qatar in November 2001. In the WTO context, these policy areas are often referred to as the Singapore issues, because they were discussed at the 1996 WTO Ministerial in Singapore, and include transparency in government procurement, trade facilitation, investment and competition."* Reiter (2003, 62)

Nowadays, the “depth” of PTAs refers to both the expanded scope of topics in PTAs such as investment, competition or services, as well as the inclusion of a more stringent provision on existing standards such as substantial tariff cuts. Thereby the “depth” of a PTA is defined by the required changes resulting out of entering the PTA such as substantial reduction of tariffs or alterations through including IPR provisions compared to the status quo without entering the PTA (Downs, Rocke, and Barsoom 1996, 383).

If countries can agree on entering a “deep” PTA and thereby agreeing to substantial commitments, the probability that the PTA members can also agree on more “deep” IPR provisions increases. The stringent IPR provisions might thus result out of the overall consensus of PTA members and be endogenous to the PTA. The first hypothesis thus assumes that deeper PTAs are more likely to include stringent IPR provisions.

Hypothesis 5.1: The deeper the overall PTA, the more stringent IPR provisions are included in the PTA.

As stated for the hypothesis on economic power asymmetry (*4.1.1*), countries might agree to more stringent IPRs in turn for other commitments in the PTA. Hereby, the key argument is that countries agree to stringent IPR provisions in turn for improved market access. Unlike the assumption made for the economic power asymmetry (*4.1.1*), here, the economic situation is not taken into account as the driving force is assumed to reside within the PTA and not power asymmetry. The inclusion of “deep” market access provisions is thus expected to increase the likelihood of stringent IPR provisions.

Hypothesis 5.2: The deeper the market access provisions are in the PTA, the more stringent IPR provisions are included in the PTA.

Moreover, the previous analysis of endogeneity of PTA design has shown that other PTA-internal factors can impact the design of PTAs. For instance, Baccini, Dür and Elsig (2015) find that there is a high correlation between enforcement variables and the “depth” of the PTA, suggesting that countries prefer to include stringent provisions in combination with enforcement provisions. Applied to IPRs in PTAs, this implies that PTAs with IPR enforcement provisions are more likely to include stringent IPR provisions as well. After all, enforcement provisions give countries more regulatory certainty as they make the protection of IPR more likely and make the circumvention of IPRs less likely.

Hypothesis 5.3: The more IPR enforcement provisions are in the PTA, the more stringent IPR provisions are included in the PTA.

At the same time, specific enforcement provisions imply decreased flexibilities for countries legislation and increased implementation costs. According to Fink (2011, 396), "*the enforcement of intellectual property rights can be a costly exercise in terms of both budgetary outlays and the employment of skilled personnel. For developing countries that face many institutional deficiencies, there is a risk that stronger enforcement of IPRs would draw away financial and human resources from other development priorities.*" Assuming that at least one of the PTA members agrees to new provisions by including specific IPR enforcement provisions, this PTA partner will bear additional costs of implementing these provisions. Such provisions are therefore better suited where specific interest are protected as well. For example, the stringent provision on copyright enforcement are likely to be combined with stringent provisions on copyright protection. Thus, the nature of the enforcement provisions might also influence the stringency of the IPR commitments. Besides testing the effect of overall IPR enforcement on stringent IPR provisions, I will also test the effect of specific IPR enforcement provisions on stringent IPR provisions.

Hypothesis 5.4: The more specific IPR enforcement provisions are in the PTA, the more stringent IPR provisions are included in the PTA.

There are also other endogenous factors that can influence the design of IPRs in PTAs that are based on two main different assumptions: firstly, countries act based on their regime preference, and secondly, countries learning from each other or of their previous experiences with regulating IPRs through PTAs. As these arguments are based on independent theoretical debates, I will list them in separate subchapters, even though they are technically also endogenous factors. The first one is covered in subchapter *4.1.6 Regime Preference*, and the second in subchapter *4.1.7 Path Dependency*.

4.1.6 Regime Preference

The sixth factor in explaining the design of IPRs in PTAs is that countries act based on their **regime preference**. Countries can influence IPR law internationally by including IPRs in PTAs and states are able to establish their standards beyond their domestic borders by spreading IPR provisions through PTAs. Thereby, countries can choose, which forum they prefer to regulate IPRs (see *Figure 5: Fora of IPR Regulation*) and the motivation behind this choice is expected to have an impact on the design of IPRs in PTAs. I will refer to a countries choice of the legal forum as their ability to act based on their regime preference.

First of all, countries might choose not to regulate IPRs through PTAs. If countries do not want to regulate IPR, or if countries prefer a different fora of IPR regulation than PTAs, one option is not to include any IPRs in PTAs. The other option is to reinforce other fora of IPR regulation by including provisions in the PTA that reaffirm these other fora. For example, this can be achieved by including a commitment to accede to or reaffirm another IPR convention such as the Trademark Law Treaty or the UPOV Convention (see *3.1.2.4 IPR Multilateral Coherence Variables*). This is a tactic predominately associated with PTAs negotiated by the EU. Roffe and Spennemann (2014, 440), for example, state that in the EU agreements "*by and large there was an emphasis on reinforcing the existing international IP architecture by committing parties to adhere to multilateral IP-related agreements."* Furthermore, Allee et al. (2017 Table 5) even found that on average around 10.1% of the IPR content in PTAs is copy-pasted from the TRIPS agreement. This suggests that IPRs in PTAs are used as alternative device to spread and strengthen multilateral IPR regulation.

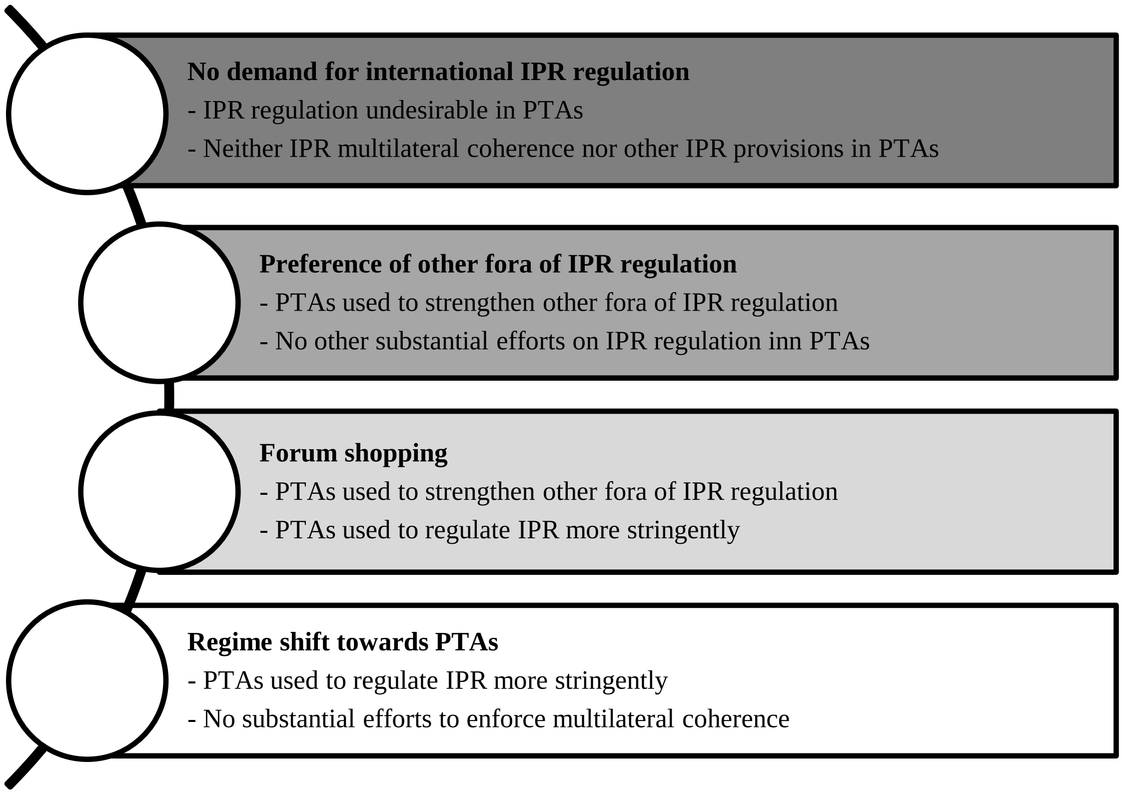
This line of decision making can be explained by the institutional liberalist argument, whereby stronger multilateral approaches of regulation are preferred over PTAs as the strengthen the international system of interests and thereby go beyond the short-term interests of countries (see *2.2.2.2 Liberalism*). After all, IPRs in PTAs are based on the negotiations between the PTA members and only represent this small group of countries, whereas, for instance, IPR conventions are negotiated in an international manner and represent a broader spectrum of international interest. By supporting and preferring such IPR conventions over IPRs in PTAs, the IPR regulation is based on a broader consensus than when countries create new IPR regulations on IPRs and include them in PTAs. For those PTAs where the PTA members prefer other fora of IPR regulation, it is thus expected that these PTAs will not include any stringent IPR provisions that would set a new, not internationally consensus-based IPR standard.

However, when countries decide to use PTAs for IPR regulation than there are two underlying theoretical assumptions: countries either act as "forum shoppers" or there has been a "regime shift" from other fora towards PTAs. When countries opportunistically switch between fora depending on where they can more efficiently include their ideal of

IPR protection, their behaviour is called "forum shopping" (see Allee and Elsig 2016). For instance, if a country is not satisfied with international negotiations on an IPR convention, it might choose to specifically target countries and regulate their preferred IPR regulations through PTAs instead. The same country might also want to achieve a broader standard of IPR protection for a specific area such as plant varieties and prefer to regulate IPRs for these topics through an international IPR agreement. This country thus switches between the different fora of IPR regulation depending on the prospect of achieving its own goals, and not per se prefers one forum over another. This argument can be derived from the classical realism theory, whereby institutions such as PTAs are mere mean to maximise own benefits, further own power and protect own interests (see *2.2.2.1 Realism*). According to Drezner (2004, 486, 2009, 67), the US and European countries applied this approach in regards to IPR protection online. In 1996, they pushed the two IPR WIPO conventions WCT and WPPT (see *3.1.2.4 IPR Multilateral Coherence Variables*), which include stringent IPR regulations and protect IPRs online. At the same time, the US and European countries include stringent IPR provisions targeting online matters within their PTAs. Such PTAs by forum shopping countries are thus expected to include stringent IPRs that countries were not able to regulate through other fora, and as these countries still value other fora of IPR regulation, it is anticipated that their PTAs will include a commitment to other IPR fora through IPR multilateral coherence commitments as well.

Besides switching between IPR fora, other theoretical research also suggests that there has been a general forum shift from international IPR regulation fora to regulating IPRs through PTAs (Helfer 2009). The assumption hereby is that countries, in general, are dissatisfied with the state of international IPR regulation and see more possibilities in negotiating IPRs among fewer member states. These countries, therefore, have turned their back on other fora of IPR regulation and now clearly prefer PTAs to regulate intellectual property. It is thus expected that these PTAs made by countries choosing to shift forums are more likely to include stringent IPR provisions and less likely to include any references to IPR multilateral conventions. *Figure 9* summarises these assumptions on the regime preference regarding the design of IPRs in PTAs. The following hypotheses are derived based on each of the predicted paths to be taken according to regime preference laid out in *Figure 9*. The assumption hereby is that these arguments reveal the relation between the level of IPR multilateral coherence and other IPR provisions in the PTA. The data will show, which argument is most reliable to predict the design of IPRs in PTAs.

Figure 9: IPR Design Motivations of Regime Preference



Firstly, countries might prefer not to regulate IPRs, or at least not through PTAs. This would concern IPR multilateral variables as much as other IPR variables. It is thus expected that the fewer IPR multilateral coherence variables go hand in hand with less other IPR variables in the PTA.

Hypothesis 6.1: The lower the commitment to IPR multilateral coherence in PTAs, the fewer IPR provisions are included in PTAs.

Secondly, there might be other preferred fora of IPR regulation and PTAs are used as a means to reinforce these other IPR regulation fora. According to this line of argument, PTAs thus include strong commitments on other IPR fora such as IPR conventions and are unlikely to include other stringent IPR provisions. Instead countries prefer to regulate stringently through other fora and will refrain from creating an alternative, possibly conflicting regulations through stringent IPR provisions in PTAs. Hence, if countries prefer other fora to PTAs, it is expected that higher commitments to IPR multilateral coherence mean that the PTA includes fewer stringent IPR provisions.

Hypothesis 6.2: The higher the commitment to IPR multilateral coherence in PTAs, the fewer stringent IPR provisions are included in PTAs.

Thirdly, for those countries that act as forum shoppers, I assume that their PTAs will include stringent provisions on both IPR multilateral commitments because they still deem these fora as valuable, as well as stringent IPR commitments, which they no success in regulating through other IPR fora. Such PTAs would thus imply a positive correlation between provisions on IPR multilateral coherence and other stringent IPR provisions.

Hypothesis 6.3: The higher the commitment to IPR multilateral coherence in PTAs, the more stringent IPR provisions are included in PTAs.

Fourthly, there has been a shift in the regime of IPR regulation when countries have turned from other fora of IPR regulation and now explicitly prefer PTAs to regulate IPRs. These PTAs should have a minimal amount of references to other IPR regulation fora, which are no longer relevant due to the regime shift. Moreover, these PTAs aim to be the new tools to set IPR regulation standards and are expected to include highly stringent IPR provisions. I expect that if a regime shift can explain the design of IPRs in PTAs, that PTAs with low commitments to IPR multilateral coherence include more stringent IPR provisions.

Hypothesis 6.4: The lower the commitment to IPR multilateral coherence in PTAs, the more stringent IPR provisions are included in PTAs.

4.1.7 Path Dependency

The seventh factor in explaining the design of IPRs in PTAs is **path dependency**. Haas (1990, 24) defines policy learning as a process where "*organization's members are induced to question earlier beliefs about the appropriateness of ends of action and to think about the selection of new ones, to 'revalue' themselves*", which then leads to a change in their behaviour. Whereas Haas (1990) applies policy learning primarily to the learning from others, I argue that for trade agreements, countries are most likely to learn from own previous experiences of PTAs.

The underlying assumption is that there is a path-dependency of PTAs, i.e. that the first PTA serves as some form of theoretical or even practical basis for the subsequent

PTAs and that every follow-up PTA increases the basis of a countries PTA toolkit. PTAs are not drafted in a vacuum and the previous experiences influence the newer PTAs. For example, Kim and Manger (2017) concluded that there is a path-dependency for the liberalisation approach countries chose in PTAs, and Postnikov and Bastiaens (2014, 929) found that Chile has learned from previous policies on labour made in their agreement with the EU and applied it to their PTA with South Korea.

Applied to IPRs, countries thus are expected to repeat those IPR provisions that they already included in a previous PTA and that have proven themselves, so-called best-practice provisions (see Lundvall and Rodrigues 2002). Besides repeating these best-practice commitments due to their merit and the want to enforce these provisions with other PTA members, the underlying motivation could also be that these repetitive commitments come at no cost. As they have already been included in a previous PTA, they should be already implemented into the domestic legislation of the country repeating a previous IPR commitment and due to the nature of IPR commitments is granted on an MFN basis to all other countries. There are no required adjustments and cost of including the same provision again for at least one of the PTA members. Allee and Elsig (n.d.) refer to this phenomenon of repeating PTA provisions as copy-pasting and show that this is a common approach for PTA design features. They find up to a 99% overlap compared to the most similar treaty and for intellectual property in PTAs an average PTA design overlap of 72% amongst 218 tested PTAs. However, this number of IPR copy-pasting is probably at least slightly skewed because of their data selection, which partially excludes the appendixes of PTAs. The appendixes are sometimes the main bodies of IPR regulation, whilst the PTA only contains general statements, for instance for EFTA agreements (see *3.2.1 Preprocessing and Coding of PTAs*). For example, the list on geographical indications of EU PTAs might seem comparable to tariff concession list and not comparable, yet they are necessary for identifying TRIPS-plus commitments. By partially excluding them, some of the variation in the IPR design is lost and the overlap might be overestimated. Nevertheless, the study by Allee and Elsig (n.d.) shows that PTAs are not constructed in a vacuum and there is most likely a substantial degree of copy-pasting happening for the IPR provisions.

What both motivations, be it best-practice or low-costs copy-pasting, have in common is that they replicate the previous design of IPRs in PTAs. Countries learn from their previous international policies, which I will refer to as “intra-country path dependency”.

The first hypothesis thus assumes that provisions, which a country has already included in one of its previous PTAs, are more likely to be included again in a later PTA.

Hypothesis 7.1: If the IPR provisions have been included in a previous PTA of at least one PTA member, the more likely these provisions are to be repeated in follow-up PTAs.

Moreover, it is anticipated that countries are more likely to repeat their general IPR commitments as these bear a lower implementation cost the other PTA member(s) than stringent IPR provisions. This might be also due to the assumption that general provisions are more likely to pass through the negotiations with new PTA members than stringent IPR provision (see *4.1.4 Veto Players*). However, such general provisions are less likely to have an identifiable effect than stringent IPR provisions and countries are thus most likely not acting based on a best-practice approach. Accordingly, the second hypothesis postulates that the less stringent and general the IPR provisions are in PTAs, the higher is the probability of them to be repeated in a PTA signed by the same country at a later stage.

Hypothesis 7.2: If general IPR provisions have been included in a previous PTA of at least one PTA member, the more likely these general provisions are to be repeated in follow-up PTAs.

Furthermore, countries are anticipated to learn not only from their experience but to draw from the experience of other countries. Path dependency can thus not only be restricted to domestic experiences and own PTAs. Rather countries can learn of the policies that other countries have made by including IPRs in PTAs and compare it to their own experience with IPR regulation, so-called "learning by comparing" (Lundvall and Rodrigues 2002, 203). Countries can learn from other previous international policies, which I will refer to as "international path dependency". However, I expect that this international path dependency would only take place in the case of specific IPR commitments, because the effect of general IPR provisions most likely is harder to replicate than the one of specific IPR provisions considering that even stringent provisions have to be adapted to the domestic legal context. If countries thus decide to repeat IPR provisions of previous PTAs based on their best-practice character, then these provisions are expected to be stringent IPR provisions. Therefore, where a stringent IPR provision has been included in any previous PTA, other countries can learn from this experience, and if the practice of including said provision has proven reliable, other countries might follow and include the same specific IPR provision in their PTA.

Hypothesis 7.3: If specific IPR provisions have been included in a previous PTA, the more likely these specific provisions are to be repeated in a later PTA.

4.1.8 Summary of Design Hypotheses

Based on the theoretical debate laid out above, I derived 22 hypotheses to explain the development of the design of IPRs in PTAs for the seven explanatory factors of *Economic Power Asymmetry*, *Political Pressure (US-specific)*, *Domestic Interests*, *Veto Players*, *Endogeneity*, *Regime Preference*, and *Path Dependency*. *Table 22* lists all hypotheses for the different theoretical foci and summarises the impact on the corresponding IPR content of PTAs. The relation is always assumed to be either positive, i.e. that when the explanatory factor increase the corresponding IPR design factor increases, or negative, i.e. that when the explanatory factor increase the corresponding IPR design factor decreases.

Table 22: Design Hypotheses Overview

Theoretical Argument	**Hypotheses**		**Relation**
Economic Power Asymmetry	H1.1	The higher the economic power asymmetry between PTA members, the more stringent IPR provisions are included in PTAs.	Positive on stringent IPR
	H1.2	The higher the economic power asymmetry between PTA members and the existence of substantial tariff commitments in the PTA, the more stringent IPR provisions are included in PTAs.	Positive on stringent IPR
	H1.3	The higher the economic power asymmetry and the financial commitments between PTA members, the more stringent IPR provisions are included in PTAs.	Positive on stringent IPR
Political Pressure	H2	H2: If one of the PTA members are listed in the Special 301 report, the more stringent IPR provisions are included in PTAs with the US.	Positive on stringent IPR
Domestic Interests	H3.1	The stronger the domestic IPR exporting interests are among PTA members, the more likely the PTA includes stringent IPR provisions.	Positive on stringent IPR

Theoretical Argument	Hypotheses		Relation
Domestic Interests (cont.)	H3.2	The stronger the domestic IPR interests are among PTA members, the more likely the PTA includes stringent IPR provisions.	Positive on stringent IPR
Veto Players	H4.1	The more veto players there are among the PTA members, the more general IPR provisions are included in the PTA.	Positive on general IPR
	H4.2	The more veto players there are among the PTA members, the fewer stringent IPR provisions are included in the PTA.	Negative on stringent IPR
	H4.3	The fewer veto players there are among the PTA members, the clearer the trend towards a maximum or minimum standard of IPR protection.	Negative on general IPR/ stringent IPR
	H4.4	The more veto players there are among the PTA members, the fewer specific IPR DSM provisions are included in the PTA.	Negative on IPR DSM
	H4.5	The more veto players there are among the PTA members, the fewer IPR enforcement provisions are included in the PTA.	Negative on IPR enforcement
Endogeneity	H5.1	The deeper the overall PTA, the more stringent IPR provisions are included in the PTA.	Positive on stringent IPR
	H5.2	The deeper the market access provisions are in the PTA, the more stringent IPR provisions are included in the PTA.	Positive on stringent IPR
	H5.3	The more IPR enforcement provisions are in the PTA, the more stringent IPR provisions are included in the PTA.	Positive on stringent IPR
	H5.4	The more specific IPR enforcement provisions are in the PTA, the more stringent IPR provisions are included in the PTA.	Positive on stringent IPR
Regime Preference	H6.1	The lower the commitment to IPR multilateral coherence in PTAs, the fewer IPR provisions are included in PTAs.	Positive
	H6.2	The higher the commitment to IPR multilateral coherence in PTAs, the fewer stringent IPR provisions are included in PTAs.	Negative on stringent IPR
	H6.3	The higher the commitment to IPR multilateral coherence in PTAs, the more stringent IPR provisions are included in PTAs.	Positive on stringent IPR
	H6.4	The lower the commitment to IPR multilateral coherence in PTAs, the more stringent IPR provisions are included in PTAs.	Negative on stringent IPR
Path Dependency	H7.1	If the IPR provisions have been included in a previous PTA of at least one PTA member, the more likely these provisions are to be repeated in follow-up PTAs.	Positive
	H7.2	If general IPR provisions have been included in a previous PTA of at least one PTA member, the more likely these general provisions are to be repeated in follow-up PTAs.	Positive on general IPR
	H7.3	If specific IPR provisions have been included in a previous PTA, the more likely these specific provisions are to be repeated in a later PTA.	Positive on stringent IPR

In the following subchapter, I will show how the hypotheses are operationalized and what data is used to test them. In the subsequent subchapter, the hypotheses are analysed and tested for their explanatory power.

4.2 Design: Data

This chapter focuses on the variation in the design of IPRs, and the core of the analysis builds on the IPRs in PTAs dataset (*Chapter 3: Dataset on Intellectual Property Rights in PTAs*). The unit of analysis are the PTAs and the additionally added external data is based on the year of signature of the PTA. This is the time when an agreement was reached on the design of the PTA provisions, and the year of signature most accurately reflects the relationships between and in the member countries at the time of the design finalisation. For the analysis of the design, the year of entry into force would bias the results as there might be substantial time passing between the finalisation of the PTA design and the entry into force.

For the analysis, I dropped those PTAs signed in years before the first PTA included IPRs not further to inflate the number of PTAs including zero IPRs, namely all before 1977 (EC Syria signed in 1977). This means that 92 PTAs were dropped and the analysis of the design of IPRs in PTAs includes 606 PTAs ranging from 1977 to 2018.

As shown in the summary of the hypotheses in *Table 22*, the dependent variables are IPR design features and based on the IPR indexes. The explanatory variables vary depending on the theoretical focus and hypothesis. The PTA external variables are matched to the PTA level according to the country-level data of the PTA members. The subsequent paragraphs describe how the hypotheses are operationalised, what data is used and how the analysis is structure.

4.2.1 Design: Dependent Variables

The dependent variables reflect the design of IPRs in PTAs and are primarily based on the IPR variables and indexes of the IPRs in PTAs dataset (see *Chapter 3: Dataset on Intellectual Property Rights in PTAs*). The detailed coding measures for the variables and the composition of each index can be found in *Appendix 2: Codebook of IPRs in PTAs Dataset* for the IPR variables, and in *Appendix 3: Codebook of T+PTA Dataset* for the TRIPS-plus variables.

Table 23 summarises the dependent concepts matched to the explanatory factors as well as the targeted hypotheses and direction of the proposed relation to IPR design (see

4.1 Design: Theoretical Context and Hypotheses and *Table 22: Design Hypotheses Overview*).

Table 23: Overview of IPR Design Features, Explanatory Factors and Hypotheses

IPR Design Features Dependent Variables	Explanatory Factors Independent Variables	Hypotheses	
		Positive Relation	**Negative Relation**
General IPR	Domestic Interest	(H3.1, H3.2)	
	Veto Players	H4.1	H4.3
	Regime Preference	H6.1	
	Path Dependency	H7.1, H7.2	
Stringent IPR	Economic Power Asymmetry	H1.1, H1.2, H1.3	
	Political Pressure	H2	
	Domestic Interests	H3.1, H3.2	
	Veto Players		H4.2, H4.3
	Endogeneity	H5.1, H5.2, H5.3, H5.4	
	Regime Preference	H6.1, H6.3	H6.2, H6.4
	Path Dependency	H7.1, H7.3	
IPR DSM	Veto Players		H4.4
IPR Enforcement	Veto Players		H4.5

The variables used for the analysis of the design are binary, whereas the indexes are ordinal except the measure for the IPR DSM. The **IPR DSM** is a dummy variable comprising two variables of the category "IPR general enforcement dummy" (see *3.2.3 Dataset Development*) and summarising the IPR specific DSM within the PTA (ipr_comprehensive_dispute_settlement_mechanism_dummy). It is based on the two binary variables coding for a DSM specifically related to IPR (ipr_dispute_settlement_mechanism), and IPR being defined as investment and covered by the DSM of the investment chapter (ipr_investment_dispute_settlement_mechanism). The other ordinal indexes are predominately based on the binary IPR coding and summarise the dichotomous IPR variables. However, the IPR multilateral coherence index is not based on binary coding as it measures the level of bindingness of IPR commitments ranging from zero to five (see *3.1.2.4 IPR Multilateral Coherence Variables*).

The **IPR enforcement** is analysed by looking at the three IPR enforcement indexes. Firstly, the index for general enforcement (ipr_general_enforcement_sum) to allocate if countries can agree on at least general IPR enforcement provisions. Secondly, the index summarising the specific enforcement variables (ipr_specific_enforcement_sum), which allows seeing if countries are willing to include detailed provisions on IPR enforcement. Thirdly, I look at the overall enforcement index (ipr_enforcement_sum) that combines the above two indexes and shows the complete picture of IPR enforcement.

When the hypotheses state a relation to **general IPR**, I use a number of different indexes to capture the effect on the design more precisely. Firstly, I use the summary index of general IPR variables (ipr_general_sum) to measure the overall impact on general IPR variables in PTAs. Secondly, I look at the summary index of general IPR enforcement variables (ipr_general_enforcement_sum) to see if the effect focuses on general IPR enforcement. Thirdly, I take the summary index of IPR forms mentioned in the PTA (ipr_scope_mentioned_sum) as well as the variables for the individual IPR forms (ipr_m_copyrights_related_rights, ipr_m_trademarks, ipr_m_geo_indications, ipr_m_industrial_designs, ipr_m_patents, ipr_m_undisclosed_information, ipr_m_layout_design_integ_circuits, ipr_m_new_plant_varieties, ipr_m_trad_knowledge_genetic_resources, ipr_m_encrypted_program_carrying_satellite_signals, ipr_m_domain_names). This allows to analyse if the explanatory variables have an effect on the general scope of IPRs in PTAs or impact the design of IPR forms such as patents or copyrights. Fourthly, I take into account the effect on multilateral coherence variables and use the summary index on IPR multilateral coherence, which stands for the sum of treaties included regardless of the bindingness of the commitment (ipr_multilateral_coherence_dummy_sum). This allows analysing the general effect of IPR multilateral coherence.

For those hypotheses postulating an effect on the **stringent IPR** provisions, I apply multiple indexes as well. The argument hereby is that there might be an overall effect on stringent IPR variables or an effect with a specific design target. The degree of impact can also vary depending on the design feature. Firstly, I use the summary index of specific IPR variables (ipr_specific_sum) to analyse the broader effect on specific IPR variables, and the TRIPS-plus summary index based on the TRIPS-plus variables of the T+PTA dataset (ipr_tripsplus_per_pta) to focus on the overall effect on TRIPS-plus provisions. Secondly, I look at the effect on tangible IPR provisions using the summary index of tangible IPR commitments (ipr_scope_tangible_sum) and the individual tangible IPR scope variables (ipr_t_copyrights_related_rights, ipr_t_trademarks, ipr_t_geo_indications, ipr_t_industrial_designs, ipr_t_patents, ipr_t_undisclosed_information, ipr_t_layout _design_integ_circuits, ipr_t_new_plant_varieties, ipr_t_trad_knowledge_genetic_resources, ipr_t_encrypted_program_carrying_satellite_signals, ipr_t_domain_names).

Again, this allows insights into general effects on the tangible IPR scope as well as isolating effects for specific tangible IPR forms such as trademarks or geographical indications. Thirdly, I use the summary indexes for the TRIPS-plus categories to identify if there are targeted effects on, for example, TRIPS-plus undisclosed information provisions or IPR exhaustion (ipr_tripsplus_copyrights_related_rights, ipr_tripsplus_trademarks, ipr _tripsplus_geo_indications, ipr_tripsplus_industrial_design, ipr_tripsplus_patents, ipr_ tripsplus_undisclosed_information, ipr_tripsplus_layout_design, ipr_tripsplus_new_ plant_varieties, ipr_tripsplus_trad_knowledge_genetic_resources, ipr_tripsplus_encrypted_program_carrying_satellite_signals, ipr_tripsplus_domain_names, ipr _tripsplus_enforcement, ipr_tripsplus_exhaustion). Fourthly, I apply the summary index on specific IPR enforcement provisions (ipr_specific_enforcement_sum) to identify if the design variations are mainly targeting specific IPR enforcement. Fifthly, I focus on the summary index on IPR multilateral coherence reflecting the bindingness of these commitments (ipr_multilateral_coherence_bindingness_sum).

The usage of different indexes is essential to narrow down the target of IPR regulation. However, they cannot be included in the same model as the indexes have a high correlation and sometimes overlap on the inclusion of coded variables, for example, the specific IPR index includes the specific enforcement index. Moreover, the general, specific and TRIPS-plus indexes are interdependent, as there is no TRIPS-plus PTA without specific IPR provisions, and no specific PTA without general IPR. I will, therefore, run the models for all the dependent variables indicated above to ensure a comprehensive IPR design analysis. Before describing the models for the analysis (*4.2.5 Design: Models of Analysis*), the next subchapters describe the operationalisation of the explanatory and control variables, followed by a subchapter on descriptive statistics for both dependent and independent variables.

4.2.2 Design: Explanatory Variables

The explanatory variables include data from external sources as well as IPR variables of the IPRs in PTAs dataset (see *Chapter 3: Dataset on Intellectual Property Rights in PTAs*). To illustrate the operationalisation of the 23 hypotheses and data sources clearly, the description is segmented according to the seven theoretical foci described further in subchapter *4.1 Design: Theoretical Context and Hypotheses*.

4.2.2.1 Data for Economic Power Asymmetry

The economic power asymmetry has been one of the main explanatory factors for the design of IPRs in PTAs. Economic power itself has already been used to explain other PTA design features such as human rights provisions. For example, Hafner-Burton (2009) argues that economic asymmetry between PTA members can explain human rights provisions in PTAs measured by their absolute difference in GDP.

To operationalise economic power asymmetry and its impact on the design of IPRs in PTAs, I slightly adapt the measure and argue that the main argument when looking at the design of IPRs is that there is one PTA member with substantially more power than the other PTA member(s), which allows for this particularly strong PTA member to design the IPR in PTAs to its liking. Therefore, I look at the share of the GDP of the most powerful PTA member (maximum GDP) and relate it to the overall economic power among PTA members (sum of GDP). The economic power asymmetry is thus measured by the maximum GDP divided by the sum of GDP among PTA members (see Morin and Surbeck 2019). I also apply the same calculation to the GDP per capita (GDPpc) to account for the GDP in relation to the population of the countries. I use the GDP data provided by the World Bank database (World Bank 2018a) ranging from 1960 until 2017 and match it to the year of PTA signature.

Whilst the economic power asymmetry suffices for hypothesis H1.1, I create an interaction term for each of the other two economic power asymmetry hypotheses. I build an interaction term between the economic power asymmetry measured as described above and multiply it by the occurrence of substantial tariff cuts within the PTA for H1.2. The argument states that the economic power asymmetry only becomes relevant for the design of IPRs if the smaller PTA partner also benefits from the PTA, i.e. if there is a trade-off between PTA members. The data for the existence of a substantial commitment on tariffs is taken from the DESTA database, which includes an additive "depth" index "*that combines seven key provisions that can be included in PTAs […]. The first provision captures whether the agreement foresees that all tariffs (with limited exceptions) should be reduced to zero (that is, whether the aim is to create a full free trade area). The other six provisions capture cooperation that goes beyond tariff reductions, in areas such as services trade, investments, standards, public procurement, competition and intellectual property rights. For each of these areas, we code whether the agreement contains any substantive provisions. A substantive provision, for example, is a national treatment* *clause in the services chapter. A statement that the contracting parties desire to open their services markets, by contrast, does not count as a substantive provision"* (Dür, Baccini, and Elsig 2014, 358–59). For the interaction term, I only need the first provision of the additive index, which codes if there is substantial tariff reduction through the PTA. This binary coding of the substantial tariff reduction is multiplied with the economic power asymmetry.

For H1.3, I create two separate interaction terms multiplying the economic power asymmetry measures by the FDI respectively the share of aid payments received by PTA members. The data for both FDI and aid payments is also taken from the World Bank database (World Bank 2018a). The reasoning to include FDI into the economic power argument is that economically powerful countries can convince other PTA members to increase FDI outflows into PTA member countries in turn for more stringent IPR provisions, i.e. more stringent protection for their investment. The impact of economic power thus increases with the FDI outflow magnitude of PTA members. I will therefore multiple the measure for economic power asymmetry by the sum of FDI outflows amongst PTA members.

The reasoning regarding aid contributions is that if PTA members are financially dependent on aid payments by economically powerful PTA members, they might be accepting donor's interests more willingly in turn for continued aid payments. Thus the impact of economic power asymmetry can be intensified by the amount of aid received, i.e. an interaction term multiplying the GDP asymmetry by the sum of official development assistance and official aid received among PTA members. Moreover, the World Bank database (World Bank 2018a) provides data on the bilateral aid flows received by 29 donors from the OECD Development Assistance Committee (DAC) as well as the total aid received by the DAC donors. I will, therefore, include an additional explanatory interaction term that accounts for the DAC aid received by PTA members in relation to the total aid received by DAC donors to account for the importance of PTA members' aid donations and their financial power over other PTA members.

4.2.2.2 Data for Political Pressure

The data to measure the political pressure is based on the "Special 301 Reports" available on the United States Trade Representatives (USTR) website (Office of the United States Trade Representative 2018b). I transformed the reports into a binary coding on the country-level for each reported year to reflect which countries were covered by the report in which year. This was mapped to the PTA-level dataset according to the sum of PTA members on the "Special 301 Reports" per PTA. The data ranges from 1989 to 2018, resulting in a loss of the 155 PTAs signed before 1989. The data on political pressure is thus available for a total of 543 PTAs.

4.2.2.3 Data for Domestic Interests

There are multiple ways to operationalise domestic interests, and depending on the IPR form focused on, some are more fitting than others. For example for patents, the investment in R&D is expected to be especially important whereas it is far less relevant for geographical indications. Whilst R&D expenditure thus is a good indicator for some IPR interests it will not capture others. In the following section, I will elaborate on the measures tested for my analysis, which are not exhaustive, yet represent a broad measure across different IPR forms and are the ones with material data available for most countries. Namely, I operationalise domestic interests by the charges received for the use of intellectual property such as license payments, the number of IPR applications available for patents, trademarks, industrial design, two R&D measures, and IPR trade volumes according to a sectoral division of traded goods. The first three factors are used for the hypotheses H3.2, whereas the IPR trade values are applied for H3.1 postulating an impact of domestic IPR exporting interests.

Firstly, the domestic interests can be characterised by charges received for the use of IP. These charges can be received for the authorised use of intellectual property such as copyrights, trademarks, undisclosed information, patents and industrial designs, and licensing fees for goods protected by copyrights and related rights such as television and satellite broadcast (World Bank 2018a). The more recipients of such IPR charges are within a country, the better those IPRs are already represented domestically and the more likely it is that these domestic interests were able to influence domestic politics to represent their interest also in international negotiations. Thus, I expect that countries receiving more payments for IPR usage will opt for a more stringent IPR standard in PTAs in order to protect and improve their IPR interests. The data for IPR charges is downloadable from the World Bank database (World Bank 2018a) and available on a country level. I use the sum of all PTA partners received charges for IP usage as the first measure for domestic IPR interests.

Secondly, I look at the number of IPR applications for patents, trademarks, and industrial designs, as for these IPR forms there exists data in a comprehensive and comparable manner for the majority of countries. So far, there are no comparable datasets available for the other forms of IPRs across countries. I will look at the impact of domestic IPR applications from two perspectives. On the one hand, I look at the applications filed by residents to reflect the domestic interests for the respective IPR areas and use this as a proxy representing domestic IPR interests in general. On the other hand, I will look at the share of applications filed by residents from PTA members in comparison to the total applications filed to reflect the interest of the PTA members relative to their impact in the foreign PTA member market. The data is provided by the WIPO Intellectual Property Statistics Data Center (World Intellectual Property Organization 2018a) and is available on a dyadic country-level basis, i.e. the data included how many applications are received by which countries residents. Thereby, I use the number of applications summed per PTA members and year, as well as their cumulative value over time, as the domestic interests might be reflected more accurately considering the development over time.

Thirdly, domestic interests are measured by two R&D factors. On the one hand, I look at the number of researchers working in the area of research and development. This shows how many employees are involved in the production of intellectual property and have an interest in protecting their work and its results domestically and abroad. According to the World Bank database (World Bank 2018a), their measure of researchers includes "*professionals who conduct research and improve or develop concepts, theories, models techniques instrumentation, software of operational methods. R&D covers basic research, applied research, and experimental development.*" The data is provided annually per country, which is matched to the PTA members per year of signature. On the other hand, I use the R&D expenditure of countries to represent the domestic interests in IPR protection. Countries with high investments in research and development (R&D) or a large number of personnel working in R&D are more likely to be those with a substantial IPR production sector (United Nations Conference on Trade and Development (UNCTAD) 2010, 11). These countries will aim to protect their interest abroad either by harmonising or implementing IPR regulation to match the stringent IPR regulation in their home market. The R&D expenditures cover the business, government, higher education and private non-profit sectors and are provided by the World Bank database (World Bank 2018a). I use the maximum percentage reached among PTA members as well as their average R&D expenditures. This allows determining if the driving force for stringent IPR protection is rather one country with the most dominant interests to protect, or can be found in the PTAs, where countries share the same interests.

Fourthly, the domestic IPR interests can be operationalised by looking at the trade volumes. Within IPR literature, these the trend is to specifically look at goods that have a high-technology intensiveness. For example, patent-protected goods are assumed to be predominantly highly technological such as clockworks or pharmaceuticals. However, there can be also the argument made that IPRs affect more than high-technology products as IPRs themselves are not uniform. For example, the protection of trademarks can affect not only high-technology goods but also low-technology or medium-technology goods such as clothes or food products. Most likely, the categorisation of IPRs is not generalisable to one main sector of traded goods and rather varies according to the form of IPR protected (see *Table 1: Forms of IPR*).

Table 24 is based on a report by the UN, which maps IPRs to those sectors most affected by IPR protection (United Nations Conference on Trade and Development 2010, fig. 1). For those categories not in the UN report, I added the sectors, which are anticipated to be impacted by IPR protection.

Table 24: IPR Forms and Impacted Sectors

IPR Form	Impacted Sectors
Copyrights	Printing Entertainment Software Broadcasting
Trademarks	Across all sectors
Geographical Indications	Food products Handicrafts
Industrial Designs	Clothing Automobiles Electronics, etc.
Patents	Chemical and pharmaceutical industry Mechanical industry Electronic sector Industrial control Scientific equipment
Undisclosed Information	Across all sectors
Layout-Designs of Integrated Circuits	Microelectronics
New Plant Varieties	Agriculture Food products
Traditional Knowledge & Genetic Resources	Chemical and pharmaceutical industry Agriculture Food products

IPR Form	Impacted Sectors
Traditional Knowledge & Genetic Resources (cont.)	Handicrafts Services
Encrypted Program-carrying Satellite Signals	Entertainment Software Broadcasting
Domain Names	Entertainment Software Broadcasting Services

Table 24 shows that goods at all kinds of levels of technology-intensiveness are expected to be affected by IPRs (see United Nations Conference on Trade and Development (UNCTAD) 2010, 11). Therefore, I expand the sector analysis beyond the scope of high-technology goods and include trade flows more broadly. Concretely, I use the classification of goods into high-technology to low-technology products of the JRC European Commission Report by Loschky (2010).

Table 25 repeats the categories by Loschky (2010, 10 Table 1: Classification of Industries Based on Technology Intensity) and the corresponding International Standard Industrial Classification (ISIC) Revision 3 categories of their economic activities.

Table 25: Nomenclature for Technology Intensiveness of Goods

Categories of Technology Intensiveness	Nomenclature ISIC Revision 3
High-technology products (*htp*)	2423 Manufacture of pharmaceuticals, medicinal chemicals and botanical products 30 Manufacture of office, accounting and computing machinery 32 Manufacture of radio, television and communication equipment and apparatus 33 Manufacture of medical, precision and optical instruments, watches and clocks 353 Manufacture of aircraft and spacecraft
Medium-high-technology products (*mhtp*)	29 Manufacture of machinery and equipment n.e.c. 31 Manufacture of electrical machinery and apparatus n.e.c. 34 Manufacture of motor vehicles, trailers and semi-trailers 352 Manufacture of railway and tramway locomotives and rolling stock 359 Manufacture of transport equipment n.e.c.

Categories of Technology Intensiveness	Nomenclature ISIC Revision 3
Medium-low-technology products (*mltp*)	21 Manufacture of paper and paper products 22 Publishing, printing and reproduction of recorded media 241 Manufacture of basic chemicals 2421 Manufacture of pesticides and other agro-chemical products 2422 Manufacture of paints, varnishes and similar coatings, printing ink and mastics 2424 Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations 2429 Manufacture of other chemical products n.e.c. 243 Manufacture of human-made fibres 25 Manufacture of rubber and plastics products 26 Manufacture of other non-metallic mineral products 272 Manufacture of basic precious and non-ferrous metals 28 Manufacture of fabricated metal products, except machinery and equipment 351 Building and repairing of ships and boats 36 Manufacture of furniture; manufacturing n.e.c. 37 Recycling
Low-technology products (*ltp*)	15 Manufacture of food products and beverages 16 Manufacture of tobacco products 17 Manufacture of textiles 18 Manufacture of wearing apparel; dressing and dyeing of fur 19 Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear 20 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials 23 Manufacture of coke, refined petroleum products and nuclear fuel 271 Manufacture of basic iron and steel

The data is downloaded from the World Bank's World Integrated Trade Solutions (WITS) database (World Bank 2018b), which provides the import data for each category defined in *Table 25*. The import data is differentiated according to the country of origin, which allows mapping sector specific imports according to the respective PTA members. I match the sum of these exports by PTA members at the date of the PTA signature to reflect the value according to the goods category of technology intensiveness ranging from high-technology products (*htp*), medium-high-technology products (*mhtp*), medium-low-technology products (*mltp*), to low-technology products (*ltp*). Moreover, these effects could be dependent on the share these exports by PTA members hold on the overall imports in the respective categories. Thus, I also include a measure reflecting the share of PTA members in the total imported *htp*, *mhtp*, *mltp* and *ltp* sectors. The effects are expected to vary across these classifications and IPR forms. However, high-technology products could also prove to be the main explanatory factor for IPR protection.

4.2.2.4 Data for Veto Players

The data for veto players is taken from the POLCON project developed by Henisz (2000), which measures the political constraints in more than 200 countries. I use the "POLCONV" index that includes two factors for 157 countries: firstly, the independent (institutional) veto players influencing the policy outcome, and secondly, how the preferences of these veto players are distributed (Henisz 2000). The "POLCONV" index thus represents how much influence domestic veto players have over policy outcomes such as trade agreements. The index ranges from '0' to '0.894', whereby '0' on the index represents the absence of checks for the executive power and the higher the value on the index get the more substantial veto power over executive decisions on policy changes are held by veto players.

The assumption of more veto players in hypothesis H4.1, H4.2, H4.4, H4.5 thus correlates with a higher score on the "POLCONV" index, whereas the hypothesis H4.3 postulates fewer veto players and correlates with a lower score on the "POLCONV" index. The covered years of "POLCONV" generally range from 1960 to 2017. To match the range of years of the PTAs coded for their IPR content, the data for 2018 was extrapolated based on the values of "POLCONV" for 2017, assuming that number of veto players has remained constant over the last year.

Furthermore, the data for the veto players was transformed from its country-level status to match the PTA-level analysis by adding the score of "POLCONV" across PTA members. This means that the veto players value for the analysis of the design consists of the sum of all veto players among PTA members at the time of the PTA signature.

4.2.2.5 Data for Endogeneity

The data for the endogeneity covers two different aspects: firstly, the endogeneity of the PTA besides IPR measures, and secondly, the endogeneity of IPR enforcement measures.

The first aspect covering the PTA besides the IPR content is taken from the DESTA dataset's additive "depth" index (see *4.2.2.1 Data for Economic Power Asymmetry*). I employ the depth index in two manners: for hypothesis H5.1, I use the additive "depth" index and remove the previously included IPR factor. This gives the overall stringency of the PTA besides IPR measures and can highlight if stringent IPR provisions might only result in combination with an otherwise stringent PTA. For hypothesis H5.2, I only devote the part of the additive “depth” index accounting for substantial tariff cuts. The data covers almost all PTAs except for 51 PTAs that are mostly newer additions to DESTA or multilateral PTAs such as Pan-Arab Free Trade Area (PAFTA).

The second aspect of IPR enforcement is taken from the IPRs in PTAs dataset and is endogenous to the IPR data. For the analysis of both the IPR enforcement measures, the dependent variables were altered accordingly to avoid double inclusion by a deduction of the particular enforcement measures from the dependent indexes. For example, for H5.4 that analyses the effect of specific IPR enforcement on stringent IPR measures, the dependent variable represented by the “index IPR specific” normally includes the entire specific enforcement index. The dependent variables were therefore altered and the specific IPR enforcement index deducted from the original dependent index. As the enforcement measures are part of the IPRs in PTAs dataset, there were no “NA” for these factors.

4.2.2.6 Data for Regime Preference

For the analysis of the underlying motivation of regime preference, I use the IPR multilateral coherence variables of my IPRs in PTAs dataset. Thereby, I apply the summary index over the IPR multilateral coherence variables that also accounts for the bindingness of the commitments (see *Table 14: Description of Indexes*). The higher the value on this index, the more IPR multilateral coherence variables are included in the PTA and the more binding are these commitments (see *3.1.2.4 IPR Multilateral Coherence Variables*). The index ranges from ‘0’ to ‘112’, with a maximum of 24 included IPR multilateral coherence references per single PTA. On average, countries score around 15 on this index over all PTAs, and amongst those PTAs including IPR multilateral coherence references, the average score lies at 35 for this index. There are no missing values for this index as it is integral part of the IPRs in PTAs dataset.

4.2.2.7 Data for Path Dependency

Similar to the data for second factors of the endogeneity measure, the data for path dependency is also derived from the IPRs in PTAs dataset. I apply two different measures to account for the effect of path dependency: the first one is based on an “intra-country path dependency”, whilst the other focuses on the “international path dependency”. The “intra-country path dependency” measure reflects what countries could learn from their previous signed PTA templates and which variables have been included in one of their previous PTAs. To measure this factor, I coded if the same provision has been included in any previous PTA by the same country. This means that for the first PTA per country, there is always a zero account for this measure as there has not been any own predating PTA that the country could have learned from.

The assumption for the "international path dependency" measure is that countries learn from one another and, for example, would learn from best-practices of other countries. To calculate this measure, I compared if each variable included in a PTA has been previously included in predating PTA across the entire dataset.

To measure the path dependency, I added summary indexes matching those for the coded variables on general and specific IPR, general and specific enforcement, mentioned and tangible IPR scope, binding and binary IPR multilateral coherence, and TRIPS-plus path dependency. For the TRIPS-plus index, I created a new index summarising the binary measure of a country's path dependency from TRIPS-plus commitments on one of the eleven scope categories, enforcement or exhaustion. Besides the indexes, I also look at the path dependency for the binary scope variables, both mentioned and tangible, as well as the binary learning from TRIPS-plus protection for the IPR scope, enforcement and exhaustion categories. Instead of summarising the coded variables, they summarise those instances, where countries have either learned from their previous experiences (labelled as 'pd' for path dependency) or from another country's PTA (labelled as 'pdw' for path dependency worldwide). For the global learning, there are two measures: one measuring the impact after a PTA has been signed ('pdw s') and the other after it has entered into force ('pdw f'). It is anticipated that both can influence the path dependency of countries.

4.2.3 Control Variables

Additionally to the baseline model, I include a number of control variables that have proven to be explanatory for the analysis of PTAs and could also impact the design of IPRs. These are the domestic political context, specific countries being part of the PTAs, the absolute economic power of PTA partners, and the geographic distance between PTA members. The subsequent paragraphs describe how and why these control variables are included.

First of all, the domestic political context can influence trade agreements. Besides the veto players argument, political research on trade agreements has successfully shown that the political structure defined by the level of democracy among PTA members influences the likelihood of countries entering PTAs together (E. D. Mansfield and Milner 2012).

Thereby, it seems more likely that democracies enter into a trade agreement with each other than autocracies amongst each other or with democracies. As trade agreements are seen as a way to improve the trading conditions between partners and increase the welfare of the PTA members, their intention should be positively acknowledged by voters in democratic systems and rewarded with political support, whereas autocratic regimes have less accountability and (political) incentive to enter into PTAs (see Baccini 2019). This effect of voter accountability could also extend beyond the mere entrance into PTAs and affect specific topics such as the regulation of IPRs through PTAs. Therefore, I include the average score of PTA members on the "Polity 2" index by the Polity IV Project, which includes data on the characteristics and transitions of political regimes ranging from 1800 to 2017 (Marshall, Jaggers, and Gurr 2018). A higher score on the index stands for a more democratic regime, which is more likely to be held accountable for its actions. In line with the previous research, I will assume that there is a positive correlation between at least general IPR provisions in PTAs. For stringent IPR provisions, the effect could be ambiguous as too stringent IPR protection might not be deemed beneficial by all voters in democratic societies. To match the data of the IPRs in PTAs dataset, the data for 2018 was extrapolated based on the values of 2017 to avoid the loss of the most current agreements signed in 2018.

Secondly, I check certain countries are influencing the design of IPRs in PTAs. For example, there have been contributions claiming that countries use a specific PTA template as "*negotiators do not 'reinvent the wheel' when they bargain over the provisions included in PTAs. Rather, they choose from a limited menu of principal models, specifically a Southern model, an EU model and a NAFTA model*"(Baccini, Dür, and Haftel 2015, 190). For IPRs in PTAs, the data shows that even the IPR leaders do not consistently stick to their template (see *3.3.7 Descriptive Statistics Grouped by Selected Countries*). Moreover, the case of TPP and its predecessor CPTPP show that the IPR design features vary according to the PTA members. Previous research without a comprehensive dataset on IPRs in PTAs has often argued that there are certain countries such as the US designing the provisions on IPRs to PTAs or that the north-south differentiation explains the design variations. To check the impact of countries on the IPR design, I will use the alternative classification of countries with a possible interest in protecting IPR and representing a more fitting differentiation than the north-south divide (see *Table 17: IPR Country Selection Criteria*).

Table 26: Country Blocks as Design Control Variables

Blocks	Classification	Countries
1	Classic IP leaders	US, EU, EFTA, Japan
2	Countries with a high increase of patent protection	Brazil, China, India, Mexico
3	New IP producers and developers	Israel, South Korea, Singapore, Taiwan

Each block of countries shown in *Table 26* will be used as a control variable, highlighting if the PTA membership of the selected countries distinctively alters IPR design. All blocks are expected to positively correlate with more stringent IPR protection, whereby for block 2 this effect could be accentuated for patent protection.

Thirdly, I include the economic capacity of PTA members in a more general manner than with the economic power asymmetry (see *4.1.1 Economic Power Asymmetry*). As the countries' economic capacity could also indicate how much they can invest on IPR and IPR protection and, thus, their willingness to include more stringent IPR protection, I add as control variable the logarithmised average of GDP (ln GDP) and GDP per capita (lnGDPpc) amongst PTA members. The GDP and GDPpc data is taken from the World Bank database (World Bank 2018a).

Fourthly, I use a proven indicator for the formation of trade agreements: geographic distance between PTA members. The argument is that due to the closer geographic distance between PTA members, their transportation costs are lower and they are more likely to benefit from a PTA (Baier and Bergstrand 2004). For IPRs in PTAs, this would mean that lower geographic distance would increase the inclusion of stringent IPR provisions in order to harmonise the IPR regulation with the closest trading partners. This way, the low transportation costs are matched by low adaption costs to foreign IPR standards and might even guarantee similar IPR enforcement mechanisms. Moreover, PTA members with a low geographical distance to each other are expected to be more aware of the situation on non-trade areas in neighbouring or at least close countries (see Lechner 2016) and might even share similar attitudes towards political issues such as IPR ideals (see *Figure 7: Diverging Ideals of IPR Standards*). I include the average geographic distance between PTA members for those countries with more than two members. The data for the geographic distance is provided by the Centre d'Études Prospectives et d'Informations Internationales (CEPII) dataset on geographic distance (Mayer and Zignago 2011).

4.2.4 Design: Descriptive Statistics

Before discussing the models used for the analysis, I illustrate the descriptive statistics for the variables of the analysis in *Table 27*. The table begins with the dependent variables according to their category stated in the hypotheses and continues by listing the explanatory categories and their operationalisation. The metric values such as GDP and FDI are transformed to logarithmic values (ln) to make them comparable to the other measures in the model.

Table 27: Descriptive Statistics for the Design Data

Variables	NAs	Min	Max	Median	Mean	Std.Dev.
Dependent Variables						
General IPR						
Index IPR general (sum)	0	0	24	5.00	7.04	7.11
Index IPR scope mentioned (sum)	0	0	11	0	3.03	3.57
Binary variables for IPR scope mentioned	see *Appendix 2: Codebook of IPRs in PTAs Dataset*					
Index IPR general enforcement (sum)	0	0	6	0	1.09	1.46
Index IPR multilateral coherence dummy (sum)	0	0	24	1.00	4.10	6.05
Stringent IPR						
Index IPR specific (sum)	0	0	15	0	1.79	3.67
Index IPR scope tangible (sum)	0	0	9	0	0.93	1.98
Binary variables for IPR scope tangible	see *Appendix 2: Codebook of IPRs in PTAs Dataset*					
Index IPR specific enforcement (sum)	0	0	7	0	0.86	1.81
Index IPR multilateral coherence (sum)	0	0	112	1	17.63	26.89
Index TRIPS-plus (sum)	0	0	42	0	3.07	7.89
Additive variables for TRIPS-plus categories	see *Appendix 3: Codebook of T+PTA Dataset*					
IPR DSM						
Index IPR DSM (dummy)	0	0	1	0	0.16	0.37
IPR Enforcement						
Index IPR general enforcement (sum)	0	0	6	0	1.09	1.46
Index IPR specific enforcement (sum)	0	0	7	0	0.86	1.81
Index IPR enforcement (sum)	0	0	13	0	1.95	3.07
Independent Variables						
Economic Power Asymmetry						
GDP asymmetry (max/sum)	35	0.14	1.00	0.74	0.69	0.26
GDPpc asymmetry (max/sum)	35	0.08	0.99	0.59	0.55	0.25
GDP asymmetry * substantial tariff cuts	81	0	1.00	0.57	0.49	0.37
GDPpc asymmetry * substantial tariff cuts	81	0	0.98	0.41	0.41	0.33
GDP asymmetry * ln FDI	67	0.25	26.95	14.37	14.13	6.19
GDPpc asymmetry * ln FDI	67	0.24	25.76	10.86	11.21	5.92
GDP asymmetry * lnofficial development assistance and official aid received	48	0.19	21.91	14.42	12.92	6.01

Variables	NAs	Min	Max	Median	Mean	Std.Dev.
GDPpc asymmetry * lnofficial development assistance and official aid received	48	0.11	21.31	11.24	10.49	5.60
GDP asymmetry * (DAC aid received by PTA members/ DAC aid received)	121	-1.9	0.78	0	0.02	0.12
GDPpc asymmetry * (DAC aid received by PTA members/ DAC aid received)	121	-1.1	0.75	0	0.01	0.08
Political Pressure						
PTA members on Special 301 Reports (sum)	0	0	27.00	1.00	2.03	3.89
Domestic Interests						
ln Charges for the use of IP, receipts (sum)	0	0	25.9	17.72	16.28	7.51
ln Resident applications for patents (sum)	0	0	14.08	7.80	7.83	3.37
ln Resident applications for trademarks (sum)	0	0	14.43	10.17	9.71	2.91
ln Resident applications for industrial design (sum)	0	0	13.40	7.28	6.86	3.20
ln Resident applications for patents (cumulative, sum)	0	0	17.01	10.21	10.25	3.62
ln Resident applications for trademarks (cumulative, sum)	0	0	16.85	12.40	11.93	3.20
ln Resident applications for industrial design (cumulative, sum)	0	0	15.67	9.52	9.21	3.52
Applications for patents by PTA members / total applications for patents	0	0	3.77	0	0.19	0.56
Applications for patents by PTA members / total applications for patents	0	0	9.19	0	0.52	1.44
Applications for patents by PTA members / total applications for patents	0	0	6.77	0	0.34	1.01
Applications for patents by PTA members / total applications for patents (cumulative)	0	0	0.02	0	0	0
Applications for patents by PTA members / total applications for patents (cumulative)	0	0	0.32	0	0.03	0.06
Applications for patents by PTA members / total applications for patents (cumulative)	0	0	0.51	0	0.02	0.06
Number of researchers in R&D (sum)	0	0	11.50	4.77	4.13	4.09
R&D expenditure (sum)	0	-4.5	3.82	0	0.29	1.12
Imports of htp by PTA members (sum)	0	-1.6	17.14	7.29	6.23	5.39
Imports of mhtp by PTA members (sum)	0	0	18.54	8.08	6.89	5.91
Imports of mltp by PTA members (sum)	0	-1.6	16.64	6.95	6.12	5.41
Imports of ltp by PTA members (sum)	0	-1.8	15.92	4.17	5.31	5.40
Imports of htp by PTA members / total htp imports	0	0	0.42	0	0.01	0.03
Imports of mhtp by PTA members / total mhtp imports	0	0	0.47	0	0.01	0.04
Imports of mltp by PTA members / total mltp imports	0	0	0.17	0	0	0.01
Imports of ltp by PTA members / total ltp imports	0	0	0.14	0	0	0.01
Veto Players						
Veto players (sum)	0	0	26.29	1.36	2.98	4.78

Variables	NAs	Min	Max	Median	Mean	Std.Dev.
Endogeneity						
PTA depth	50	0	6.00	2.00	2.45	1.83
Substantial tariff cuts (dummy)	50	0	1.00	1.00	0.74	0.44
Index IPR enforcement (sum)	0	0	13	0	1.95	3.07
Index IPR specific enforcement (sum)	0	0	7	0	0.86	1.81
Regime Preference						
Index IPR multilateral coherence (sum)	0	0	112	1	17.63	26.89
Path Dependency						
Index IPR general pd (sum)	0	0	796	30.00	68.00	124.43
Indexes based on binary IPR scope mentioned pl	See *Appendix 18*					
Index IPR general enforcement pd (sum)	0	0	179	4.00	12.27	25.13
Index IPR multilateral coherence pl (dummy sum)	0	0	839	20.00	57.14	133.93
Indexes based on binary IPR scope tangible pl	See *Appendix 18*					
Indexes based on binary IPR scope tangible pdw s	See *Appendix 18*					
Indexes based on binary IPR scope tangible pdw f	See *Appendix 18*					
Index IPR specific enforcement pd (sum)	0	0	231	4.00	15.33	34.17
Index IPR specific enforcement pdw s (sum)	0	0	7	0	0.86	1.81
Index IPR specific enforcement pdw f (sum)	54	0	7	0	0.90	1.84
Index IPR multilateral coherence pd (sum)	0	0	839	20.00	57.14	133.93
Index IPR multilateral coherence pdw s (sum)	0	0	24	1.00	4.10	6.05
Index IPR multilateral coherence pdw f (sum)	54	0	24	1.00	4.29	6.09
Indexes based on binary TRIPS-plus categories pd	See *Appendix 18*					
Indexes based on binary TRIPS-plus categories pdw s	See *Appendix 18*					
Indexes based on binary TRIPS-plus categories pdw f	See *Appendix 18*					
Control Variables						
Democratisation (Polity 2) (mean)	5	-10	10.00	7.50	5.15	4.89
Classic IP leaders	0	0	2	0	0.24	0.43
Countries with a high increase of patent protection	0	0	3	0	0.15	0.39
New IP producers and developers	0	0	2	0	0.12	0.35
ln GDP (mean)	5	18.5	29.8	25.57	25.44	1.84
ln GDPpc (mean)	5	5.53	11.36	8.61	8.74	1.29
ln Geographic distance (mean)	24	4.11	9.84	7.50	7.56	0.99

The descriptive statistics of the binary scope variables are already listed in the codebook (see *Appendix 2: Codebook of IPRs in PTAs Dataset* for the mentioned and tangible scope variables, *Appendix 3: Codebook of T+PTA Dataset* for the TRIPS-plus scope, enforcement and exhaustion variables, and *Appendix 18: Descriptive Statistics of the Indexes Based on Binary and Additive Variables (*Design Data) for the path dependency scope and TRIPS-plus variables).

Table 27 shows that the dependent variables are not normally distributed. This is due to a common problem of count data: an excess of zeros. The probability of the coded variables to be coded positively, i.e. to be included in a PTA or not, more often than normal are zero. The combination of the binarily coded variables in the indexes can no fully remedy this issue. *Table 28* lists the occurrences of zero and count values for the dependent variables besides the binary scope and TRIPS-plus variables. *Table 28* illustrates that for all indexes besides the index measuring the general IPR content of PTAs, there is are slightly or even substantially more zero occurrences than positively coded values.

Table 28: Zero Occurrences Among Dependent Variables

Variables	**N = 606**	
Dependent Variables	**0**	**> 0**
General IPR		
Index IPR general (sum)	228	378
Index IPR scope mentioned (sum)	315	291
Index IPR general enforcement (sum)	312	294
Index IPR multilateral coherence dummy (sum)	300	306
Stringent IPR		
Index IPR specific (sum)	447	159
Index IPR scope tangible (sum)	460	146
Index IPR specific enforcement (sum)	469	137
Index IPR multilateral coherence (sum)	300	306
Index TRIPS-plus (sum)	470	136
IPR DSM		
Index IPR DSM (dummy)	509	97
IPR Enforcement		
Index IPR general enforcement (sum)	312	294
Index IPR specific enforcement (sum)	469	137
Index IPR enforcement (sum)	308	298

This excess of zeros in the dependent variables affects the model choice for the analysis of the design of IPRs in PTAs described further in the next subchapter.

4.2.5 Design: Models of Analysis

So far, most research working with substantial PTA design data has focused on the effects the PTA design and its variations unfolds. Often used for the effect of PTA design is the gravity model, which will be further discussed in subchapter *5.2.3 Economic Effects: Analysis*. However, there has been comparatively little research that aims to explain the variations in the design of PTAs such as Lechner (2016) or Raesch et al. (2018) (for an overview of previous research on PTAs see Baccini 2019). I will fill the gap for the design of IPRs in PTAs and test the explanatory power of economic power asymmetry, political pressure, domestic interests, veto players, endogeneity effects, regime preference and path dependency on the variations in IPR regulation through PTAs.

The focus of the design analysis lies on the IPR indexes which are either binary variables (DSM and scope variables) or ordinal variables formed out of the binary IPR variables (see *3.2.3 Dataset Development*). As illustrated in *Table 28*, the dependent variables show an inflation of the category ‘0’, i.e. PTAs do not include these variables and are coded as zero. According to Zeileis et al. (2008, 1) this is a common phenomenon for coded variables and there are two central two-stage approaches that efficiently deal with the zero-inflation of the count variables: hurdle models and zero-inflated models.

Both models have two stages to deal with the excess of zeros in the dependent variables. The hurdle model follows the underlying assumptions that on stage one, the cases are either zero or greater than zero, and on stage two, the values are always greater than zero (Zeileis, Kleiber, and Jackman 2008). According to Mullahy (1986, 345), “*the idea underlying the hurdle formulations is that a binomial probability model governs the binary outcome of whether a count variate has a zero or a positive realization. If the realization is positive, the ‘hurdle’ is crossed, and the conditional distribution of the positives is governed by a truncated-at-zero count data model*.” Zero-inflated models (ZI), on the other hand, assume that there can be zeros on the first as well as on the second stage of the model (Rose et al. 2006). Thereby, zero-inflated models assume that the data structure and not probability causes some cases to be zero on the first stage (Hu, Pavlicova, and Nunes 2011). For example, if countries are not part of a PTA, they can also not opt for IPRs in PTAs. This in turn would lead to a zero for the first stage measure regardless of their preference of IPRs in PTAs. As my dataset on IPRs in PTAs only includes those cases where countries have entered a PTA and by including only those cases beginning in the year of the first appearance of IPRs in PTAs, every PTA potentially could include IPRs.

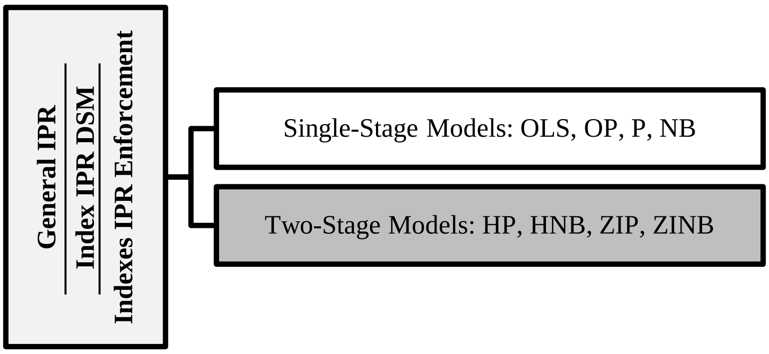
Theoretically, both model fit for the analysis of my indexes depending on which index is analysed. For the index IPR general, the data should not have any structural drivers leading to a zero account on both stages of the two stage model. Instead, the hurdle model allows to distinguish between *“first a choice of whether to form an alliance, and conditional on that choice, a choice of design features”* (see Chiba, Johnson, and Leeds 2015, 976). Applied to the index IPR general this means that the model on the first stage compares those PTAs that include no IPRs to those that do include IPR. After the model has passed this first hurdle, the second stage looks at the variation among those PTAs that do included general IPRs. The first stage of the model thus looks at all PTAs of the dataset (‘0’ or ‘>0’), and describes why countries do or do not choose to include IPRs in PTAs. The second stage is only applied once the first stage of the hurdle model is crossed, and analyses the subset of PTAs positively scoring on the index IPR general (‘>0’). The focus of the second stage lies not on the zero occurrences, but on the count data and explains why countries choosing to include IPRs in PTAs vary in their level of IPR regulation.

However, for the other indexes the argument can be made that there actually can be two drivers of the zero occurrences. If a country has no general IPR included in a PTA then there is per definition of the coded variables also no specific IPR in the PTA. The driver of a zero occurrence of specific variables can thus be firstly, that there is no IPR in the PTA, and secondly, that the PTA includes IPR yet no specific IPR provisions. Applied to a two stage model, the first stage remains the same as in the hurdle model and reflects the decision to include or exclude IPRs in the PTA (‘0’ or ‘>0’). However, on the second stage of, for instance, the specific index, the decision can be either to rest on general IPR regulation equalling a zero score on the specific index, or regulating beyond the general level and score higher than zero on the specific IPR index (‘0’ or ‘>0’). This argument also fits the binary dependent variables better. Here, the first stage can be represented by the general inclusion of IPR in the PTA as a precondition to scoring on, for example, the binary IPR scope variables such as the mentioning of copyright. The assumption of zero occurrence on both stages of the model can be fitted by an zero-inflated model instead of a hurdle model.

To test these theoretical arguments on the model fit and ensure the best fit for the data, I check the robustness by running both hurdle as well as ZI models with Poisson and negative binomial distribution for all dependent variables (HP, HNB, ZIP, ZINB). Moreover, I also apply single-stage model specifications to the data to ascertain that a two-stage model indeed is to be preferred over a single-stage model. Therefore, I run several forms of regressions, namely ordinary least squares (OLS), ordered probit (OP), Poisson (P) and negative binomial (NB) regression. The regression formula are built based on the hypotheses for the design variables listed in *Table 22* respectively *Table 23*. The model further varies depending on the explanatory variables. For the 15 variables of general IPR, the index on IPR dispute settlement mechanism (DSM) and the three indexes for

IPR enforcement the approach was the same, unlike for the variables of stringent IPR. *Figure 10* shows the approach for general IPR, IPR DSM and IPR enforcement, whilst *Figure 11* and *Figure 12* illustrate it for stringent IPR. For the categories of dependent variables (DVs) shown in *Figure 10,* all of the explanatory variables assumed to have an impact on the respective dependent variables were included in the regression formula and run for each model specification, i.e. for the four single-stage models OLS, OP, P and NB as well as the four two-stage models HP, HNB, ZIP, ZINB.

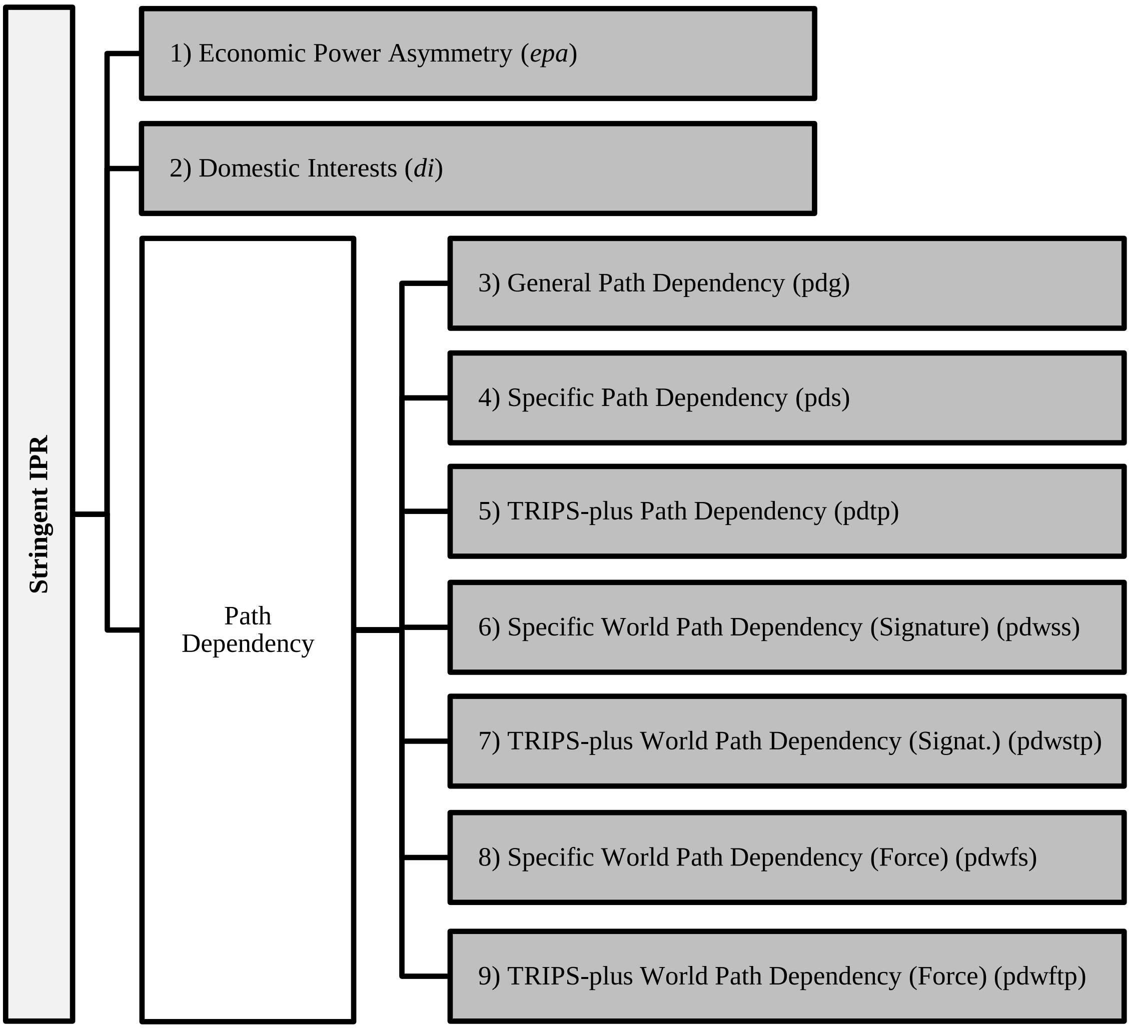
Figure 10: Design Model Specifications I



The model specifications had to be adapted for the stringent IPR DVs due to the included explanatory variables. *Figure 11* shows the first of two additional alterations.

Firstly, the sheer number of explanatory variables required for the analysis of the stringent IPR DVs meant that not all of them could be included in one formula per DV. However, creating models per theoretical categories would have been too restrictive, so as illustrated in *Figure 11* shows, I created blocks for those categories that included the most operationalised variables: economic power asymmetry, domestic interests and path dependency. I created separated models for all different measures of path dependency, due to the obviously high correlation of the path dependency variables. For example, the path dependency from others (pdw) is differentiated according to the date of PTA signature (pdw s) and entry into force of the PTA (pdw f). It can be assumed that the variations between *pdw s* and *pdw f* are highly correlated with the date of the PTA and not per se its content. Thus, the 29 dependent variables representing stringent IPR were analysed separately for economic power asymmetry, domestic interest as well as the seven path dependency categories leading to the nine explanatory variable categories labelled in *Figure 11*.

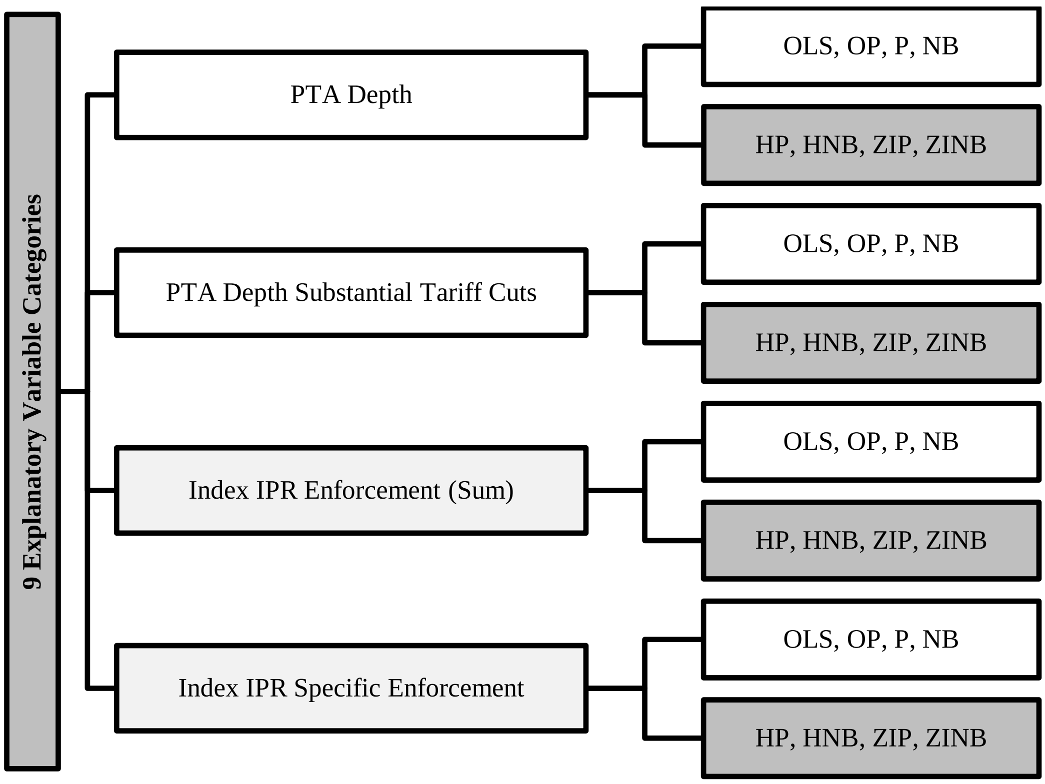
Figure 11: Design Model Specifications IIa



Secondly, the explanatory variables for stringent IPRs include the category of endogeneity operationalised by the four variables of *PTA depth*, *PTA depth substantial tariff cuts*, the *index IPR enforcement (sum)*, and the index *IPR specific enforcement*. As the second one is a subset of the first variable, and the fourth is a subset of the third one, they could not be included in the same model. Hence, the nine explanatory variable categories were analysed in four different constellations. *PTA depth* is included in one model with the *index IPR enforcement (sum)*, and in another model with the index *IPR specific enforcement*. The same applies to *PTA depth substantial tariff cuts*. Thus, for each of the nine explanatory variable categories, I made a further model alteration to account for the endogeneity variables.

Besides these selective steps for the economic power asymmetry, domestic interest, path dependency and endogeneity variables, all other explanatory variables are included. For each of these stringent IPR model specifications the same eight models were run as for general IPR: four single-stage models OLS, OP, P and NB as well as four two-stage models HP, HNB, ZIP, ZINB. For example, the stringent IPR variable *Index IPR scope tangible (sum)* was testes for each of the nine categories such as economic power using the four different endogeneity combinations such as *PTA depth* and the *index IPR enforcement (sum)* for the four single-stage models such as Poisson as well as the four two-stage models such as the hurdle with negative binomial distribution for the count data. The second model specification is illustrated in *Figure 12*.

Figure 12: Design Model Specifications IIb



For the two stringent IPR DVs *Index IPR specific (sum)* and *Index IPR specific enforcement (sum)*, I created only two endogeneity models per explanatory variable category as these variables include either a subset or the entire measure of the enforcement variables. *Table 29* provides an overview of all the final models created per dependent variable

Table 29: Model Overview for Design Analysis

Variables	Number of DVs	Variations	Number of Models	Model Label
Dependent Variables (DVs)	**48**		**8216**	
General IPR				
Index IPR general (sum)	1	8	8	m1
Index IPR scope mentioned (sum)	1	8	8	m2
Binary variables for IPR scope mentioned	11	8	88	m3a-m3k
Index IPR general enforcement (sum)	1	8	8	m4
Index IPR multilateral coherence dummy (sum)	1	8	8	m5
Stringent IPR				
Index IPR specific (sum)	1	9x2x8	144	m6
Index IPR scope tangible (sum)	1	9x4x8	288	m7
Binary variables for IPR scope tangible	11	9x4x8	3168	m8a-m8k
Index IPR specific enforcement (sum)	1	9x2x8	144	m9
Index IPR multilateral coherence (sum)	1	9x4x8	288	m10
Index TRIPS-plus (sum)	1	9x4x8	288	m11
Additive variables for TRIPS-plus categories	13	9x4x8	3744	m12a-m12m
IPR DSM				
Index IPR DSM (dummy)	1	8	8	m13
IPR Enforcement				
Index IPR general enforcement (sum)	1	8	8	m14a
Index IPR specific enforcement (sum)	1	8	8	m14b
Index IPR enforcement (sum)	1	8	8	m14c

Beside varying the model specifications, I checked for multicollinearity amongst the explanatory variables. In most models, at least some of the explanatory variables do correlate significantly amongst each other. For each model I, thus, calculated the variance inflation factor (VIF), which identifies "*sampling variance affected by correlation among the explanatory variables*" (Wooldridge 2013, 860). I calculate the VIF for each explanatory variable according the formula $VIF_j = \frac{1}{1-R_j^2}$ (Wooldridge 2013, 98). In economic analysis, the VIF should ideally take a score below '10' to ensure that multicollinearity is not a problem among the explanatory variables. However, if some variables that are necessary for the theoretical argument indicate a high VIF score, these variables can still be kept in the model:

> "If we think certain explanatory variables need to be included in a regression to infer causality of x_j, then we are hesitant to drop them, and whether we think VIF_j is "too high" cannot really affect that decision. If, say, our main interest is in the causal effect of x_1 on y, then we should ignore entirely the VIFs of other coefficients. Finally, setting a cutoff value for VIF above

which we conclude multicollinearity is a "problem" is arbitrary and not especially helpful. Sometimes the value 10 is chosen: If VIF_j is above 10 (equivalently, R^2_j is above .9), then we conclude that multicollinearity is a "problem" for estimating b_j. But a VIF_j above 10 does not mean that the standard deviation of $\hat{\beta}_j$ is too large to be useful because the standard deviation also depends on s and SSTj, and the latter can be increased by increasing the sample size." Woolridge (2013, 98)

Therefore, I do exclude those variables with a high VIF value, but also keep some variables that are beyond the threshold of ten and are necessary to test a theoretical argument. For example, where there are multiple variables to measure an explanatory argument such as with domestic interests and these variables have a high correlation amongst each other, I do exclude those with the highest VIF if they are not statistically significant. Those explanatory arguments operationalised by only one variable such as veto players are always kept within the model as otherwise their exclusion could introduce an explanatory bias.

Because the path dependency variables might have a high correlation, I also tested if there are linearly dependent variables amongst the seven different path dependency variable groups included for stringent IPR (see *Figure 11*). The tests showed that the variables for TRIPS-plus copyrights and TRIPS-plus trademarks for the path dependency from the world for both date of signature of the PTA (*plw_s_ipr_tripsplus_trademarks*) as the entry into force of the PTA (*plw_f_ipr_tripsplus_trademarks*) are aliases and that the trademark variables should be dropped. Therefore, none of the models will include this variable as its effects are represented by the copyright variable.

Across all tested models per DV, I display the regression tables of the ones that fit the data best. This entails that only one of the endogeneity variable combinations is displayed. I will illustrate the model selection for one of the general IPR indicators: the index IPR general (sum). For the model selection, I follow the path developed by Kleiber and Zeileis (2016), which compare the goodness of the model fit for count data regressions using rootograms and the Bayesian information criterion (BIC).

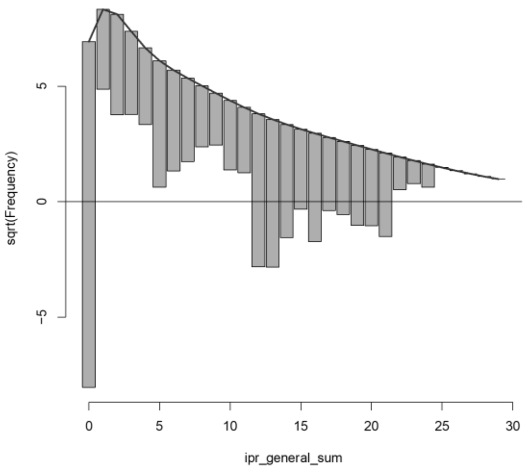
Firstly, I compute a rootogram that graphically displays the goodness of the model fit and is especially useful when dealing with count data affected by an excess of zeros. Usually when looking at regressions, one of the main indicators of the fit are the residuals or a comparison of the fitted towards the observed values by plotting them. However, if the dependent variable has considerably more zeros than assumed under a normal distribution, the residuals will be skewed by this excess of zeros, and the impact on the count data, i.e. those PTAs including IPRs, cannot be predicted accurately. The rootograms are an alternative way to display the fitted and observed values. Similarly to a histogram, the rootogram displays the bars of the observed respectively a line for the expected frequencies (Kleiber and Zeileis 2016, 297 et seqq.). I will use the so-called hanging rootograms, whereby the bars of the observed frequencies start below the line of the fitted frequencies, i.e. hang from it. The hanging rootograms have the benefit that their interpretation and comparison is clearer than for other forms of rootograms (see Kleiber and Zeileis 2016 for standing and suspended rootograms).

Graph 17 on the following page displays the hanging rootograms for the dependent variable of the index IPR general (ipr_general_sum) using the Poisson regression model (Poisson), the negative binomial regression model (Negative binomial), the hurdle model using Poisson distribution for the count data on the second stage of the model (Hurdle Poisson), the hurdle model using negative binomial distribution for the count data on the second stage of the model (Hurdle Negative Binomial), the zero-inflated model using a Poisson distribution for the count data on the second stage of the model (ZI Poisson), and the zero-inflated model using a negative binomial distribution for the count data on the second stage of the model (ZI Negative Binomial). The benefit of the rootogram is that besides showing the goodness of a model fit, it becomes obvious which count values are fitted well and which values are under- or overfitted. The closer the bars in the rootogram are to the horizontal reference line, the better do the fitted frequencies match the observed ones. Those bars that do not reach the horizontal reference line are overfitted by the model and those that exceed the horizontal reference line are underfitted. In a perfect model, all bars would therefore assemble close along the horizontal reference line. If the data includes an excess of zeros for the dependent variable, then the rootogram should indicate that for counts of ‘0’ the single-stage regression models are underfitted.

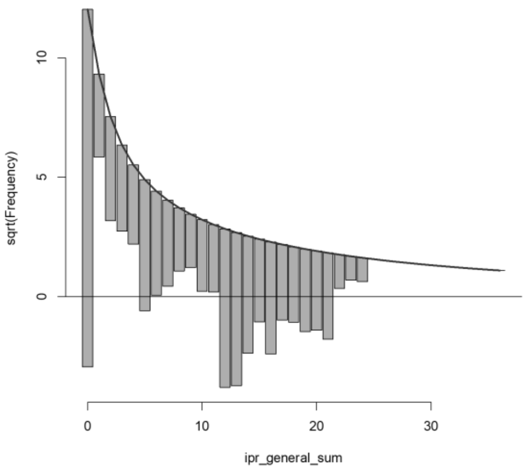
Graph 17 shows that for the single-stage regression models the zero count is massively underfitted as it reaches far beyond the horizontal reference line. The two-stage models have much better fit, whereby the zero-inflated models seem to fit slightly better than the hurdle models and the models using negative binomial distribution slightly better than those using a Poisson distribution. For all two-stage models the count of ‘1’, ‘2’, ‘12’, ‘13’, ‘16’ and ‘21’are underfitted and the counts of ‘7’-‘11’ overfitted. Even though the fit is not perfect, the two-stage models clearly have the better goodness of fit than the single-stage regression models.

Graph 17: Rootograms for Index IPR General (Range: 0-24)

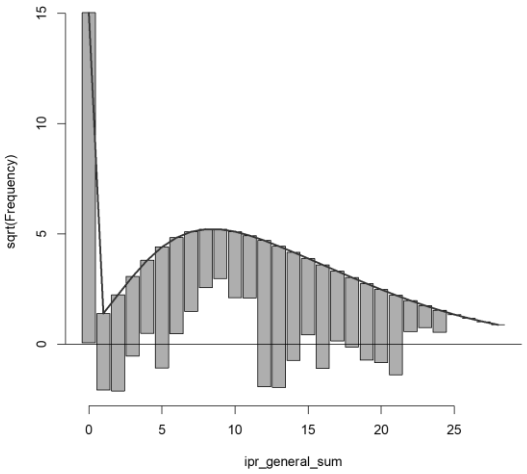
Poisson



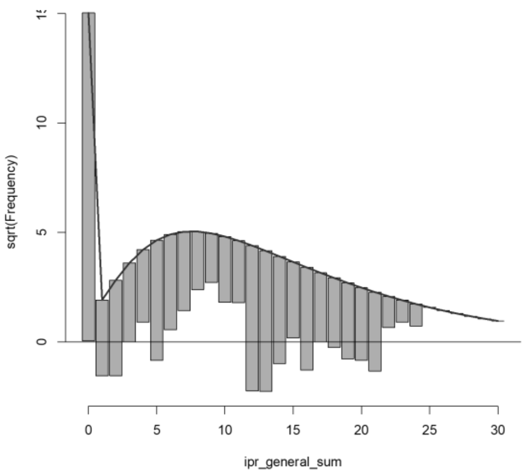
Negative Binomial



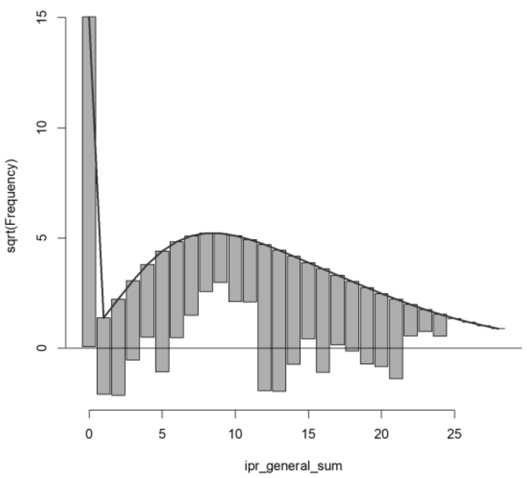
Hurdle Poisson



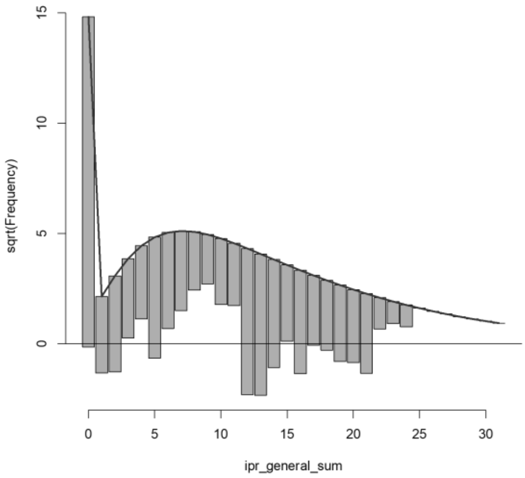
Hurdle Negative Binomial



ZI Poisson



ZI Negative Binomial



Secondly, Kleiber and Zeileis (2016) suggest to compare the relative performance of the tested models by using the BIC of the model types. Additionally to the BIC, I also include the Akaike information criterion (AIC) and compare both criterions. The lower the AIC and BIC value of a model, the better is the relative fit of the model. Most often in my analysis, both AIC and BIC identify the same model with the best fit, and do so very clearly. In a few cases, the AIC and BIC indicate different models having the best fit. In these instances, I display both models scoring highest on the information criterions. *Table 30* lists the AIC and BIC for the index IPR general and shows that out of the single-stage models, the order probit score best (lowest) on both AIC and BIC. From the two-stage models, the zero-inflated negative binomial model is the one scoring best on the AIC and BIC.

Table 30: AIC & BIC Comparison for Index IPR General Models

Index IPR General	**AIC**	**df**	**BIC**	**df**
OLS	3'249.3	36	3'405.9	36
Ordered Probit	**2'296.0**	**58**	**2'548.4**	**58**
Poisson	3'716.5	35	3'868.8	35
Negative Binomial	2'961.2	36	3'117.8	36
Hurdle Poisson	2'417.9	70	2'722.5	70
Hurdle Negative Binomial	2'383.2	71	2'692.1	71
ZI Poisson	2'418.3	70	2'722.8	70
ZI Negative Binomial	**2'364.9**	**71**	**2'673.8**	**71**

To test the goodness of fit across different models, previous studies have also applied the Vuong test. However, Wilson (2015). argues that the Vuong test is misused and statistically not applicable for testing zero-inflation. I follow his rationale, do not apply the Vuong test and rely on the comparison between AIC and BIC to test the goodness of fit for all dependent variables. These AIC and BIC tables are displayed in *Appendix 19: Model Fit of* . Unlike stated in my theoretical argumentation, the AIC and BIC comparison taken together with the illustration of the rootograms shows that the ordered probit and the zero-inflated model using negative binomial distribution fit the data better for the index IPR general than all other model types, even hurdle models.

Over all DVs, there is not a particular model type that always fits best. Often, the ordered probit models show the best fit according to the AIC and BIC. However, the ordered probit can less accurately describe the variation in the design than a two-stage model, which allows to draw conclusions on the variation amongst those PTAs that include something on the DV on the second stage of the model. Therefore, I also display the best fitting two-stage models where applicable. In the following subchapter, I display the regression tables of the best fitting models for all dependent variables and analyse their results. The model specifications are based on *Table 29: Model Overview for Design Analysis*, whereby the model number indicates the dependent variable followed by the regression specification such as 'op' for ordered probit or 'zinb' for zero-inflated negative binomial.

4.3 Design: Analysis

The order for the analysis of the design of IPRs in PTA follows the dependent variables, starting with the operationalisation of general IPR (*4.3.1*), followed by stringent IPR (*4.3.2*), IPR dispute settlement mechanisms (*4.3.3*) and concluded by IPR enforcement (*4.3.4*). In the subsequent subchapter (*4.3.5*), I summarise the most significant results of the regression analysis and provide an overview matching the postulated hypotheses to the results of the regression analysis (*Table 51*).

All regression tables follow the same structure. The first column shows the explanatory variables used to explain the dependent variable of the respective subchapter and table caption. The following columns include the results of the regression for the best fitting models, whereby the type of model is described in the last three rows of the table, followed by the number of observations. For the two-stage models, the regression table displays two columns. The first column shows the results for the second stage and thus the count data, and following column illustrates the estimates for the first stage of the model.

The OLS and ordered probit models can be interpreted by looking at the estimates and interpreting their positive or negative impact on the dependent variable. However, the coefficients of the other models have to be exponentiated (*exp(estimates)*) in order to draw conclusions on their impact (see Gelman and Hill 2006, 111). Besides this interim stage for the coefficient interpretation, the zero data of the hurdle and ZI models follow a different logic. Whilst a hurdle model shows the odds of non-zeros for the zero data (positive scores on the DV), the zero data of the ZI model shows the odds of (structural) zeros in the DV (Loeys et al. 2012, 170; Zeileis, Kleiber, and Jackman 2008, 19). Hence, the logic of interpretation is inverted for the zero data of hurdle and ZI models. The estimate for the zero data of the ZI indicates the log odds of being an excessive zero. Hence, a positive estimate on the zero data in the ZI model shows the log odds of not scoring on the DV, whereas a positive estimate on the zero data in the hurdle model shows the odds of including the DV. For the count data, the difference between hurdle and ZI models is that the count data of hurdle model shows only those cases that include something on the DV (score > 0), whereas the ZI models also include PTAs that do not include anything on the DV (score ≥ 0). The description of the indexes used as dependent variables can be found in subchapter *3.2.3 Dataset Development*.

4.3.1 General IPR Design Analysis

The subsequent subchapters display the regression tables for each of the dependent variables capturing general IPR. The postulated explanatory factors for general IPRs are domestic interests (*H3.1, H3.2*) veto players (*H4.1*, *H4.3*), regime preference (*H6.1*) and path dependency (*H7.1, H7.2*) (see *Table 23: Overview of IPR Design Features, Explanatory Factors and Hypotheses*).

For all of these factors, the regression analyses show significant results. Yet, the general IPR design features are influenced the most by domestic interests variables.

4.3.1.1 Index IPR General (sum)

The regression analysis for the Index IPR general is displayed in *Table 31* on the following pages. It shows that some of the domestic interests variables, the veto players, the regime preference, and some of the path dependency variables as well as some of the control variables have a significant effect on the general IPR variables in PTAs. As to be expected, not all of the tested variables for the categories of domestic interests and path dependency show the same level of significance. Similarly, the direction of the effects also is sometimes positive and negative for the explanatory variables, depending on the used measure.

Domestic interests have both significantly positive as well as negative effects on the general IPR content of PTAs. However, most of the included variables for domestic interest have a minimal impact on general IPR (*estimates < 1*). For example, a significantly positive effect can be observed for the received charges for the use of IP (*0.028*) and the number of researchers in R&D (*0.054*), whereas R&D expenditure (*-0.159*) have a significantly negative effect on the general IPR content. A more sizeable impact can be observed for the industrial design applications by PTA members in relation to the total applications for industrial designs (cumulative), which has a significantly positive effect on the zero stage of the two-stage model. The log odds of being an excessive zero increase by *27.955* for every one-unit change in the total applications for industrial designs (cumulative). This means that with an increased share that PTA members have amongst the industrial design applications of another PTA member, they are more likely not to include general IPR provisions in their PTAs.

Amongst the domestic interest measures, the technology-intensiveness variables have the highest estimates and show a significant effect on the general IPR content of PTAs. They show that an increase in the share of PTA members imports of medium-high-technology products has a significantly negative effect on the general IPR content of the PTAs (*-13.97*). More so, the expected change in log(index general IPR) for a one-unit increase in imports of low-technology products (*ltp*) by PTA members as a share of the total *ltp* imports is *-25.43* holding all other variables constant. This means that the more of the total lt products are imported from PTA partners, the less general IPR content is within the PTAs. A positive effect can be observed for medium-low-technology products (*mltp*). Hereby, the expected change in log(index general IPR) for a one-unit increase in imports of *mltp* by PTA members as a share of the total *mltp* imports is *32.71* holding all other variables constant, respectively *31.471* for the OP model. This indicates that the higher the share of PTA members imports of mlt products, the more general IPR content the PTA includes.

Veto players have a significantly negative effect on the Index IPR general. This means that the more veto players there are amongst PTA members, the lower the general IPR content of the PTA. This is along the line of the theoretical assumptions about veto players, yet the significant estimate is comparatively low (*-0.172*). However, the low estimate also reflects that the analysis concerns general IPR, which might be less conflictual amongst veto players than more specific provisions.

Regime preference also has a significantly positive impact on the general IPR content of PTAs, yet on a shallow level (*estimate < 0.04*). The zero stage of the two-stage model shows that regime preference has a significantly negative impact on the PTAs chances of not including any general IPR (*-2.019*). And the second stage implies that the more IPR multilateral coherence references a PTA includes, the higher is also the general IPR content of the PTA (exp(*0.009*)= *1.009*).

Table 31: Design Regression – Index IPR General (sum)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests			
ln Charges for the use of IP, receipts (sum)	0.028* (0.011)	0.008 (0.007)	-0.038* (0.019)
ln Resident applications for patents (sum)	-0.082 (0.071)	-0.105* (0.047)	-0.037 (0.118)
ln Resident applications for trademarks (sum)	0.085 (0.077)	0.103. (0.053)	-0.005 (0.102)
ln Resident applications for patents (cumulative, sum)	0.105 (0.069)	0.124** (0.041)	0.062 (0.122)
ln Resident applications for trademarks (cumulative, sum)	-0.118 (0.079)	-0.183*** (0.052)	0.027 (0.115)
Applications for patents by PTA members / total applications for patents	0.474. (0.263)	-0.137 (0.115)	-3.896. (2.019)
Applications for trademarks by PTA members / total applications for trademarks	0.077 (0.165)	0.101 (0.079)	-0.395 (0.488)
Applications for patents by PTA members / total applications for patents (cumulative)	-44.789 (44.143)	-36.21 (22.43)	-59.491 (252.831)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	-1.898 (1.6)	0.157 (0.716)	27.955* (11.133)
Number of researchers in R&D (sum)	0.054** (0.018)	0.014 (0.009)	0.022 (0.047)
R&D expenditure (sum)	-0.159* (0.075)	-0.005 (0.038)	-0.046 (0.211)
Imports of mhtp by PTA members (sum)	0.071* (0.036)	0.024 (0.017)	-0.194. (0.108)
Imports of mltp by PTA members (sum)	-0.027 (0.037)	0.005 (0.017)	0.165 (0.119)
Imports of htp by PTA members / total htp imports	2.514 (3.771)	-3.163 (1.957)	-4.006 (14.244)
Imports of mhtp by PTA members / total mhtp imports	-13.97*** (3.686)	-4.367* (2.058)	16.548 (11.528)
Imports of mltp by PTA members / total mltp imports	31.471. (19.067)	32.71*** (9.87)	-19.644 (80.147)
Imports of ltp by PTA members / total ltp imports	-11.811 (14.122)	-25.43*** (7.447)	20.596 (75.116)
Veto Players			
Veto players (sum)	-0.172*** (0.051)	-0.047 (0.028)	0.156 (0.114)
Regime Preference			
Index IPR multilateral coherence (sum)	0.032*** (0.002)	0.009*** (0.001)	-2.019*** (0.605)
Path Dependency			
Index based on binary IPR scope mentioned pl – copyrights	-0.012 (0.131)	-0.237*** (0.064)	-1.074** (0.343)
Index based on binary IPR scope mentioned pl – trademarks	0.164* (0.067)	0.069* (0.033)	-0.216 (0.253)

Index based on binary IPR scope mentioned pl – geographical indications	-0.067 (0.138)	0.216** (0.066)	1.04* (0.425)
Index based on binary IPR scope mentioned pl – layout-designs of integrated circuits	-0.009 (0.102)	-0.044 (0.052)	-0.627* (0.29)
Index based on binary IPR scope mentioned pl – new plant varieties	-0.064* (0.032)	-0.015 (0.015)	0.507* (0.256)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	-0.088* (0.039)	-0.013 (0.017)	-0.632* (0.261)
Index based on binary IPR scope mentioned pl – domain names	-0.019 (0.089)	-0.018 (0.038)	-0.742. (0.419)
Index IPR general enforcement pd (sum)	0.033*** (0.01)	0.011** (0.004)	0.162* (0.08)
Control Variables			
Democratisation (Polity 2) (mean)	0.05*** (0.014)	0.017* (0.008)	-0.034 (0.027)
Classic IP leaders	0.418* (0.2)	0.124 (0.082)	0.792 (0.771)
Countries with a high increase of patent protection	-0.225 (0.173)	0.255** (0.093)	1.149* (0.497)
New IP producers and developers	0.487** (0.166)	0.12. (0.071)	0.112 (0.646)
ln GDP (mean)	-0.042 (0.065)	0.012 (0.036)	-0.092 (0.148)
ln GDPpc (mean)	0.291*** (0.071)	0.055 (0.038)	-0.244. (0.137)
ln Geographic distance (mean)	-0.079 (0.062)	-0.014 (0.031)	0.183 (0.14)
Intercept	–	1.582* (0.718)	3.906 (2.965)
log(theta)	–	2.606*** (0.203)	–
Model	m1op_f	m1zinb_f	m1zinb_f
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	573	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Path dependency has significantly positive as well as negative effects on general IPR provisions. The estimates are comparatively low (< 1.08). Those PTA members already mentioned copyrights, new plant varieties and encrypted program-carrying satellite signals in their previous PTAs include a little less general IPR provisions in their PTAs compared to those that did not mention them in previous PTAs. And those PTA members that mentioned trademarks or general enforcement provisions in their PTAs include a little more general IPR provisions compared to those members that did not include such provisions in their previous PTAs.

Control variables have a significantly positive impact on general IPR in PTAs, which is comparatively minor (*estimates* < *1.2*). The most substantial positive effect is observed if the classic IP leaders (*0.418*) or new IP producers and developers (*0.487*) are part of the agreement. This means that if the US, EU, EFTA, or Japan resp. Israel, South Korea, Singapore or Taiwan are amongst the PTA members, the general IPR content increases.

4.3.1.2 Index IPR Scope Mentioned (sum)

The second operationalisation of general IPR content is the index IPR scope mentioned, which codes how many of the eleven IPR forms are covered by the PTA. Its regression analysis is displayed in *Table 32* for the ordered probit and ZIP model. The explanatory factor with the highest significant impact on the IPR scope mentioned in PTAs are the domestic interests.

Domestic interests have significantly negative and positive effects on the IPR scope mentioned in PTAs. Similar to the effects observed for the index IPR general, the imports divided according to their technology intensiveness have a strong effect on the DV. The larger the import share of ht, mht and lt products by PTA members, the fewer IPR forms are included. The most significant effect can be observed for medium-low-technology products (*mltp*), whereby the expected change in log(index IPR scope mentioned) for a one-unit increase in imports of *mltp* by PTA members as a share of the total *mltp* imports is *46.94* holding all other variables constant. However, the index IPR scope is affected the most by the cumulative share of applications for patents by PTA members. The expected change in log(index IPR scope mentioned) for a one-unit increase in the cumulative share of applications for patents by PTA members is *-96.02* holding all other variables constant. This means that the more patent applications PTA members make in a PTA member countries, the fewer IPR forms are mentioned in PTAs. This effect is mostly driven by the relationship with the mentioning of industrial designs, patents, undisclosed information, layout designs of integrated circuits and domain names as part of the index IPR scope mentioned (see *Appendix 20: Design Regression Tables of the Binary Variables for IPR Scope* Mentioned).

Veto players have a significantly negative effect on the scope of IPRs mentioned in PTAs, yet the odds ratio are only decreased by *-0.113*. This means that an increase in the number of veto players has a minor negative effect on the number of IPR forms being mentioned in a PTA.

Table 32: Design Regression – Index IPR Scope Mentioned (sum)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests			
ln Charges for the use of IP, receipts (sum)	0.046*** (0.014)	0 (0.01)	-0.091*** (0.02)
ln Resident applications for patents (sum)	-0.143. (0.08)	-0.104. (0.059)	0.048 (0.109)
ln Resident applications for trademarks (sum)	0.179. (0.106)	0.097 (0.066)	-0.313. (0.173)
ln Resident applications for industrial design (sum)	-0.025 (0.053)	0.061. (0.034)	0.131. (0.073)
ln Resident applications for patents (cumulative, sum)	0.246** (0.077)	0.084. (0.047)	-0.273* (0.111)
ln Resident applications for trademarks (cumulative, sum)	-0.281** (0.099)	-0.163* (0.065)	0.446** (0.161)
Applications for patents by PTA members / total applications for patents	0.341 (0.219)	0.182. (0.108)	0.14 (0.415)
Applications for patents by PTA members / total applications for patents (cumulative)	-63.065 (40.846)	-96.02** (30.09)	-22.511 (64.841)
Number of researchers in R&D (sum)	0.039* (0.018)	0.009 (0.009)	-0.05. (0.029)
Imports of htp by PTA members (sum)	-0.066 (0.041)	0.02 (0.022)	0.161* (0.068)
Imports of mhtp by PTA members (sum)	0.096* (0.039)	0.003 (0.022)	-0.165* (0.065)
Imports of htp by PTA members / total htp imports	2.01 (4.225)	-9.566*** (2.596)	-38.337*** (10.193)
Imports of mhtp by PTA members / total mhtp imports	-11.147** (3.728)	-2.419 (2.28)	16.072* (6.262)
Imports of mltp by PTA members / total mltp imports	25.53 (19.782)	46.94*** (11.97)	96.167** (36.653)
Imports of ltp by PTA members / total ltp imports	-12.336 (15.203)	-34.68*** (9.576)	-73.073** (25.671)
Veto Players			
Veto players (sum)	-0.113* (0.044)	0.028 (0.028)	0.317*** (0.082)
Regime Preference			
Index IPR multilateral coherence (sum)	0.023*** (0.002)	0.004*** (0.001)	-0.074*** (0.01)
Path Dependency			
Index based on binary IPR scope mentioned pl – copyrights	-0.072 (0.06)	-0.122*** (0.033)	-0.114 (0.103)
Index based on binary IPR scope mentioned pl – patents	0.155** (0.06)	0.102** (0.035)	-0.054 (0.098)
Index based on binary IPR scope mentioned pl – new plant varieties	-0.094** (0.031)	-0.011 (0.016)	0.134* (0.056)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	-0.077. (0.041)	0.001 (0.018)	0.201** (0.076)

Index based on binary IPR scope mentioned pl – domain names	-0.099 (0.093)	-0.042 (0.043)	0.153 (0.201)
Index IPR general enforcement pd (sum)	0.034*** (0.01)	0.002 (0.004)	-0.078*** (0.023)
Control Variables			
Democratisation (Polity 2) (mean)	0.023 (0.014)	0.01 (0.008)	-0.023 (0.021)
Classic IP leaders	-0.142 (0.204)	0.03 (0.09)	-0.214 (0.469)
Countries with a high increase of patent protection	0.175 (0.183)	0.055 (0.111)	0.367 (0.3)
New IP producers and developers	0.113 (0.169)	0.117 (0.081)	0.438 (0.281)
ln GDP (mean)	-0.192** (0.071)	0.016 (0.045)	0.238* (0.115)
ln GDPpc (mean)	0.384*** (0.079)	0.087* (0.044)	-0.381** (0.117)
ln Geographic distance (mean)	-0.047 (0.068)	-0.101** (0.038)	-0.085 (0.097)
Intercept	–	1.514. (0.836)	-0.505 (2.186)
Model	m2op_f	m2zip_f	m2zip_f
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	573	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Regime preference shows a positive effect on the index IPR scope mentioned variable, but on an even lower level (*0.023*) than veto players. There is a positive correlation between including references to other IPR multilateral agreements and the number of IPR forms mentioned in PTAs, yet the other independent variables hold more explanatory power.

Path dependency effects the index IPR scope mentioned both positively and negatively. Additionally to the negative effects observed for the path dependency measures copyrights, new plant varieties, encrypted program-carrying satellite signals in the analysis of the index IPR general, here, also path dependency for domain names has a negative impact on the IPR scope mentioned in PTAs. Positive impacts have the path dependency measures for patents and enforcement, whereas path dependency for trademarks has no significant effect. Again, all effects take place on a low estimate level and are surpassed by the explanatory power of the domestic interest variables.

Control variables have a significant effect on the DV. A higher average GDP (log) amongst PTA members has a negative effect on the scope of IPR mentioned in the PTA, whereas the average GDP per capita (log) has a positive impact. The expected change in log(DV) for a one-unit increase in the geographical distance (log) is *-0.101* holding all other variables constant. This means that the further apart PTA members are the fewer IP scope variables they include in their PTAs. Again, the control variables have a comparatively low-level impact next to the domestic interest variables.

4.3.1.3 Binary Variables for IPR Scope Mentioned

Besides testing the scope by regressing the index, I also analysed the results for the eleven individual IPR forms. Their regression Tables can be found in *Appendix 20: Design Regression Tables of the Binary Variables for IPR Scope* Mentioned.

The analysis shows that the previously observed dominant effect of ***domestic interests*** is far less pronounced for copyrights and traditional knowledge & genetic resources. ***Veto players*** have a mostly significantly negative effect, most pronounced for copyrights (-*0.218*) and geographical indication (-*0.253*). This means that the more veto players there are amongst PTA members, the less likely it is that they mention copyrights or geographical as being protected by IPRs. The effect for ***regime preference*** remains mostly the same as for the index IPR scope mentioned and is most pronounced for geographical indications (*0.05*).

Path dependency varies more broadly across the different scope variables. The individual regression tables show that not all forms of PTAs repeat previously mentioned IPR forms. For example, there is no significant effect of path dependency of copyrights for the dependent variable on copyright mentioned. The postulated significantly positive effect of path dependency can only be observed for geographical indications, patents, traditional knowledge & genetic resources. The significantly positive effect of the policy variable for enforcement shown for the overall IPR scope mentioned is mainly driven by domain names (*0.527*) as the other IPR forms achieve much lower estimates.

Control variables show that for some DVs, there is a significantly positive effect of democratisation, and for most DVs, a significantly positive effect of GDPpc (log). The other control variables mostly show no significantly positive effects except patents is positively affected if classic IP leaders are part of the agreement (*0.698*) or encrypted program-carrying satellite signals are positively affected if new IP producers and developers are members of the PTA (*1.327*). A significantly negative effect can be observed for GDP (log) and geographical distance for most DVs.

For the binary variables, the domestic interests are also the independent variables with the highest explanatory power.

4.3.1.4 Index IPR General Enforcement (sum)

The general enforcement measure is taken as a proxy for general IPR and is additionally analysed as a proxy for IPR enforcement with a focus on veto players (*4.3.4 IPR Enforcement Design Analysis*). Here, as a proxy for general IPR, the analysis includes also the other explanatory factors besides veto players.

Table 33 displays the OP and ZIP models for the index IPR general enforcement. The most distinct explanatory factor is domestic interests, thus, following the impression from the previous measures for general IPR.

Domestic interests have both significantly positive and negative effects on the general IPR enforcement provisions in PTAs. Similar to the other measures for general IPR, the technology intensiveness of the imported products has the most effect on the DV. The share of import of *mltp* has a positive effect (*51.215*), whereas the *mhtp* (*-16.525*) and *ltp* (*-53.801*) share of imports by PTA members have a negative effect on the general IPR enforcement content of PTAs. Thus, when a large share of the *mltp* imports come from PTA members, then the PTA includes more general IPR enforcement provisions, and less the higher the share of imports of *mhtp* and *ltp* is by PTA members.

Veto players have a significantly negative effect on general IPR enforcement *(-0.173*), meaning that there are fewer general IPR enforcement measures in a PTA, the more veto players there are amongst PTA members. The effect of ***regime preference*** is significantly positive (*0.029*), meaning that the more and the more binding IPR multilateral agreements are referenced, the more general enforcement provisions are in a PTA. Same as with the previous measures for general IPR, the effect only has a low estimate, meaning that the impact of a one-unit change is limited.

Path dependency shows significantly positive as well as negative effects. The path dependency for general IPR, i.e. the overall scope as the enforcement measures are deducted, and the path dependency from patents have both a significantly positive effect on the index IPR general enforcement. This means that those PTAs, where PTA members already mention IPR forms and especially patents, are more likely also to include general IPR enforcement provisions. However, the path dependency for layout-design of integrated circuits is negative. Thus, when PTA members mentioned layout-design of integrated circuits in their previous PTAs, they are less likely to include general IPR enforcement provisions in their current PTAs.

Table 33: Design Regression – Index IPR General Enforcement (sum)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests			
ln Resident applications for patents (sum)	-0.071 (0.089)	-0.051 (0.082)	14.646. (8.066)
ln Resident applications for trademarks (sum)	0.177 (0.13)	0.016 (0.107)	-42.145. (21.975)
ln Resident applications for industrial design (sum)	0.109. (0.061)	-0.035 (0.063)	-16.179* (8.088)
ln Resident applications for patents (cumulative, sum)	-0.024 (0.08)	-0.075 (0.071)	-18.731. (10.27)
ln Resident applications for trademarks (cumulative, sum)	-0.199. (0.115)	0.113 (0.106)	53.592. (27.801)
Number of researchers in R&D (sum)	0.047* (0.02)	0.026 (0.019)	-2.489. (1.321)
R&D expenditure (sum)	-0.16* (0.08)	-0.061 (0.072)	-2.361 (4.585)
Imports of mhtp by PTA members (sum)	0.055** (0.021)	0.034* (0.016)	-1.48 (1.319)
Imports of ltp by PTA members (sum)	0.02 (0.019)	-0.011 (0.013)	-4.297 (2.86)
Imports of htp by PTA members / total htp imports	0.204 (4.008)	-0.371 (3.976)	-278.8 (205.348)
Imports of mhtp by PTA members / total mhtp imports	-16.525*** (4.119)	-6.264. (3.426)	715.734* (361.466)
Imports of mltp by PTA members / total mltp imports	51.215* (22.914)	15.408 (18.715)	-361.513 (647.598)
Imports of ltp by PTA members / total ltp imports	-53.801** (20.006)	-11.188 (16.37)	324.64 (365.092)
Veto Players			
Veto players (sum)	-0.173*** (0.046)	0.028 (0.052)	28.405* (14.314)
Regime Preference			
Index IPR multilateral coherence (sum)	0.029*** (0.002)	0.01*** (0.002)	-4.935* (2.49)
Path Dependency			
Index IPR general pd (sum)	0.017* (0.007)	0.004 (0.004)	-4.192* (2.121)
Index based on binary IPR scope mentioned pl – copyrights	-0.061 (0.099)	0.009 (0.082)	17.804. (9.241)
Index based on binary IPR scope mentioned pl – patents	0.295*** (0.073)	0.018 (0.067)	-26.624. (15.815)
Index based on binary IPR scope mentioned pl – layout-designs of integrated circuits	-0.199. (0.109)	-0.07 (0.085)	8.389 (9.065)

Index based on binary IPR scope mentioned pl – traditional knowledge & genetic resources	-0.014 (0.02)	0.004 (0.014)	11.653* (5.364)
Control Variables			
Democratisation (Polity 2) (mean)	0.107*** (0.018)	0.035* (0.015)	-4.347. (2.335)
Classic IP leaders	0.333 (0.212)	0.324* (0.15)	69.011. (38.382)
Countries with a high increase of patent protection	-0.361. (0.192)	-0.136 (0.155)	6.81 (5.239)
New IP producers and developers	0.858*** (0.172)	0.31** (0.117)	-49.342. (27.366)
ln GDP (mean)	0.217** (0.075)	0.151* (0.076)	13.318 (8.373)
ln GDPpc (mean)	-0.014 (0.084)	-0.049 (0.074)	-15.432. (8.514)
ln Geographic distance (mean)	-0.072 (0.07)	0.072 (0.06)	19.623* (9.753)
Intercept	–	-4.593*** (1.363)	-337.86. (191.834)
Model	m4op_f	m4zip_f	m4zip_f
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	573	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

All of the ***control variables*** have a significant effect on some part of the models. The most distinct one is the positive effect of new IP producers and developers. Thus, if Israel, South Korea, Singapore or Taiwan are members of the PTA, then the odds ratio of the PTA including general IPR enforcement variables increases by *0.858*. Across the other control variables, democratisation, classic IP leaders and the average GDP (log) have a positive effect and the others a negative effect on the Index IPR general enforcement.

4.3.1.5 Index IPR Multilateral Coherence Dummy (sum)

Table 34 illustrates the regression analysis for the index IPR multilateral coherence dummy. The term ‘dummy’ refers to the fact that the measure only accounts for reference of an IPR multilateral agreement and disregards the bindingness of the commitment (see *3.2.3 Dataset Development*).

Domestic interests have both positive and negative effects on the DV. Like for the other general IPR variables, there are multiple significant effects, yet many with a comparatively low estimate. For example, the number of researchers in R&D (*0.11*) has a significantly positive and the R&D expenditure (*-0.202*) a significantly negative effect on the number of IPR multilateral agreements referenced in PTAs. The most substantial effect can be observed for *htp* and *mhtp* imports. Whereas for the other general IPR measures, the effect is highest for *mltp* and *ltp* import shares, and here, the *htp* and *mhtp* shares have the highest impact. The share of imports of *htp* by PTA (*6.697*) has a significantly positive and the share of imports of *mhtp* by PTA (*-10.289*) a significantly negative effect on the index IPR multilateral coherence. This means that the higher the share of *htp* imports from PTA members and the lower the share of *mhtp* imports from PTA members, the more IPR multilateral agreements are referenced in the PTA.

Table 34: Design Regression – Index IPR Multilateral Coherence Dummy (sum)

Explanatory Variables	Estimates (Std. Error)
Domestic Interests	
ln Resident applications for patents (sum)	-0.124 (0.086)
ln Resident applications for trademarks (sum)	0.039 (0.085)
ln Resident applications for industrial design (sum)	0.2* (0.087)
ln Resident applications for patents (cumulative, sum)	0.235* (0.092)
ln Resident applications for trademarks (cumulative, sum)	0.003 (0.105)
ln Resident applications for industrial design (cumulative, sum)	-0.126 (0.1)
Applications for patents by PTA members / total applications for patents	-0.563* (0.261)
Applications for trademarks by PTA members / total applications for trademarks	0.598*** (0.175)
Applications for industrial designs by PTA members / total applications for industrial designs	-0.228 (0.149)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	-0.818 (1.991)
Number of researchers in R&D (sum)	0.11*** (0.019)
R&D expenditure (sum)	-0.202* (0.079)
Imports of htp by PTA members (sum)	0.02 (0.038)
Imports of mhtp by PTA members (sum)	0.054 (0.037)
Imports of ltp by PTA members (sum)	-0.048** (0.017)
Imports of htp by PTA members / total htp imports	6.697. (3.541)

Imports of mhtp by PTA members / total mhtp imports	-10.289*** (2.835)
Veto Players	
Veto players (sum)	-0.184*** (0.056)
Path Dependency	
Index based on binary IPR scope mentioned pl – undisclosed information	-0.106 (0.11)
Index based on binary IPR scope mentioned pl – layout-designs of integrated circuits	0.129 (0.106)
Index based on binary IPR scope mentioned pl – new plant varieties	-0.064. (0.033)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	-0.019 (0.04)
Index based on binary IPR scope mentioned pl – domain names	0.229** (0.089)
Index IPR general enforcement pd (sum)	0.035*** (0.01)
Control Variables	
Democratisation (Polity 2) (mean)	0.044** (0.015)
Classic IP leaders	0.542** (0.209)
Countries with a high increase of patent protection	-0.099 (0.18)
New IP producers and developers	-0.113 (0.167)
ln GDP (mean)	-0.213* (0.09)
ln GDPpc (mean)	0.191* (0.082)
ln Geographic distance (mean)	-0.024 (0.066)
Model	m5op_f
Observations	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Veto players have a significantly negative effect on the number of IPR multilateral agreements included in PTAs (*-0.184*). Thus, the more veto players there are amongst PTA members, the fewer IPR multilateral coherence agreements are mentioned in PTAs.

Path dependency has only a few significant effects. The effect is significantly negative for new plant varieties (*-0.064*) and significantly positive for domain names (*0.229*) and general IPR enforcement (*0.035*). This means that if countries included new plant varieties in their previous PTAs it slightly decreases the odds of referencing IPR multilateral agreement in their current PTAs. So, those countries, that have mentioned domain names or general IPR enforcement are more likely to include references to IPR multilateral agreements in their present PTAs.

Control variables have mostly positive effects on the index IPR multilateral coherence. Democratisation (*0.044*), classic IP leaders (*0.542*) and the average GDPpc (log; *0.191*) all have a significant positive effect on IPR multilateral coherence. This is mostly in line with the results for the other general IPR measures. For the classic IPR leaders, this means that if the US, EU, EFTA or Japan are part of the PTA, the PTA is more likely to include a reference to an IPR multilateral agreement. The average GDP (log) is the only control variable with a significantly negative effect on the DV (*-0.213*). Geographical distance, which has shown significant effects on the other general IPR measures, has no significant effect on the index IPR multilateral coherence, i.e. the referenced IPR multilateral agreements in PTAs.

4.3.2 Stringent IPR Design Analysis

To explain the dependent variables used for stringent IPR, all of the postulated explanatory factors are tested: economic power asymmetry (*H1.1*, *H1.2*, *H1.3*), political pressure (*H2*), domestic interests (*H3.1*, *H3.2*), veto players (*H4.2*, *H4.3*), endogeneity (*H5.1*, *H5.2*, *H5.3*, *H5.4*), regime preference (*H6.1*, *H6.2*, *H6.3*, *H6.4*) and path dependency (*H7.1*, *H7.3*) (see *Table 23: Overview of IPR Design Features, Explanatory Factors and Hypotheses*).

The explanatory factors for economic power asymmetries (model abbreviation: *epa*), domestic interests (*di*), and seven different operationalisations of policy analysis (*pdg*, *pds*, *pdtp*, *pdwss*, *pdwstp*, *pdwfs*, *pdwftp*) are tested in separate models (see *Figure 11: Design Model Specifications IIa*). Every subchapter will start with those variables not included in all regression models, namely, economic power asymmetry, domestic interests and path dependency. Afterwards, I summarise the results for political pressure, veto players, endogeneity, regime preference and the control variables, which are included in all models. Not all nine models per dependent variable are displayed in the following subchapters, only those of particular interest. Those models not displayed are referenced in the text and included in the appendix.

As for the results, the regression models for stringent IPR show significant results for all the tested explanatory factors. However, the economic power asymmetry variables have the highest significant effect on stringent IPR provisions. However, the data availability is considerably lower than for all other measures, and the number of observations drops from 529 for the other models to 392 for the *epa* models. Thus, significant amounts of the PTAs are not covered in the *epa* regression models.

4.3.2.1 Index IPR Specific (sum)

For the index IPR specific, I display the model for economic power asymmetry in *Table 35*, the model for domestic interests in *Table 36* as well as the model for specific path dependency from worldwide TRIPS-plus provisions in PTAs by the time of signature (*pdwstp*) in *Table 37*.

Economic power asymmetry has a significant effect on the index IPR specific. The expected change in log(index IPR specific) for a one-unit increase in GDP asymmetry is *68.302* resp. *-57.034* for GDP per capita asymmetry, holding all other variables constant. Thus, PTAs with a greater GDP asymmetry between PTA partners include more specific IPR provisions and PTAs with an increased asymmetry of the living standards between PTA partners contain less specific IPR provisions. Accordingly, it is more likely that countries with similar living standards include specific IPRs in their PTAs, especially if one of these countries has a considerably larger GDP than the other.

A significantly negative effect can also be observed for the interaction term of GDP asymmetry with substantial tariff cuts. The expected change in log(index IPR specific) for a one-unit increase in the interaction term is *-29.033* holding all other variables constant. The log odds of being an excessive zero decrease immensely for a one-unit increase in the interaction term, by *-435.832*. As substantial tariff cuts are a binary variable, the one-unit change is bound to the PTA either including substantial tariff cuts or not. Thus, those PTAs including a substantial tariff cut are much less likely to be in the excessive zero group, and with the additional increase of the GDP asymmetry, the PTAs are less likely to include specific IPR provisions. This means that in combination with substantial tariff cuts in the PTA, the GDP asymmetry has an inverted effect on specific IPR commitments. There are no significant effects for the same interaction terms with GDP per capita asymmetry.

The interaction term of GDP asymmetry with FDI (log) has a significantly negative effect on specific IPR provisions (*-1.518*) and the interaction term of GDP per capita asymmetry and FDI (log) a significantly positive effect (*1.416*). Both are only significant for the count data of the ZINB model and not the OP model. Thus, the combination of high GDP asymmetry and high FDI most likely affects how many IPR provisions are included then the decision if they are included or not.

The interaction term of GDP asymmetry with official development assistance and official aid received (log) as well as its GDP per capita counterpart show no significant effects on the index IPR specific. However, the interaction term of GDP asymmetry with the share of DAC aid received by PTA members of the total DAC aid received has a significantly negative effect (*-20.958*) and the GDP per capita interaction term a positive one (*18.437*). It is the only effect of the economic power asymmetry variables on the index IPR specific with significant estimates for both the OP and the ZINB *epa* model. The effect shows that an increase of the GDP asymmetry in combination with the share of DAC aid received by PTA members of the total DAC aid received leads to less specific IPR commitments in PTAs, whereas in combination with the GDP per capita, the effect is positive.

Table 35: Design Regression – Index IPR Specific (sum) ~ Economic Power Asymmetry

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Economic Power Asymmetry			
GDP asymmetry (max/sum)	2.631 (8.29)	68.302*** (17.093)	359.11 (310.322)
GDPpc asymmetry (max/sum)	-7.187 (9.925)	-57.034*** (14.863)	-77.382 (524.894)
GDP asymmetry * substantial tariff cuts	1.667 (1.736)	-29.033. (15.034)	-435.832. (250.831)
GDPpc asymmetry * substantial tariff cuts	-1.643 (1.985)	17.826 (11.206)	110.53 (81.106)
GDP asymmetry * ln FDI	0.206 (0.249)	-1.518*** (0.327)	-40.53 (29.168)
GDPpc asymmetry * ln FDI	-0.086 (0.28)	1.416*** (0.376)	15.606 (17.447)
GDP asymmetry * lnofficial development assistance and official aid received	-0.395 (0.328)	-0.085 (0.302)	52.498 (52.537)
GDPpc asymmetry * lnofficial development assistance and official aid received	0.497 (0.413)	0.164 (0.382)	-24.755 (47.208)
GDP asymmetry * (DAC aid received by PTA members/ DAC aid received)	-20.958** (6.981)	-15.467* (6.121)	86.229 (141.219)
GDPpc asymmetry * (DAC aid received by PTA members/ DAC aid received)	18.437** (6.885)	20.69** (6.944)	144.993 (153.424)
Political Pressure			
PTA members on Special 301 Reports (sum)	-0.092** (0.033)	-0.02 (0.028)	2.149 (1.45)
Veto Players			
Veto players (sum)	0.121** (0.044)	0.032 (0.035)	-2.897 (1.881)

Endogeneity			
PTA depth	0.386*** (0.077)	–	–
Substantial tariff cuts (dummy)	–	11.235** (4.187)	236.081. (133.524)
Regime Preference			
Index IPR multilateral coherence (sum)	0.018*** (0.004)	0.019*** (0.004)	-0.871 (0.536)
Control Variables			
Democratisation (Polity 2) (mean)	0.016 (0.031)	0.022 (0.028)	-0.506 (0.768)
Classic IP leaders	1.203*** (0.336)	1.79*** (0.317)	43.478. (24.932)
Countries with a high increase of patent protection	0.357 (0.26)	-0.248 (0.29)	-13.446 (9.437)
New IP producers and developers	-0.657* (0.285)	0.426 (0.263)	23.036 (16.636)
ln GDP (mean)	-0.073 (0.147)	0.23 (0.145)	3.552 (5.301)
ln GDPpc (mean)	0.118 (0.17)	-0.275 (0.176)	0.811 (5.692)
ln Geographic distance (mean)	0.321* (0.154)	0.312* (0.152)	-12.956 (8.069)
Intercept	–	-17.496** (5.712)	-235.844 (171.591)
log(theta)	–	1.453*** (0.327)	–
Model	m6epa1_op	m6epa2_zinb	m6epa2_zinb
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	392	392	392

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Domestic interests are illustrated in the following regression table and represented by 23 variables out of which eleven have a significant effect on the index IPR specific. However, most significant domestic interests variables show a very low estimate.

On the one hand, the expected change in log(index IPR specific) for a one-unit increase in the resident applications for patents (log) is *-0.878* holding all other variables constant. Thus, instead of patent holders representing their interest and pushing for more specific protection in PTAs, an increase of patent applications by residents has a negative effect on the number of specific IPR provisions in PTAs. On the other hand, the effect for resident applications for trademarks (log) and industrial designs are both positive (*0.56*; *0.47*). For these two IPR forms, the residents are thus more likely to represent their interest in PTAs. Besides the application rates per year, the cumulative rates give an insight into the development over time. Here, the effects are inverted, and the cumulative applications by residents for patents show a significantly positive effect (*0.813*) and a negative one for trademarks (-*0.424*) and industrial designs (-*0.392*).

Table 36: Design Regression – Index IPR Specific (sum) ~ Domestic Interests

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests			
ln Charges for the use of IP, receipts (sum)	-0.017 (0.025)	-0.008 (0.021)	0.025 (0.037)
ln Resident applications for patents (sum)	-0.212 (0.166)	-0.878*** (0.25)	-0.096 (0.37)
ln Resident applications for trademarks (sum)	0.56* (0.22)	0.115 (0.121)	-0.718 (0.483)
ln Resident applications for industrial design (sum)	-0.15 (0.143)	0.47* (0.204)	0.415 (0.285)
ln Resident applications for patents (cumulative, sum)	-0.171 (0.191)	0.813** (0.262)	0.794* (0.382)
ln Resident applications for trademarks (cumulative, sum)	-0.032 (0.216)	-0.424* (0.191)	-0.221 (0.42)
ln Resident applications for industrial design (cumulative, sum)	0.07 (0.187)	-0.392. (0.207)	-0.491 (0.323)
Applications for patents by PTA members / total applications for patents	0.712. (0.422)	-0.181 (0.209)	-1.664. (0.977)
Applications for trademarks by PTA members / total applications for trademarks	-0.434 (0.318)	-0.403* (0.176)	0.6 (0.837)
Applications for industrial designs by PTA members / total applications for industrial designs	-0.253 (0.268)	0.066 (0.15)	0.142 (0.688)
Applications for patents by PTA members / total applications for patents (cumulative)	-61.338 (84.059)	-97.71. (57.54)	-24.445 (139.492)
Applications for trademarks by PTA members / total applications for trademarks (cumulative)	-8.637. (5.118)	1.33 (3.612)	11.77 (8.543)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	4.506 (4.789)	0.945 (3.651)	-0.439 (9.425)
Number of researchers in R&D (sum)	-0.048 (0.041)	-0.03 (0.033)	0.03 (0.061)
R&D expenditure (sum)	0.038 (0.144)	0.111 (0.108)	-0.043 (0.224)
Imports of htp by PTA members (sum)	-0.02 (0.065)	-0.001 (0.034)	0.118 (0.107)
Imports of mhtp by PTA members (sum)	0.121 (0.079)	-0.058 (0.048)	-0.294* (0.125)
Imports of mltp by PTA members (sum)	-0.015 (0.077)	0.066 (0.045)	0.048 (0.117)
Imports of ltp by PTA members (sum)	-0.017 (0.031)	0.01 (0.014)	0.08 (0.072)

Imports of htp by PTA members / total htp imports	0.542 (8.134)	-2.561 (4.629)	-19.606 (13.238)
Imports of mhtp by PTA members / total mhtp imports	-10.277 (6.456)	4.274 (4.439)	13.837 (11.883)
Imports of mltp by PTA members / total mltp imports	29.512 (32.403)	19.4 (23.95)	34.866 (61.715)
Imports of ltp by PTA members / total ltp imports	0.358 (25.263)	-25 (20.12)	-23.816 (39.875)
Political Pressure			
PTA members on Special 301 Reports (sum)	-0.069. (0.04)	-0.018 (0.027)	0.097 (0.071)
Veto Players			
Veto players (sum)	0.119* (0.058)	0.144*** (0.039)	-0.079 (0.136)
Endogeneity			
PTA depth	0.318*** (0.07)	-0.011 (0.048)	-0.569*** (0.141)
Regime Preference			
Index IPR multilateral coherence (sum)	0.029*** (0.004)	0.013*** (0.002)	-0.036*** (0.008)
Control Variables			
Democratisation (Polity 2) (mean)	-0.015 (0.027)	-0.017 (0.016)	-0.01 (0.047)
Classic IP leaders	1.769*** (0.351)	0.226 (0.215)	-2.292** (0.705)
Countries with a high increase of patent protection	0.021 (0.245)	-0.144 (0.168)	-0.477 (0.404)
New IP producers and developers	0.264 (0.236)	0.163 (0.136)	-0.129 (0.379)
ln GDP (mean)	0.262* (0.128)	0.398*** (0.1)	0.246 (0.246)
ln GDPpc (mean)	0.227 (0.146)	-0.015 (0.103)	-0.492. (0.251)
ln Geographic distance (mean)	0.138 (0.112)	0.027 (0.064)	-0.043 (0.175)
Intercept	–	-5.954** (2.247)	6.517 (5.185)
Model	m6di1_op	m6di1_zip	m6di1_zip
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The share of applications for patents by PTA members on the total share of applications have a positive effect on the index IPR specific scope (*0.712*). This means that the stronger the interests of PTA members are in the patent market of their PTA members, the more likely the PTA also contains specific IPR provisions. Yet the same effect for trademarks is significantly negative (*-0.403*), meaning that if PTA members hold a large share of the total trademarks applications in a PTA member market, then the PTA is less likely to include specific IPR.

The cumulative measure for both of these significant effects shows for both patents as well as trademarks significantly negative effects (*-97.71*; *-8.637*). Thus, if the PTA members already hold a substantial share of IPRs on patents or trademarks in one of the other PTA member markets, then their interest in protecting IPR by specific commitments in PTAs decreases significantly.

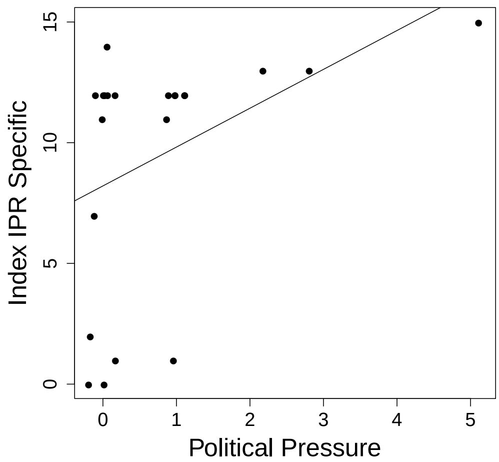
Neither the number of researchers nor the R&D expenditure of countries have a significant effect on specific IPR. Moreover, out of the import measures differentiated by their technology-intensiveness, only the *mhtp* show a significant effect, yet only for the zero stage of the ZIP *di* model. The log odds of the PTA being in the excessive zero group decreases by *-0.294* for every additional one-unit increase in the imports of *mhtp* by PTA members. This means that with an increase of *mhtp* imports by PTA members, the PTAs are more likely to be in the group containing specific IPR provisions.

Political pressure has a significantly negative effect on stringent IPR provisions. The most distinct and significant estimate can be found in the model for general path dependency (*pdg*; *-0.121*). However, the effect is not significant for all models, especially the path dependency models (*pdwss*, *pdwstp*, *pdwfs*, *pdwftp*). The negative effect is contrary to the theoretical argument, which assumes that political pressure by the US on at least one of the PTA members has a positive effect on stringent IPR provisions in PTAs.

As the variable represents the political pressure exerted by the US, I checked for all dependent variables, how the effects are for the subset of US PTAs. Because the US is only part of 23 PTAs, a regression analysis will not yield reliable results for the subsample of US PTAs. Moreover, one of these PTAs – the Canada US Automotive Products Trade Agreement (APTA) – was signed before 1977 and is, therefore, not included in the analysis (see *4.2 Design: Data*). The subsequent analysis thus includes a total of 22 US PTAs. Indeed, when looking at the agreements by the US, the picture is in reverse, and political pressure does have a positive effect on the index IPR specific. The relation is displayed in *Graph 18*, which shows the jittered scatter plot of the regression *Index IPR Specific ~ Political Pressure* for the US PTAs.

To see the PTA distribution more distinctly, I use a jitter plot, which adds some random noise that makes those PTAs with identical scores identifiable. Besides the scores, the plot also includes the regression line and shows a positive relationship between political pressure and the index IPR specific. The higher the score on political pressure, the more PTA members are mentioned in the “Special 301 Reports” (see *4.2.2.2 Data for Political Pressure*).

Graph 18: Jittered Scatter Plot: Index IPR Specific ~ Political Pressure (US PTAs)



The plot shows that the when the US signs a PTA with countries on their “Special 301 Reports”, these PTAs almost exclusively score above ten on the index IPR specific (for values per PTA see *Appendix 23: List of US PTAs: Stringent IPR Indexes & Political Pressure I*). This means that for the US PTAs, the political pressure asserted by the US has a positive effect on the stringent IPR content of the PTAs.

Veto players have a significantly positive effect on stringent IPRs for the model including economic power asymmetry and domestic interest, whereby the higher estimate is found in the economic power asymmetry model (*0.121*). The effect is not significant for most of the path dependency models, namely the *pdg*, *pds*, *pdtp*, *pdwss*, *pdwstp*, and *pdwfs* models. Moreover, the effect is significantly negative for the path dependency model *pdwftp* (*-0.059*). The effects are thus not identical for the tested models, and only significant for one-third of the models, whereby a majority of these suggest that the more veto players are involved amongst PTA members, the more specific IPR provisions are included in their PTA. The theoretical assumptions would suggest the effect is negative for all models. Thus, the results go against the hypothesis. The other dependent variables will show if the effect remains ambiguous and mostly contrarily to the postulated hypothesis or not.

Endogeneity shows a significantly positive effect for the index IPR specific. I only display those models with the best fit for the dependent variable, i.e. either they include

PTA depth or *PTA depth substantial tariff cuts* and or *the index IPR enforcement* or the *index IPR specific enforcement* (see *Figure 12: Design Model Specifications IIb*). The regression tables show that the effect on the specific IPR provisions of PTA depth is significantly positive (*0.386*), and the effect is even higher for substantial tariff cuts (*11.235*). This means that if the PTA includes substantial tariff cuts (binary variable), the PTA is much more likely to include specific IPR provisions. The effect of PTA depth is much lower, indicating that a large part of it might be attributable to substantial tariff cuts.

Regime preference has a significantly positive effect on the index IPR specific, where the most distinct estimate is found in the model for domestic interests (*0.029*). This means that the odds ratio of specific IPR commitments in the PTA increases the more resp. the more binding IPR multilateral coherence provisions are included. But the effect is not significant for some of the path dependency models, namely *pdwss*, *pdwstp* and *pdwftp*. Moreover, the estimates are even for the most pronounced effects only marginal.

Path dependency has a significant effect on the index IPR specific, and I highlight only the significant and most distinct ones.

For the *pdg* model, the most pronounced effects can be observed for industrial designs (*1.148*) and patents (-*1.206*). This means that is one of the PTA members already mentioned industrial design in their previous PTAs and has continued this policy, their PTA is more likely to include specific IPR provisions, whereas the effect is inverted for patents. For the *pds* and the *pdtp* models, the effects are significant, yet on a very low scale. However, for path dependency worldwide, the effects are the more pronounced. For the *pdwss* model, all of the elven tangible IPR forms, as well as the enforcement path dependency variables, show a significantly positive effect on the index IPR specific. This means that if there already exists another PTA signed with tangible commitments or specific IPR enforcement provisions, and these provisions are also included in the PTA, then the index IPR specific is increased. This was to be expected, as the index IPR specific covers the tangible commitments on the IPR forms and the specific IPR enforcement. However, the effect is not significant for path dependency from exhaustion measures. The effect shows more variation for the path dependency from TRIPS-plus provisions in *Table 37*. As the *pdwstp* model illustrates, the path dependency for industrial designs (*2.623*), patents (*0.965*), undisclosed information (*1.13*) and new plant varieties (*1.338*) are the most distinct ones. This means PTAs repeating TRIPS-plus provisions on industrial designs, patents, undisclosed information and new plant varieties already included in other PTAs, are more likely to include specific IPR provisions.

For the *pdwfs* and the *pdwftp* models, the effects are as to be expected almost identical to the one of the *pdwss* resp. the *pdwstp* models, showing slightly lower estimates for the significant effects of the *pdwftp* than the *pdwstp* model.

Table 37: Design Regression – Index IPR Specific (sum) ~ Path Dependency (world, signature, TRIPS-plus)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	-0.04 (0.03)	-0.02 (0.019)	-0.043 (0.07)
Veto Players			
Veto players (sum)	-0.038 (0.03)	-0.012 (0.011)	-0.007 (0.081)
Endogeneity			
PTA depth	0.307*** (0.071)	0.042 (0.041)	0.422*** (0.12)
Regime Preference			
Index IPR multilateral coherence (sum)	0.004 (0.005)	0.001 (0.002)	0.002 (0.01)
Path Dependency			
Indexes based on binary TRIPS-plus categories pdw s – copyrights	-0.79 (0.735)	0.03 (0.235)	-4.076 (707.8)
Indexes based on binary TRIPS-plus categories pdw s – geographical indications	0.293 (0.506)	0.02 (0.183)	0.502 (3734)
Indexes based on binary TRIPS-plus categories pdw s – industrial designs	2.623*** (0.378)	1.293*** (0.344)	9.221 (2926)
Indexes based on binary TRIPS-plus categories pdw s – patents	0.965** (0.371)	0.187 (0.139)	1.539 (3588)
Indexes based on binary TRIPS-plus categories pdw s – undisclosed information	1.13** (0.407)	0.526*** (0.159)	-1.984 (3977)
Indexes based on binary TRIPS-plus categories pdw s – layout-designs of integrated circuits	-0.257 (0.277)	0 (0.115)	-1.202 (2862)
Indexes based on binary TRIPS-plus categories pdw s – new plant varieties	1.338*** (0.336)	0.362** (0.12)	0.548 (1575)
Indexes based on binary TRIPS-plus categories pdw s – traditional knowledge & genetic resources	0.234 (0.387)	-0.014 (0.142)	0.766 (3233)
Indexes based on binary TRIPS-plus categories pdw s – encrypted program-carrying satellite signals	0.671. (0.381)	-0.104 (0.143)	0.66 (3920)
Indexes based on binary TRIPS-plus categories pdw s – domain names	-0.165 (0.904)	-0.214 (0.295)	-0.629 (6240)
Indexes based on binary TRIPS-plus categories pdw s – enforcement	0.239 (0.305)	0.117 (0.125)	-0.576 (1743)
Indexes based on binary TRIPS-plus categories pdw s – exhaustion	0.214 (0.331)	0.096 (0.126)	-0.842 (2232)

Control Variables			
Democratisation (Polity 2) (mean)	0.017 (0.028)	0.012 (0.016)	0.021 (0.039)
Classic IP leaders	1.233*** (0.308)	0.459*** (0.128)	0.082 (0.66)
Countries with a high increase of patent protection	0.141 (0.275)	-0.051 (0.142)	0.486 (0.397)
New IP producers and developers	0.03 (0.229)	0.034 (0.104)	-0.039 (0.371)
ln GDP (mean)	0.068 (0.099)	0.066 (0.052)	-0.189 (0.165)
ln GDPpc (mean)	-0.12 (0.14)	-0.122. (0.073)	0.249 (0.248)
ln Geographic distance (mean)	0.381** (0.121)	0.027 (0.061)	0.48* (0.209)
Intercept	–	-1.157 (1.342)	-4.22 (3.042)
Model	m6pdwstp1_op	m6pdwstp1_hp	m6pdwstp1_hp
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Control variables have a significant effect on the index IPR specific. The classic IP leaders – US, EU, EFTA and Japan – have a significantly positive effect on the specific IPR content of PTAs (*1.769*). However, the ZINB *epa* model shows a significantly positive effect of the classic IP leaders for the count data (*1.79*), which would still lead to a similar conclusion, yet also for the zero data (*43.478*). This means that amongst those PTAs that might include specific IPR provisions, classic IPR leaders have a positive effect on the number of provisions (count data effect). But classic IPR leaders have a highly more pronounced positive impact on the fact that PTAs fall into the excessive zero category and will not include any specific IPR provisions (zero data effect). Further, for the ZIP *di* model, the effect is inverted and significantly negative for the zero stage (-*2.292*). The effect of classic IPR leaders has to be interpreted prudently.

The average GDP (log) has a significantly positive effect (*0.262*), whereas the average GDP per capita (log) shows a significantly negative effect for count data of the HP *pdg* model (-*0.171*). This indicates that a higher average GDP amongst PTA members has a positive effect, and an increased GDP per capita has a negative effect on the amount of specific IPR provisions in a PTA. For the average geographic distance (log) the effect is also significantly positive (*0.381*), meaning that the further away PTA members are from one another, the more specific IPR provisions are in the PTA.

The other path dependency regression models are included in *Appendix 29: Design Regression – Index IPR Specific (sum) ~ Path Dependency (general), Appendix 30: Design Regression – Index IPR Specific (sum) ~ Path Dependency (specific), Appendix 31: Design Regression – Index IPR Specific (sum) ~ Path Dependency (TRIPS-plus), Appendix 32: Design Regression – Index IPR Specific (sum) ~ Path Dependency (world, signature, specific), Appendix 33: Design Regression – Index IPR Specific (sum) ~ Path Dependency (world, force, specific),* and *Appendix 34: Design Regression – Index IPR Specific (sum) ~ Path Dependency (world, force, TRIPS-plus).*

4.3.2.2 Index IPR Scope Tangible (sum)

Table 38 display the model for domestic interests and *Table 39* the model for path dependency world by from TRIPS-plus provisions after the entry into force of PTAs (*pdwftp*) for the regression analysis of the index IPR scope tangible, i.e. the additive index of the tangible provisions on the eleven forms of IPR found in PTAs.

Economic power asymmetry has no significant effects on the index IPR scope tangible. The number of specific IPR forms covered by a PTA is thus not affected by economic power asymmetry measures. The regression table for economic power asymmetry is displayed in *Appendix 35: Design Regression – Index IPR Scope Tangible (sum) ~ Economic Power Asymmetry*.

Domestic interests do have a significant effect, yet only due to three out of the 23 domestic interest measures. Firstly, the zero data of the HP *di* model shows a significantly negative effect of the cumulative share of applications for trademarks by PTA members of the total applications for trademarks (-*39.567*). This means that the more of the total trademark applications are made by PTA members, the fewer tangible IPR provisions are included in the PTA. The estimate shows the most pronounced significant effect on the index, indicating that for the number of specific IPR forms in PTAs domestic interests have a mostly negative effect.

Secondly, the zero data of the HP *di* model suggests a significantly positive effect of the imports of *mhtp* by PTA members (*0.614*). This shows that with an increase of the medium-high-technology product imports by PTA members, the PTA is more likely to include tangible IPR provisions. However, this effect is much less distinct than the first significant one.

Thirdly, the count data of the HP *di* model shows a significantly negative effect of the share of imports of *htp* by PTA members on the total *htp* imports (*-12.28*). This means that those PTAs which include tangible provisions are less likely to tangibly cover multiple forms of IPRs the higher the *htp* share of PTA members.

Table 38: Design Regression – Index IPR Scope Tangible (sum) ~ Domestic Interests

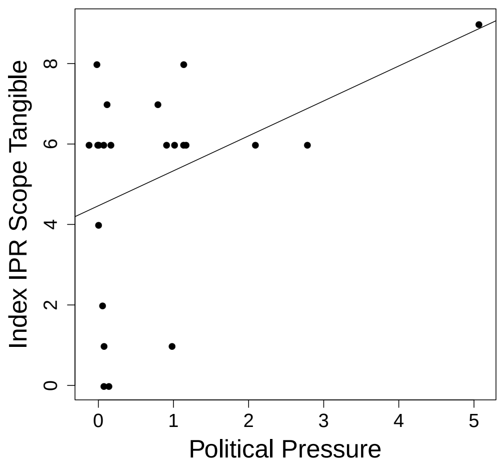
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests			
ln Charges for the use of IP, receipts (sum)	-0.019 (0.028)	-0.001 (0.034)	-0.15 (0.109)
ln Resident applications for patents (sum)	-0.215 (0.194)	-0.222 (0.467)	0.21 (1.292)
ln Resident applications for trademarks (sum)	0.251 (0.209)	0.018 (0.175)	0.673 (1.376)
ln Resident applications for industrial design (sum)	-0.168 (0.158)	-0.115 (0.39)	-0.851 (0.578)
ln Resident applications for patents (cumulative, sum)	-0.311 (0.237)	-0.025 (0.478)	-1.261 (1.244)
ln Resident applications for trademarks (cumulative, sum)	0.188 (0.242)	-0.453 (0.32)	2.173 (1.349)
ln Resident applications for industrial design (cumulative, sum)	0.084 (0.196)	0.213 (0.381)	0.042 (0.743)
Applications for patents by PTA members / total applications for patents	-0.391 (0.421)	-0.182 (0.301)	-0.527 (2.621)
Applications for trademarks by PTA members / total applications for trademarks	0.536 (0.351)	-0.234 (0.286)	1.436 (2.202)
Applications for industrial designs by PTA members / total applications for industrial designs	0.007 (0.289)	0.25 (0.219)	-0.203 (1.375)
Applications for patents by PTA members / total applications for patents (cumulative)	39.939 (91.929)	-51.29 (94.94)	483.129 (402.809)
Applications for trademarks by PTA members / total applications for trademarks (cumulative)	-7.619 (5.719)	2.04 (5.212)	-39.576. (23.324)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	0.481 (5.376)	-1.637 (5.419)	5.561 (19.254)
Number of researchers in R&D (sum)	-0.043 (0.048)	0.038 (0.05)	-0.088 (0.205)
R&D expenditure (sum)	0.053 (0.157)	0.065 (0.147)	0.105 (0.667)
Imports of htp by PTA members (sum)	0.004 (0.072)	0.023 (0.054)	-0.234 (0.297)
Imports of mhtp by PTA members (sum)	0.034 (0.089)	-0.007 (0.078)	0.614. (0.359)

Imports of mltp by PTA members (sum)	0.041 (0.09)	0.015 (0.068)	-0.294 (0.348)
Imports of ltp by PTA members (sum)	-0.018 (0.032)	-0.004 (0.022)	-0.116 (0.146)
Imports of htp by PTA members / total htp imports	-11.537 (9.111)	-12.28. (7.4)	31.545 (31.122)
Imports of mhtp by PTA members / total mhtp imports	-3.543 (7.983)	1.515 (7.372)	-54.405 (33.886)
Imports of mltp by PTA members / total mltp imports	42.907 (38.044)	40.89 (37.84)	-25.59 (182)
Imports of ltp by PTA members / total ltp imports	-16.678 (29.705)	-30.04 (32.23)	116.409 (124.52)
Political Pressure			
PTA members on Special 301 Reports (sum)	0.063 (0.047)	0.07. (0.036)	-0.061 (0.192)
Veto Players			
Veto players (sum)	-0.072 (0.072)	0.083 (0.066)	-0.179 (0.536)
Endogeneity			
PTA depth	0.353*** (0.08)	–	–
Substantial tariff cuts (dummy)	–	-0.437 (0.432)	2.112 (1.496)
Index IPR specific enforcement (sum)	0.707*** (0.077)	0.238*** (0.053)	1.738*** (0.355)
Regime Preference			
Index IPR multilateral coherence (sum)	0.009. (0.005)	0.006 (0.004)	0.081*** (0.024)
Control Variables			
Democratisation (Polity 2) (mean)	-0.019 (0.029)	-0.034 (0.025)	0.258. (0.151)
Classic IP leaders	1.245** (0.396)	0.325 (0.342)	2.85. (1.731)
Countries with a high increase of patent protection	0.29 (0.291)	0.169 (0.252)	-0.329 (1.271)
New IP producers and developers	0.021 (0.284)	0.08 (0.21)	1.378 (1.065)
ln GDP (mean)	0.282. (0.157)	0.495** (0.189)	-0.327 (0.83)
ln GDPpc (mean)	0.173 (0.166)	-0.079 (0.159)	1.78* (0.822)
ln Geographic distance (mean)	0.288* (0.131)	-0.072 (0.103)	0.955 (0.619)
Intercept	–	-5.059 (3.886)	-39.078* (19.688)
Model	m7di3_op	m7di4_hp	m7di4_hp
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Political pressure has a significantly positive effect on the index IPR scope tangible. For example, the effect is positive for the count data of the *epa* model (*0.071*) indicating that amongst those that do include tangible commitments on IPR scope, there is a positive effect of political pressure. This means that if PTAs with members on the "Special 301 Reports" do include tangible provisions, they tend to include them on multiple IPR forms. This effect is again tested for the subset of US PTAs and plotted in *Graph 19***:**

Graph 19: Jittered Scatter Plot: Index IPR Scope Tangible ~ Political Pressure (US PTAs)



The plot shows that those PTAs that include members on the "Special 301 Reports" score always score positively on the index IPR scope tangible, i.e. that PTAs with members under political pressure by the US always include tangible IPR provisions, mostly on six IPR forms or more (for values per PTA see *Appendix 23: List of US PTAs: Stringent IPR Indexes & Political Pressure I*).

Veto players have a significantly negative effect on the index IPR tangible scope. In the economic power asymmetry hurdle model, the count data shows that out of those PTAs that include tangible IPR provisions, the veto players have a negative effect on how many IPR forms are covered (*-0.085*). However, veto players have no significant effect in the other eight regression models for the index IPR tangible scope.

Endogeneity has a significantly positive effect on the index IPR scope tangible. The two most distinct estimates are found for PTA depth (*0.497*) and index IPR specific enforcement (*0.707*). This means that the deeper the PTA resp. the more specific IPR enforcement provisions are included in the PTA, the more tangible IPR scope commitments can be found in the PTA.

Regime preference has a significantly positive effect on the index IPR scope tangible, and the most distinct effect can be found in the *epa* and *di* model (*0.009*). Additionally, the zero stage of the HP model also shows a highly significant effect of regime preference (*0.081*). This means that PTAs including IPR multilateral provisions are more likely to also include tangible IPR scope provisions. However, the effect is not significant for the path dependency models *pdwstp*, *pdwfs* and *pdwftp*.

Path dependency has a significant effect on the tangible IPR provisions. The *pdg* model shows the most distinct significant effects for industrial designs (*2.237*) as well as patents (-*2.374*). This means that if PTA members repeat general provisions on industrial design in their PTAs, their PTAs are also more likely to include specific IPR provisions. The effect is inverted for general patent commitments, which lead to a decrease of specific IPR commitments in PTAs. Again, the *pds* and *pdtp* model only show significant effects on a very low impact level. Unsurprisingly, the *pdwss* and *pdwfs* models show a significantly positive effect of path dependency of *1* for all eleven forms of IPR as the index tangible scope captures the additive commitments to the tangible IPR forms.

For the *pdwstp* model, the most pronounced effects are all significantly positive and are found for path dependency from TRIPS-plus provisions on industrial designs (*2.752*), undisclosed information (*1.588*), domain names (*1.721*) and exhaustion (*1.307*). Thus, if a PTA repeats provisions on these TRIPS-plus areas already covered in another agreement worldwide then the PTA is more likely to cover more IPR forms in a tangible manner. The *pdwftp* model is displayed in *Table 39* and shows highly similar effects on the index IPR tangible scope as the *pdwstp* model with more distinct estimates in the *pdwftp* model. This means that the path dependency effect of TRIPS-plus provisions for the tangible scope has more impact once a PTA has entered into force.

Table 39: Design Regression – Index IPR Scope Tangible (sum) ~ Path Dependency (world, force, TRIPS-plus)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	0.097* (0.038)	0.048. (0.026)	0.417 (0.495)
Veto Players			
Veto players (sum)	-0.069. (0.037)	-0.025 (0.018)	-0.5 (0.718)
Endogeneity			
PTA depth	0.268** (0.092)	0.119. (0.067)	0.34 (0.258)
Index IPR specific enforcement (sum)	0.359*** (0.098)	0.172** (0.061)	0.086 (0.401)
Regime Preference			
Index IPR multilateral coherence (sum)	-0.008 (0.006)	-0.004 (0.004)	0.006 (0.022)
Path Dependency			
Indexes based on binary TRIPS-plus categories pdw f – copyrights	-0.109 (0.792)	0.178 (0.352)	-3.373 (2248)
Indexes based on binary TRIPS-plus categories pdw f – geographical indications	0.064 (0.601)	-0.252 (0.313)	7.602 (3629)
Indexes based on binary TRIPS-plus categories pdw f – industrial designs	2.835*** (0.391)	0.733 (0.713)	5.184* (2.062)
Indexes based on binary TRIPS-plus categories pdw f – patents	-0.247 (0.428)	-0.023 (0.242)	2.896 (8345)
Indexes based on binary TRIPS-plus categories pdw f – undisclosed information	1.668*** (0.457)	0.551* (0.229)	2.059 (7220)
Indexes based on binary TRIPS-plus categories pdw f – new plant varieties	0.8* (0.4)	0.173 (0.204)	11.56 (1798)
Indexes based on binary TRIPS-plus categories pdw f – traditional knowledge & genetic resources	-0.312 (0.412)	-0.11 (0.226)	0.881 (18540)
Indexes based on binary TRIPS-plus categories pdw f – encrypted program-carrying satellite signals	0.979* (0.4)	0.054 (0.204)	1.741 (18640)
Indexes based on binary TRIPS-plus categories pdw f – domain names	2.264* (1.107)	0.304 (0.411)	-15.8 (19860)
Indexes based on binary TRIPS-plus categories pdw f – enforcement	0.33 (0.331)	0.24 (0.2)	3.516 (3235)
Indexes based on binary TRIPS-plus categories pdw f – exhaustion	1.502*** (0.403)	0.404* (0.201)	-0.95 (4235)
Control Variables			
Democratisation (Polity 2) (mean)	0.033 (0.038)	0 (0.024)	0.188 (0.155)
Classic IP leaders	0.314 (0.402)	0.035 (0.277)	1.526 (1.378)
Countries with a high increase of patent protection	-0.436 (0.353)	-0.196 (0.234)	0.124 (0.846)

New IP producers and developers	-0.429 (0.295)	-0.159 (0.173)	0.338 (0.831)
ln GDP (mean)	0.203 (0.132)	0.041 (0.078)	-0.434 (0.423)
ln GDPpc (mean)	-0.139 (0.176)	-0.097 (0.099)	0.044 (0.653)
ln Geographic distance (mean)	0.385** (0.149)	-0.021 (0.099)	1.969** (0.65)
Intercept	–	-1.043 (2.195)	-10.79 (10.16)
Model	m7pdwftp3 _op	m7pdwftp3 _hp	m7pdwftp3 _hp
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	484	484	484

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Control variables show significant inconsistent effects on the index IPR scope tangible that vary across models. The effects found in almost all models are a significantly positive effect for classic IP leaders and geographical distance. Classic IP leaders – US, EU, EFTA and Japan – have a positive effect (*1.245*), which is even more distinct for the zero stage of the HP *di* model (*2.85*). For the average geographic distance (log) the picture is similar with a positive effect for the OP model (*0.685*) and even more so for the zero data of the HP *epa* model (*1.951*). This means that if one or more of the classic IP leaders are PTA members resp. the more distance lies between PTA members, the more tangible IPR commitments are included in the PTA. The other country blocks also show significant results for some of the models, whereby the countries with a high increase of patent protection – Brazil, China, India and Mexico – are more likely to include more tangible IPR provisions in their PTAs (*0.568*), and the new IP producers and developers – Israel, South Korea, Singapore and Taiwan – tend to include less stringent provisions (*-0.8*). For the average democratisation, the effect is also positive, yet only for the zero data of the HP *di* model (*0.258*).

The directions of the effects on tangible IPR scope provisions are ambiguous for the GDP control variables. The average GDP (log) has a significantly negative effect in the *epa* model (*-0.289*) and the effect is even more distinct for the zero stage of the HP *epa* model (*-0.789*), whereas the *di* model suggests the opposite effect (*0.282*), which is even more pronounced for the count data of the HP *di* model (*0.495*). On the other hand, the average GDP per capita (log) shows a positive effect for the OP *epa* model (*0.354*) and for the zero data of the HP *di* model (*1.78*), yet a negative effect for the count data of the

HP *pdg* model (*-0.283*). This means that GDP and GDP per capita can have both positive or negative effects and might not be the most reliable predictors for the scope of tangible IPR commitments in PTAs.

The regression tables for the other path dependency variables are included in *Appendix 36: Design Regression – Index IPR Scope Tangible (sum) ~ Path Dependency (general)*, *Appendix 37: Design Regression – Index IPR Scope Tangible (sum) ~ Path Dependency (specific)*, *Appendix 38: Design Regression – Index IPR Scope Tangible (sum) ~ Path Dependency (TRIPS-plus)*, *Appendix 39: Design Regression – Index IPR Scope Tangible (sum) ~ Path Dependency (world, signature, specific)*, *Appendix 40: Design Regression – Index IPR Scope Tangible (sum) ~ Path Dependency (world, signature, TRIPS-plus)*, and *Appendix 41: Design Regression – Index IPR Scope Tangible (sum) ~ Path Dependency (world, force, specific)*.

4.3.2.3 Binary Variables for IPR Scope Tangible

The index IPR scope tangible is the additive index on the binary coding of the eleven forms of IPRs found in PTAs. In order to allocate a particular form of IPR drives the results for the index, I analyse the effect for each form in a separate model. The regression tables are not displayed in this subchapter, but can be found in *Appendix 21: Design Regression Tables of the Binary Variables for IPR Scope* Tangible.

Economic power asymmetry only has a significant effect on the tangible commitments of a couple of IPR forms, namely industrial design, layout-designs of integrated circuits, TK & GR, encrypted program-carrying satellite signals and domain names. As there are only a few significant effects of the *epa* measures, I describe all of them.

First of all, GDP per capita asymmetry has a significantly positive effect on domain names (*1.238*), which means that PTAs with GDP-wise different PTA partners are more likely to include tangible provisions on domain names. Secondly, the interaction term of GDP asymmetry with substantial tariff cuts is significantly positive for tangible commitments on encrypted program-carrying satellite signals (*0.191*), whereas the same interaction term with GDP per capita is significantly negative for industrial design (*-0.302*) and layout-designs of integrated circuits (*-0.126*). For instance, PTAs that have an increased GDP asymmetry amongst PTA members and contain substantial tariff cuts are more likely to include specific provisions on encrypted program-carrying satellite signals.

Thirdly, the interaction term of GDP asymmetry with FDI (log) has a significantly positive effect on TK & GR (*0.019*) and domain names (*0.016*), where the interaction term of GDP per capita asymmetry and FDI (log) has a significantly negative effect on TK & GR (-*0.027*). This means that when PTA partners have an increased asymmetry between their GDPs and or an increased FDI flow, the PTAs are more likely to include specific provisions on TK & GR as well as domain names. However, the effect is decreased for TK & GR if there is also an increased asymmetry of the living standards amongst PTA members.

Domestic interests have many significant effects on the binary tangible IPR variables. There are too many to describe them all, and I only list the most distinct ones.

The resident applications for patents (log) show a significantly negative effect on the zero data of the HP *di* model for copyrights (-*1.146*). This means that an increase in the resident patent applications decreases the likelihood of the PTA to be in the excessive zero group regarding tangible IPR commitments. For the resident applications for trademarks (log) the effect is positive for the zero data of the HP *di* model for copyrights (*1.708*), which means that with an increase of resident trademarks applications the PTA is more likely to be in the excessive zero group for tangible copyright provisions.

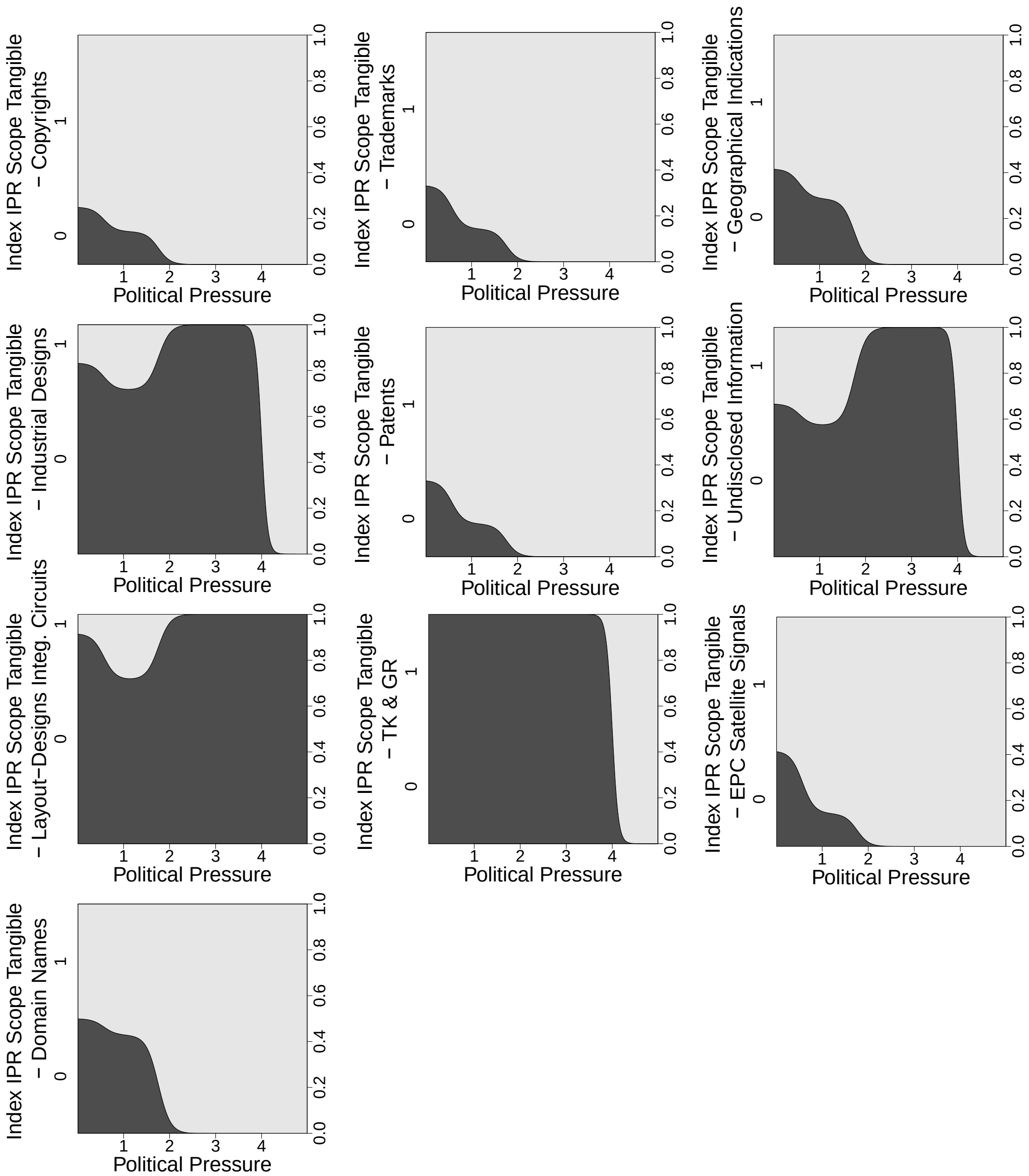
The cumulative share of applications for patents by PTA members on the total applications for patents has a significantly positive effect on tangible IPR provisions for geographical indications (*41.047*) and domain names (*11.13*). This means that the higher the cumulative share of patent applications by PTA members, the more likely the PTA includes specific provisions on geographical indications resp. domain names. The cumulative share of applications for trademarks by PTA members on the total applications for trademarks shows a significantly negative effect for geographical indications (-*1.168*) and more distinctly for the zero data of the HP di model for geographical indications (-*32.76*), as well as a positive effect for the zero data of the HP *di* model for patents (*24.491*). This means that a larger share of trademark applications by PTA members decreases the likelihood of the PTA including specific GI provisions and increases it for tangible patent commitments. The cumulative applications for industrial designs by PTA members on the total applications for industrial designs also have a significantly negative effect for geographical indications (-*1.397*), likewise decreasing the likelihood of the PTA including tangible GI provisions.

The share of imports of *htp* by PTA members on the total *htp* imports shows a significantly negative effect for tangible provision on copyrights (-*1.784*), trademarks (-*1.971*), patents (-*1.638*) and TK & GR (-*1.742*). This means that the more of the overall high-technology products are imported by PTA members, the fewer specific provisions on copyrights, trademarks, patents and TK & GR are included in the PTA. For the share of imports of *mhtp* by PTA members on the total *mhtp* imports the effect is significantly positive for the HP *di* model for tangible copyright provisions (*42.74*) and for the zero data of the HP *di* model for specific geographical indication commitments (-*30.98*). This means that with a higher share of *mhtp* imports by PTA members, PTAs are much more likely to include specific copyright provisions and less likely to be in the excessive zero group for tangible GI provisions. And the share of imports of *mltp* by PTA members on the total *mltp* imports has a significantly positive effect on tangible provisions on encrypted program-carrying satellite signals (*6.069*) and domain names (*4.274*). This means that if the share of *mltp* imports by PTA members increases, the PTA is more likely to include tangible commitments on encrypted program-carrying satellite signals and domain names.

Political pressure has significantly positive as well as negative effects on the different IPR forms. The highest significant estimates show positive effects for copyrights (*0.009*), trademarks (*0.015*), undisclosed information (*0.475*), layout-designs of integrated circuits (*0.475*), new plant varieties (*0.014*), TK & GR (*0.008*), encrypted program-carrying satellite signals (*0.008*), domain names (*0.007*), and a negative effect only for industrial designs (-*0.018*). This means that where countries mentioned in the "Special 301 Reports" are amongst the PTA members, these PTAs are more likely to include tangible provisions on copyrights, trademarks, undisclosed information, layout-designs of integrated circuits, new plant varieties, TK & GR, encrypted program-carrying satellite signals and domain names. However, for most of these IPR forms the effect is highly minor, and only if multiple PTA members are on the US list (multiple-unit increase on the variable political pressure), the impact becomes relevant. This includes the only significantly negative effect for industrial designs, which suggests that the more countries amongst PTA members are on the US list the less likely tangible provisions on industrial designs are included in the PTA.

To check the effects for the PTAs signed with the US as a member state, I plot each of the eleven forms of IPRs tangible provisions regressed on political pressure in *Graph **20.*** I use conditional density plots as due to the binary nature of the dependent variables, the jittered scatter plots would be less informative. There is no plot for tangible provisions on new plant varieties, as none of the US PTA includes such provisions.

Graph 20: Conditional Density Plots for US PTAs: Binary Variables IPR Scope Tangible & Political Pressure



The lighter area of the plots represent the scores of '*1*' on the dependent variable and the darker area the results of '*0*'. The scale on the right-hand axis indicates the probability of the shaded areas. The higher the dark shaded area, the more likely the DV is equal to zero. The lower the light shaded area is, the more likely is the DV equal to one. For example, the first plot for tangible provisions on copyrights shows that if none of the PTA members are mentioned in the "Special 301 Reports", the chance of the PTA including tangible copyright provisions is approximately 75% resp. 25% for the PTA not including tangible copyright provisions. With one member on the US list, the likelihood of including tangible copyright provision increases to approximately 82%, and if there are two or more countries on the list, it is almost guaranteed that the PTA includes tangible copyright provisions. A similar picture can be observed for trademarks, patents, encrypted program-carrying satellite signals, and on a lower level also for geographical indications and domain names. All of these plots thus show a positive effect of political pressure on the respective tangible IPR provision.

The plots also show that the effects of industrial design and undisclosed information are similar. The probability of including tangible provisions is low for those PTAs without political pressure, increase when one PTA member is on the US list, is zero if there are two or three PTA members on the list and increases rapidly if more than three PTA members are on the US list. The effect for tangible provisions on layout-designs of integrated circuits starts the same, yet remains at zero after at least 2 PTA members are on the US list.

Tangible provisions on traditional knowledge and genetic resources (TK & GR) follow an entirely different pattern and are not included in any of the US PTAs, where there are less than four PTA members mentioned in the "Special 301 Reports". In fact, this is only the case for one PTA, the TPP, which has not entered into force. Thus, none of the US PTAs that was implemented into domestic law includes any tangible provisions on TK & GR nor new plant varieties (for values per PTA see *Appendix 24: List of US PTAs: Stringent IPR Indexes & Political Pressure II* and *Appendix 25: List of US PTAs: Stringent IPR Indexes & Political Pressure III*).

Veto players have both a significantly negative or significantly positive effect on the various forms of tangible IPR provisions. The effects are significantly positive for tangible commitments on copyrights (*0.015*) and geographical indications (*0.01*). Depending on the model, they are significantly positive or negative for industrial design (*0.009*; -*0.013*), new plant varieties (*0.008*; *-0.006*) and traditional knowledge and genetic resources (*0.01*; *-0.004*). The effects are significantly negative for patents (-*0.007*), undisclosed information (-*0.016*), layout-designs of integrated circuits (-*0.008*), encrypted program-carrying satellite signals (-*0.012*) and domain names (-*0.009*). Hereby, the effect is especially pronounced for the zero stage of the layout-designs of integrated circuits hurdle model (-*0.617*), which means that veto players have a significantly negative effect on whether the PTA includes tangible provisions on layout-designs of integrated circuits or not. For all other forms of IPR, the effect is only marginal for an increase of veto players. For trademarks, veto players have no significant effect.

Endogeneity has a significantly positive and negative effect on the tangible IPR commitments. For PTA depth, the most distinct estimate is found for geographical indications (*0.052*). There are also distinct significant effects for the zero stages of various HP models such as copyrights (*0.584*) and geographical indications (*0.602*), meaning that deeper PTAs are more likely to include tangible provisions on these IPR forms. For the measure of substantial tariff cuts, there are significant positive effects, most distinctly for industrial design (*0.241*), and significantly negative effects for encrypted program-carrying satellite signals (*-0.115*) and domain names (*-0.11*). Whilst substantial tariff commitments increase the odds ratio of most tangible IPR commitments, they decrease the likelihood of specific provisions on encrypted program-carrying satellite signals and domain names. The index IPR enforcement also shows a significantly positive effect, that is most pronounced for copyrights (*0.099*). This effect might be attributed to some extent to the index IPR specific enforcement, which also shows highly significant effects on the tangible IPR provisions. The most distinct estimates can be found for patents (*0.149*). This effect is also confirmed by the significantly positive estimates for the zero stages of the HP model for patents (*0.868*), indicating as well that PTAs are more likely to include tangible patent provisions if the PTA also includes specific IPR enforcement commitments. Overall, the endogeneity measures show a mostly positive significant effect on tangible IPR commitments.

Regime preference has either a significantly positive or negative effect on the eleven binary IPR tangible scope variables. The most distinct significantly positive effects are found for copyrights (*0.001*), trademarks (*0.002*), geographical indications (*0.004*) and traditional knowledge and genetic resources (*0.003*), whereas the significantly negative effect are shown for industrial design (*-0.002*), patents (*-0.002*), undisclosed information (*-0.001*), layout-designs of integrated circuits (*-0.001*), encrypted program-carrying satellite signals (*-0.001*) and new plant varieties (*-0.001*). For example, an increase of commitments on IPR multilateral coherence also increases the odds of specific provisions on geographical indications resp. decreases the odds of specific provisions on patents. All of the direction s of the effects are consistent across models, yet not all of them are significant in each model. Further, regime preference has no significant effect on domain names. So, even the significant effects are on a low-impact level, therefore reducing the explanatory power of regime preference for the tangible IPR scope variables.

Path dependency has a significant effect on the binary tangible variables, and I highlight the most distinct and significant effects for the seven path dependency models per IPR form.

There are some significant effect for the *pdg* model, yet on a very low scale and only have a minor impact on the tangible IPR commitments. For the *pds* model, there are many significant effects of various variables on multiple IPR forms. Concretely, path dependency from copyrights has a negative effect on the zero data of the HP *pds* model for copyrights (*-1.127*). This means that PTAs, which repeat copyright variables already included in one of their members previous PTA, are less likely to include tangible copyright measures. This indicates that the path dependency from including the tangible copyright provisions was unfavourable for these provisions, and the path dependency leads to a direct negative effect on tangible copyright provisions. There is an additional negative path dependency from trademarks that has a negative effect on the zero data of the HP *pds* model for copyrights (*-3.044*). Thus, PTAs with PTA members that included tangible trademarks provisions in their previous PTAs and repeat these provisions are also less likely to contain tangible copyright provisions. However, there are also positive effects of path dependency for copyrights: by path dependency from GIs (zero data of the HP *pds* model for copyrights: *0.964*), by layout-designs of integrated circuits (zero data of the HP *pds* model for copyrights: *2.125*) and by encrypted program-carrying satellite signals (zero data of the HP *pds* model for copyrights: *1.786*). This means that for PTAs, where the PTA members included in their previous PTAs tangible provisions on GIs, layout-designs of integrated circuits and or encrypted program-carrying satellite signals, and repeat these commitments, these PTAs are more likely to include tangible provisions on copyrights. Thus, most of the distinct path dependency effects focus on tangible provisions on copyrights.

Further, the regression analysis shows path dependency effects from domain names on tangible provision on undisclosed information (zero data of the HP *pds* model: *-1.199*) and on layout-designs of integrated circuits (zero data of the HP *pds* model: *-1.199*). This suggests that if PTA members included tangible commitments on domain names in their previous PTAs and repeat these commitments, their PTAs are less likely to include specific provisions on undisclosed information and or layout-designs of integrated circuits.

The *pdtp* model shows a path dependency effect from layout-designs of integrated circuits on the zero data of the HP *pdtp* model for copyrights (*5.044*), from encrypted program-carrying satellite signals on the zero data of the HP *pdtp* model also for copyrights (-*3.004*) and from domain names on the zero data of the HP *pdtp* model as well for copyrights (*2.45*). Thus, for PTAs, where the PTA members repeat TRIPS-plus provisions on layout-designs of integrated circuits and or domain names, the PTA is more likely to include tangible copyright provisions. This effect is vice versa for path dependency from TRIPS-plus provisions on encrypted program-carrying satellite signals.

The *pdwss* and *pdwfs* models show as to be expected a highly significant effect of path dependency for each form of IPR with the respective binary IPR variable. This simply shows that the path dependency for the tangible commitments is only coded if that provision is included (again) in a PTA, thus leading to a significantly positive estimate of *1* for all IPR forms. The cross effects from path dependency by other forms are in some cases significant, yet on a highly marginal level (*estimates < 0.000*).

For the *pdwstp* model, path dependency from layout-designs of integrated circuits has a positive effect on the zero data of the HP *pdwstp* model for geographical indications (*3.756*) and path dependency from domain names has a positive effect on layout-designs of integrated circuits (*0.937*). This suggests that where PTAs repeat pre-existing PTA TRIPS-plus provisions on layout-designs of integrated circuits resp. domain names, the PTAs are more likely to include tangible provisions on geographical indications resp. layout-designs of integrated circuits.

The *pdwftp* model shows similar and different effect compared to the *pdwstp* model. For path dependency from new plant varieties, there is a positive effect on industrial designs (*0.804*), and for path dependency from domain names, there is a positive effect on undisclosed information (*0.806*) and on layout-designs of integrated circuits (*0.93*). Moreover, path dependency from exhaustion has a positive effect on TK & GR (*0.791*). This means, for example, that PTAs, which repeat TRIPS-plus exhaustion provisions from PTAs that have already entered into force are more likely to include tangible commitments on traditional knowledge and genetic resources.

Control variables significantly affect the binary variables for IPR scope tangible, and I highlight the most distinct positive and or negative effects per control variable.

Starting off, average democratisation has the most distinct and significant effect on tangible provisions regarding geographical indication (*0.004*) as well as copyrights and trademarks (-*0.004*). The effect is marginal, thus the effect of democratisation is significantly, yet benign.

For the country blocks, the classic IP leaders – US, EU, EFTA and Japan – are the ones that have a significant effect on most IPR forms, whereby the effect is both positive and negative. It is, for example, positive for tangible provisions on patents (*0.261*) and negative for geographical indications (-*0.173*), meaning that PTAs with at least one of the classic IP leaders as member are more likely to include tangible provisions on patents and less likely to include them on geographical indications. For the other country blocks, the effects are also significantly positive and negative, whereby countries with a high increase of patent protection – Brazil, China, India and Mexico – have the most distinct measures on the inclusion of tangible commitments on industrial design (*0.1*) and the exclusion of domain names (-*0.061*). This means that if one or more of these countries are PTA members, the PTA is more likely to contain tangible provisions on industrial design and less likely on domain names. New IP producers and developers – Israel, South Korea, Singapore and Taiwan – have the most pronounced effects for traditional knowledge and genetic resources (*0.093*) and encrypted program-carrying satellite signals (-*0.089*). Thus, if they are part of an agreement, their PTA is more likely to cover tangible provisions on TK & GR and less likely on encrypted program-carrying satellite signals.

Both of the GDP variables affect tangible provisions on copyrights and industrial designs the most, yet to a reversed end. Where the average GDP (log) shows a positive effect for tangible commitments on copyrights (*0.049*) and a negative one for industrial designs (-*0.056*), the average GDP per capita (log) has a positive effect on industrial design (*0.066*) and a negative one on copyrights (-*0.041*). The positive effect for the average GDP (log) is even more pronounced for the zero stage of the HP *di* model (*2.218*). This means that a higher average GDP increases the likelihood of the PTA covering tangible copyright provisions and decreases it for industrial design provisions. And for the average GDP per capita, the effect is vice versa.

The average geographic distance (log) has a positive effect on tangible provisions on geographical indications (*0.057*) and negatively affects commitments on industrial designs (-*0.026*), which is even more distinctly visible for the zero stage of the HP *di* model (-*6.127*). This means that PTA members, which are further apart from one another, are more likely to contain tangible provisions on GIs and less likely ones on industrial designs.

4.3.2.4 Index IPR Specific Enforcement (sum)

For the index IPR specific enforcement, the most distinct effects can be found for economic power asymmetry in *Table 40*, for domestic interests in *Table 41* and path dependency (*pdwftp*) in *Table 42*.

Table 40: Design Regression – Index IPR Specific Enforcement (sum) ~ Economic Power Asymmetry

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Economic Power Asymmetry			
GDP asymmetry (max/sum)	7.586 (9.069)	-14.301 (12.382)	-49.087 (37.881)
GDPpc asymmetry (max/sum)	-15.463 (11.032)	2.436 (14.26)	33.652 (35.303)
GDP asymmetry * substantial tariff cuts	1.899 (2.242)	26.484*** (7.978)	47.883 (39.147)
GDPpc asymmetry * substantial tariff cuts	-1.435 (2.467)	-26.183** (8.162)	-48.226 (38.313)
GDP asymmetry * ln FDI	0.191 (0.274)	-0.602. (0.322)	-1.603. (0.911)
GDPpc asymmetry * ln FDI	0.034 (0.313)	0.847* (0.389)	1.918 (1.174)
GDP asymmetry * lnofficial development assistance and official aid received	-0.641. (0.359)	0.225 (0.317)	2.143* (0.895)
GDPpc asymmetry * lnofficial development assistance and official aid received	0.781. (0.461)	0.016 (0.411)	-1.723. (0.996)
GDP asymmetry * (DAC aid received by PTA members/ DAC aid received)	-27.806*** (8.213)	-9.302. (5.156)	29.383* (13.507)
GDPpc asymmetry * (DAC aid received by PTA members/ DAC aid received)	26.068*** (7.839)	11.654. (6.086)	-24.173. (12.72)
Political Pressure			
PTA members on Special 301 Reports (sum)	-0.116** (0.036)	-0.074* (0.034)	0.175. (0.102)
Veto Players			
Veto players (sum)	0.176*** (0.052)	0.039 (0.032)	-0.255. (0.15)
Endogeneity			
PTA depth	0.235** (0.082)	0.024 (0.066)	-0.085 (0.197)
Regime Preference			
Index IPR multilateral coherence (sum)	0.02*** (0.004)	-0.009* (0.004)	-0.086*** (0.025)
Control Variables			
Democratisation (Polity 2) (mean)	0.01 (0.035)	0.116*** (0.031)	0.219* (0.104)
Classic IP leaders	0.882* (0.348)	-0.124 (0.289)	-1.292 (0.859)

Countries with a high increase of patent protection	0.256 (0.278)	-0.493. (0.291)	-2.801** (1.072)
New IP producers and developers	-0.57. (0.302)	0.055 (0.255)	1.31. (0.745)
ln GDP (mean)	-0.005 (0.159)	0.247. (0.147)	0.089 (0.386)
ln GDPpc (mean)	0.082 (0.184)	0.359* (0.173)	0.393 (0.464)
ln Geographic distance (mean)	0.043 (0.166)	0.273. (0.147)	0.059 (0.354)
Intercept	–	-11.381** (3.762)	-5.108 (9.631)
Model	m9epa1_op	m9epa1_zip	m9epa1_zip
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	392	392	392

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Economic power asymmetry has a significant effect on the index IPR specific enforcement. The GDP asymmetry and GDP per capita asymmetry variables have no significant effects on the number of specific IPR enforcement variables in PTAs. However, in combination with other PTA elements, they have a significant effect. In combination with substantial tariff cuts, GDP asymmetry has a significantly positive (*26.484*) and GPD per capita a significantly negative effect (-*26.183*) on the number of specific IPR enforcement provisions in the PTA. This means that PTAs including substantial tariff cuts and are additionally signed amongst countries with more unequal living standards are less likely to include specific IPR enforcement provisions, whereas if the PTA members have additionally very asymmetrical GDPs they are more likely to include specific IPR enforcement provisions.

This affect is inverted for the interaction term with FDI, where GDP asymmetry has a significantly negative effect (-*0.602*), and GDP per capita asymmetry shows a positive effect (*0.847*). The direction of the effect remains the same for the remaining economic asymmetry variables. GDP asymmetry has a significantly negative effect in combination with official development assistance and official aid received (log) (-*0.641*) resp. with the share of DAC aid received by PTA members of the total DAC aid received (-*27.806*), where GDP per capita asymmetry has a significantly positive effect in combination with official development assistance and official aid received (log) (*0.781*) resp. with the share of DAC aid received by PTA members of the total DAC aid received (*26.068*). The effects with the share of DAC aid received by PTA members of the total DAC aid received are the ones showing significant results for both the OP as well as both stages of the ZINB *epa* model. On the one hand, the results show that an increase in GDP asymmetry in combination with FDI or aid has a negative impact on the number of specific IPR enforcement provisions in the PTA. On the other, the analysis also indicates that a PTA between countries with a more dissimilar living standard and in combination with FDI or aid increase the number of specific IPR enforcement provisions.

Domestic interests have a significant effect on the specific IPR enforcement measures in PTAs, whereby the impact can be both positive as well as negative.

The count data of the ZIP *di* model shows a significantly negative effect for resident applications for patents (log) (*-1.261*) and a positive one for resident applications for industrial designs (*0.816*). For the cumulative measures, the effects are both inverted (patents: *1.048*; industrial designs: *-0.566*). So, for the resident applications for trademarks (log) the effect is significantly positive (*0.384*). This means that if in the year of PTA signature, resident applications for patents are increased then the PTA will include less specific IPR enforcement provisions unless the resident applications have already been strong over the years (cumulative effect). This effect is the opposite for industrial design applications and for the year of PTA signature also inverted for trademark applications.

Moreover, looking at the share that applications for patents by PTA members hold on the total applications for patents, the zero data of the ZIP *di* model shows a significant and pronounced negative effect (*-147.03*). This suggests that the larger the share of PTA member applicants for patents in the year of PTA signature, the less likely the PTA will fall into the excessive zero group. Yet, looking at the development of the share of applications for patents by PTA members on the total applications for patents the count data of the ZIP *di* also shows a significant and even more pronounced effect (*-219.1*). This indicates that if PTA members are main contributors to patent applications, they are much less likely to include specific IPR provisions in the PTA. A similar and smaller scale effect can be observed for the share of applications for trademarks by PTA members on the total applications for trademarks (*-0.562*).

The imports differentiated according to their technology-intensiveness also have substantial significant effects on the specific IPR enforcement in PTAs. First off, the only significantly positive effect can be observed for the imports of *mhtp* by PTA members (*0.209*). This means that the more medium-high-technology goods are imported by PTA members, the more specific IPR enforcement provisions are included in the PTA. However, the estimate suggests the effect to be on a comparatively low scale.

Looking at the share of imports of *htp* by PTA members on the total *htp* imports, the zero data of the ZIP *di* model suggest a significantly negative effect (*-967.638*), indicating that these PTAs are much less likely to be in the excessive zero group. For the share of imports of *mhtp* by PTA members on the total *mhtp* imports the effect is significantly negative (*-13.88*). This suggests that if countries are mainly importing *mhtp* products by their PTA members, then they are less likely to include specific IPR provisions in their PTAs. Thus, the effect for imports by PTA members is inverted, the higher the share of *mhtp* by PTA members is on the total *mhtp* imports. The effect is also significantly negative for the share of imports of *ltp* by PTA members on the total *ltp* imports shown in the count data of the ZIP *di* model (*-46.42*).

Table 41: Design Regression – Index IPR Specific Enforcement (sum) ~ Domestic Interests

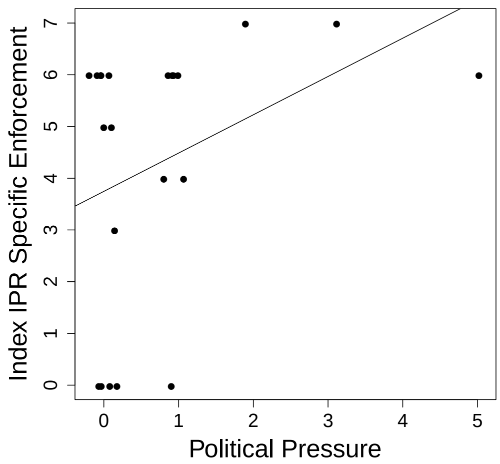
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests			
ln Charges for the use of IP, receipts (sum)	-0.016 (0.027)	-0.036 (0.031)	-0.991 (0.899)
ln Resident applications for patents (sum)	-0.106 (0.187)	-1.261*** (0.313)	-28.438 (23.629)
ln Resident applications for trademarks (sum)	0.384. (0.228)	0.232 (0.18)	-9.111 (7.959)
ln Resident applications for industrial design (sum)	-0.139 (0.159)	0.816*** (0.233)	26.328 (22.314)
ln Resident applications for patents (cumulative, sum)	-0.158 (0.206)	1.048** (0.325)	48.235 (38.181)
ln Resident applications for trademarks (cumulative, sum)	0.033 (0.228)	-0.115 (0.221)	-8.411 (11.083)
ln Resident applications for industrial design (cumulative, sum)	0.107 (0.211)	-0.566* (0.249)	-27.877 (23.392)
Applications for patents by PTA members / total applications for patents	0.66 (0.434)	-0.372 (0.281)	-147.03. (76.12)
Applications for trademarks by PTA members / total applications for trademarks	-0.562. (0.332)	-0.259 (0.242)	28.761 (19.701)
Applications for industrial designs by PTA members / total applications for industrial designs	-0.22 (0.307)	-0.055 (0.206)	45.819 (39.121)
Applications for patents by PTA members / total applications for patents (cumulative)	-83.59 (91.6)	-219.1* (94.29)	7.745 (23351.397)
Applications for trademarks by PTA members / total applications for trademarks (cumulative)	-5.009 (5.567)	0.764 (5.087)	-221.098 (195.718)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	1.184 (5.679)	4.893 (5.463)	440.24 (276.89)
Number of researchers in R&D (sum)	-0.05 (0.044)	-0.066 (0.042)	0.558 (1.376)

R&D expenditure (sum)	0.041 (0.161)	0.178 (0.151)	-1.267 (3.139)
Imports of htp by PTA members (sum)	-0.061 (0.07)	0.045 (0.047)	10.642 (9.194)
Imports of mhtp by PTA members (sum)	0.209* (0.086)	-0.081 (0.066)	-15.563 (13.243)
Imports of mltp by PTA members (sum)	-0.1 (0.081)	0.03 (0.061)	6.171 (6.203)
Imports of ltp by PTA members (sum)	0.009 (0.033)	0.011 (0.02)	-3.478 (4.015)
Imports of htp by PTA members / total htp imports	12.16 (8.589)	-2.708 (6.627)	-967.638* (413.811)
Imports of mhtp by PTA members / total mhtp imports	-13.88* (6.896)	5.317 (6.328)	807.435 (783.528)
Imports of mltp by PTA members / total mltp imports	14.19 (36.05)	39.72 (32.23)	305.159 (1522.554)
Imports of ltp by PTA members / total ltp imports	9.516 (28.02)	-46.42. (26.04)	-278.561 (712.623)
Political Pressure			
PTA members on Special 301 Reports (sum)	-0.103* (0.042)	-0.099* (0.048)	3.102 (3.258)
Veto Players			
Veto players (sum)	0.153* (0.062)	0.107* (0.049)	-2.632 (3.011)
Endogeneity			
PTA depth	0.201** (0.075)	-0.001 (0.064)	-18.261 (17.409)
Regime Preference			
Index IPR multilateral coherence (sum)	0.03*** (0.004)	0.009** (0.003)	-1.53 (1.242)
Control Variables			
Democratisation (Polity 2) (mean)	0.001 (0.029)	0.043* (0.022)	4.272 (3.739)
Classic IP leaders	1.242*** (0.349)	0.377 (0.269)	-18.793 (12.428)
Countries with a high increase of patent protection	-0.119 (0.259)	-0.406* (0.202)	-26.399 (19.071)
New IP producers and developers	0.347 (0.245)	0.229 (0.177)	7.396 (2225.059)
ln GDP (mean)	0.23. (0.138)	0.314* (0.128)	9.731. (5.914)
ln GDPpc (mean)	0.271. (0.153)	-0.012 (0.14)	-24.242 (17.733)
ln Geographic distance (mean)	-0.01 (0.116)	0.017 (0.094)	2.786 (3.321)
Intercept	–	-9.519** (2.911)	55.328 (119.968)
Model	m9di1_op	m9di1_zip Count Data (Stage 2)	m9di1_zip Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Political pressure has a significantly negative effect on the index IPR specific enforcement, whereby the highest estimate can be found in the *pdg* model (*-0.148*). This means that with every additional PTA member mentioned in the "Special 301 Reports", the score on the index IPR specific enforcement decreases. Of course, the expected relation would be inverted. *Graph 21* plots the relation for the subset of US agreements to see if this is different for the PTAs with US involvement.

Graph 21: Jittered Scatter Plot: Index IPR Specific Enforcement ~ Political Pressure (US PTAs)



Indeed, the regression line in the plot shows a clear positive relationship between political pressure and the index IPR specific enforcement. All US PTA except one show that when at least one PTA member is on the US list, the PTA includes four or more specific IPR enforcement provisions. For those agreements including more than one PTA member, the score on the index IPR specific enforcement is even higher (for values per PTA see *Appendix 23: List of US PTAs: Stringent IPR Indexes & Political Pressure I*).

Veto players have a significantly positive effect on the index IPR specific enforcement, whereby the most distinct effect is displayed in the economic power asymmetry model (*0.176*). Thus, the more veto players there are amongst PTA members, the more specific IPR enforcement provisions are included in the PTA. The effect is less pronounced for the domestic interest model, yet also significantly positive. For both these explanatory factors, the effect of veto players is significantly negative for the zero stage of the zero-inflated models, meaning that with every additional veto player amongst PTA members the odds ratio of the PTA being in the excess-zero group decreases and the PTA is more likely to include at least some specific IPR enforcement provisions. This effect is opposite the anticipated one and shows that with an increase of veto players, the need for specific enforcement provisions increases as well. Yet, this effect is not generalisable, as veto players show no significant effect on the seven path dependency models.

Endogeneity has as significant positive effect on the index IPR specific enforcement, whereby the most distinct estimate is the one for PTA depth (*0.243*). This means that the deeper the PTA, the more specific IPR enforcement provisions are included in the PTA.

Regime preference has a significantly positive as well as negative effect, whereby the most pronounced estimate can be found in the di model (*0.03*). Further, the two-stage model ZIP shows for the zero data a significantly negative effect (*-0.086*), indicating that the more and the more binding IPR multilateral coherence references can be found in PTAs, the less likely the PTA falls in the excess zero group for IPR specific enforcement.

Path dependency also has a significant effect on the specific IPR enforcement provisions in a PTA, whereby even the path dependency from general provision has a significant effect. For the *pdg* model, the most pronounced variables are found for the path dependency of general provisions on industrial designs (*1.142*) and patents (*-0.937*). This is consistent with the effects observed for specific IPR enforcement and the tangible IPR scope, and means that the more PTA members repeat provisions on industrial designs, the more likely the PTA also contains specific IPR commitments. The path dependency from specific IPR and TRIPS-plus commitment shown in the *pds* and *pdtp* model have a significant effect, yet once more on a fairly low impact level. For the *pdwss* and the *pdwfs* model, the effect is now significantly positive for enforcement and shows an estimate of *1*, accounting for the dependent variable being specific IPR enforcement.

Table 42: Design Regression – Index IPR Specific Enforcement (sum) ~ Path Dependency (world, force, TRIPS-plus)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	-0.085* (0.034)	-0.061. (0.035)	-0.038 (0.056)
Veto Players			
Veto players (sum)	-0.03 (0.033)	-0.005 (0.019)	0.037 (0.067)
Endogeneity			
PTA depth	0.233** (0.075)	0.038 (0.06)	0.326** (0.108)
Regime Preference			

Index IPR multilateral coherence (sum)	0.008. (0.005)	-0.001 (0.003)	0.005 (0.008)
Path Dependency			
Indexes based on binary TRIPS-plus categories pdw f – copyrights	-0.555 (0.65)	-0.034 (0.345)	-4.273 (1208)
Indexes based on binary TRIPS-plus categories pdw f – geographical indications	0.64 (0.573)	0.303 (0.363)	4.84 (1357)
Indexes based on binary TRIPS-plus categories pdw f – industrial designs	1.648*** (0.291)	1.116* (0.467)	1.06** (0.395)
Indexes based on binary TRIPS-plus categories pdw f – patents	0.74. (0.407)	0.186 (0.218)	5.459 (991.7)
Indexes based on binary TRIPS-plus categories pdw f – undisclosed information	0.714. (0.41)	0.376 (0.23)	4.841 (583.9)
Indexes based on binary TRIPS-plus categories pdw f – new plant varieties	1.218*** (0.348)	0.363. (0.187)	7.063 (911.6)
Indexes based on binary TRIPS-plus categories pdw f – traditional knowledge & genetic resources	0.575 (0.397)	-0.026 (0.211)	0.5 (2114)
Indexes based on binary TRIPS-plus categories pdw f – encrypted program-carrying satellite signals	-0.243 (0.378)	-0.209 (0.212)	-0.648 (2119)
Indexes based on binary TRIPS-plus categories pdw f – domain names	-2.122* (0.935)	-0.63 (0.472)	-6.509 (4854)
Indexes based on binary TRIPS-plus categories pdw f – enforcement	0.16 (0.317)	0.037 (0.183)	0.572 (0.726)
Indexes based on binary TRIPS-plus categories pdw f – exhaustion	-0.439 (0.356)	-0.183 (0.204)	5.742 (1032)
Control Variables			
Democratisation (Polity 2) (mean)	0.012 (0.028)	0.024 (0.024)	-0.014 (0.034)
Classic IP leaders	0.998** (0.325)	0.457. (0.266)	-0.416 (0.585)
Countries with a high increase of patent protection	0.027 (0.296)	0.083 (0.24)	0.195 (0.37)
New IP producers and developers	0.187 (0.239)	0.069 (0.172)	0.13 (0.337)
ln GDP (mean)	0.124 (0.101)	0.081 (0.081)	0.111 (0.148)
ln GDPpc (mean)	-0.114 (0.138)	-0.044 (0.109)	-0.041 (0.209)
ln Geographic distance (mean)	0.189 (0.125)	0.089 (0.098)	0.075 (0.181)
Intercept	–	-3.111 (2.294)	-5.794* (2.882)
Model	m9pdwftp1 _op	m9pdwftp1 _hp	m9pdwftp1 _hp
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	484	484	484

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

For the *pdwstp* model, the most pronounced effects can be observed for the TRIPS-plus categories of industrial design (*1.986*), new plant varieties (*1.354*) and domain names (-*1.986*). This means that PTAs repeating TRIPS-plus provisions on industrial design and or new plant varieties already found in other PTAs are more likely also to include specific IPR enforcement commitments. So, the opposite effect can be observed for path dependency from TRIPS-plus domain names provisions. In *Table 42*, I display the regression analysis for the *pdwftp* model, which shows the same significant effects as the *pdwstp* model, yet with even more distinct estimates. This suggests that the path dependency for TRIPS-plus provision increases after a PTA has entered into force.

Control variables have a significant effect on the index IPR specific enforcement. The most consistent and most distinct effect can be observed for the classic IP leaders – US, EU, EFTA and Japan. If one of these countries is a PTA member, the score on the index IPR specific enforcement increases (*1.242*), i.e. their PTAs are more likely to include specific enforcement provisions on IPR. On the other hand, new IP producers and developers – Israel, South Korea, Singapore and Taiwan – have a less distinct and significantly effect on specific IPR enforcement provisions (-*0.57*). The effect of the third country group is less conclusive than for the other country groups. Countries with a high increase of patent protection – Brazil, China, India and Mexico – show the most distinct effect in the count data of ZIP *epa* model (-*0.493*) and zero data of ZIP *epa* model (-*2.801*). This means that countries with a high increase of patent protection are much less likely to be in the excessive zero group (zero data effect) and thus potentially could include something on specific IPR enforcement. However, they tend to include less on specific IPR enforcement in their PTAs (count data effect).

A similar effect can be observed for the average democratisation, which scores most distinctly in count data of ZIP *epa* model (*0.116*) and zero data of ZIP *epa* model (*0.219*). Hereby, the positive value on the zero data means that the more democratised PTA members are on average, the more likely they include nothing on IPR specific enforcement due to structural issues (zero stage). Yet amongst those PTAs that possibly could include such provisions, the ones with a higher score on the Polity 2 index also are more likely to include specific enforcement provisions.

The other control variables all have a significantly positive effect on the score of IPR specific enforcement: average GDP (log) (*0.23*), average GDP per capita (log) (*0.271*) and average geographic distance (log), which only shows a positive effect for the two-stage models such as the count data of ZIP *epa* model (*0.273*).

The other regression tables are included in *Appendix 42: Design Regression – Index IPR Specific Enforcement (sum) ~ Path Dependency (general)*, *Appendix 43: Design Regression – Index IPR Specific Enforcement (sum) ~ Path Dependency (specific)*, *Appendix 44: Design Regression – Index IPR Specific Enforcement (sum) ~ Path Dependency (TRIPS-plus)*, *Appendix 45: Design Regression – Index IPR Specific Enforcement (sum) ~ Path Dependency (world, signature, specific)*, *Appendix 46: Design Regression – Index IPR Specific Enforcement (sum) ~ Path Dependency (world, signature, TRIPS-plus)*, and *Appendix 47: Design Regression – Index IPR Specific Enforcement (sum) ~ Path Dependency (world, force, specific)*.

4.3.2.5 Index IPR Multilateral Coherence (sum)

The explanatory factors with the most effect on the index IPR multilateral coherence are economic power asymmetry displayed in regression *Table 43*, domestic interests in *Table 44* and path dependency world entry into force (*pdwfs*, *pdwftp*) *Table 45*.

Economic power asymmetry has a significant effect on the index IPR multilateral coherence, whereby the most distinct effect can be observed for GDP asymmetry and GDP per capita asymmetry. For the former, the effect is negative (*-19.913*) and for the latter positive (*23.076*). This means that countries with a higher GDP asymmetry are less likely to include references to IPR multilateral agreements, whereas countries with more asymmetrical living standards are more likely to do so. This effect is inverted for the interaction term substantial tariff cuts, where in combination with GDP asymmetry the effect is significantly positive (*4.341*) and with GDP per capita asymmetry negative (-*4.466*).

The same direction of effects can also be observed for the interaction term of GDP asymmetry with official development assistance and official aid received (log) (*0.893*) resp. the same interaction term with GDP per capita asymmetry (-*1.099*). This means that an increase in GDP asymmetry in combination with substantial tariff cuts or aid has a positive effect on the number and or bindingness of IPR multilateral coherence commitments in PTAs and vice versa for GDP per capita. For example, if a PTA includes substantial tariff cuts and the GDP amongst PTA member is highly different, then the PTA is more likely to include more (binding) references to IPR multilateral agreements.

No significant effect can be observed for the interaction terms with FDI nor the share of DAC aid received by PTA members of the total DAC aid received.

Table 43: Design Regression – Index IPR Multilateral Coherence (sum) ~ Economic Power Asymmetry

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Economic Power Asymmetry			
GDP asymmetry (max/sum)	-6.873 (5.129)	-19.913* (8.051)	11.226 (18.156)
GDPpc asymmetry (max/sum)	5.765 (6.336)	23.076* (9.849)	-16.054 (22.807)
GDP asymmetry * substantial tariff cuts	0.724 (0.818)	4.341* (1.821)	3.416 (2.636)
GDPpc asymmetry * substantial tariff cuts	0.351 (1.025)	-4.466. (2.381)	-4.489 (3.429)
GDP asymmetry * ln FDI	-0.097 (0.093)	-0.133 (0.166)	0.317 (0.292)
GDPpc asymmetry * ln FDI	0.104 (0.108)	0.132 (0.201)	-0.421 (0.375)
GDP asymmetry * lnofficial development assistance and official aid received	0.48. (0.251)	0.893* (0.362)	-1.149 (1.151)
GDPpc asymmetry * lnofficial development assistance and official aid received	-0.414 (0.316)	-1.099* (0.462)	1.377 (1.413)
GDP asymmetry * (DAC aid received by PTA members/ DAC aid received)	1.684 (2.837)	3.305 (4.001)	38.823 (99.047)
GDPpc asymmetry * (DAC aid received by PTA members/ DAC aid received)	-2.596 (3.511)	-4.266 (4.354)	-65.759 (180.701)
Political Pressure			
PTA members on Special 301 Reports (sum)	0.066* (0.028)	0.009 (0.031)	-0.193 (0.125)
Veto Players			
Veto players (sum)	0.015 (0.025)	-0.04 (0.03)	-0.07 (0.146)
Endogeneity			
PTA depth	0.156* (0.061)	0.098 (0.079)	-0.368* (0.186)
Index IPR enforcement (sum)	0.221*** (0.035)	0.141*** (0.036)	-2.182*** (0.567)
Control Variables			
Democratisation (Polity 2) (mean)	0.057*** (0.017)	0.01 (0.026)	-0.071* (0.035)
Classic IP leaders	0.008 (0.263)	0.368 (0.294)	0.286 (1.252)
Countries with a high increase of patent protection	-0.235 (0.213)	0.308 (0.336)	0.747 (0.523)
New IP producers and developers	-0.298 (0.194)	-0.345 (0.252)	0.096 (0.447)
ln GDP (mean)	-0.184* (0.084)	0.105 (0.127)	0.462. (0.253)
ln GDPpc (mean)	0.462*** (0.11)	-0.175 (0.172)	-0.861* (0.342)
ln Geographic distance (mean)	-0.155. (0.09)	-0.181 (0.131)	0.051 (0.219)

Intercept	–	3.4 (2.549)	-0.535 (3.707)
log(theta)	–	-0.062 (0.121)	–
Model	m10epa1_op	m10epa1_zinb	m10epa1_zinb
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	392	392	392

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Domestic interests have a significant effect on IPR multilateral coherence, yet most of the variables only have a low-scale impact. The main drivers are the share of application on industrial design, respectively *mhtp* and *ltp* imports by PTA members.

A significantly negative effect can be observed for the resident applications for patents (log) (-*0.166*) and for trademarks (log) in the count data of the ZINB *di* model (-*0.442*) and its zero data (-*0.862*). This means that with an increase of patent or trademark applications by residents, the content of IPR multilateral coherence in the PTA decreases. The opposite effect can be observed for the resident applications for industrial designs (log), which have a positive effect (*0.236*) on the index IPR multilateral coherence. Looking at the development over time and the cumulative effects, the resident applications for patents (*0.239*) and trademarks (count data of the ZINB *di* model: *0.38*) have a significantly positive effect on multilateral coherence commitment in PTAs, whereas the resident applications for industrial designs show a negative effect for the count data of the ZINB *di* model (-*0.459*). Thus, an increase of the cumulative resident applications has a positive effect for patents and trademarks on the number and bindingness of IPR multilateral commitments whilst the effect is inverted for cumulative residential applications for industrial designs Looking at the share of applications by PTA members on the total applications, the effect is significantly negative for patents (-*0.537*) and industrial designs (count data of the ZINB *di* model: -*0.335*), yet positive for trademarks (*0.942*). The effect of trademark shares is not reinforced by looking at the cumulative data, as the zero data of the ZINB *di* model shows that the log odds of being an excessive zero increase by *13.18* for an increase of the share of applications for industrial designs by PTA members on the total applications for industrial designs. Subsumed, if PTA members make up a large share of the total applications for patents and industrial design, the PTA contains fewer and or less binding commitments on IPR multilateral coherence. The effect is inverted for the share of trademark applications.

Table 44: Design Regression – Index IPR Multilateral Coherence (sum) ~ Domestic Interests

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests			
ln Charges for the use of IP, receipts (sum)	0.012 (0.014)	-0.005 (0.02)	-0.037 (0.023)
ln Resident applications for patents (sum)	-0.166. (0.094)	-0.2 (0.181)	-0.03 (0.201)
ln Resident applications for trademarks (sum)	0.132 (0.123)	-0.442* (0.196)	-0.862* (0.364)
ln Resident applications for industrial design (sum)	0.236* (0.099)	0.338* (0.165)	-0.093 (0.175)
ln Resident applications for patents (cumulative, sum)	0.239* (0.099)	0.544*** (0.162)	0.001 (0.203)
ln Resident applications for trademarks (cumulative, sum)	-0.043 (0.135)	0.38* (0.188)	0.434 (0.376)
ln Resident applications for industrial design (cumulative, sum)	-0.137 (0.112)	-0.459** (0.161)	0.041 (0.209)
Applications for patents by PTA members / total applications for patents	-0.537* (0.268)	-0.329 (0.3)	1.709. (0.965)
Applications for trademarks by PTA members / total applications for trademarks	0.942*** (0.215)	0.616** (0.229)	-1.224. (0.716)
Applications for industrial designs by PTA members / total applications for industrial designs	-0.174 (0.168)	-0.335. (0.19)	-0.447 (0.631)
Applications for patents by PTA members / total applications for patents (cumulative)	55.479 (51.424)	36.03 (49.78)	-113.7 (120.5)
Applications for trademarks by PTA members / total applications for trademarks (cumulative)	0.894 (2.053)	-2.973 (2.693)	-1.932 (5.56)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	-2.523 (2.808)	3.825 (3.422)	13.18. (7.073)
Number of researchers in R&D (sum)	0.117*** (0.023)	0.008 (0.034)	-0.16*** (0.043)
R&D expenditure (sum)	-0.182* (0.082)	-0.029 (0.107)	0.366. (0.194)
Imports of htp by PTA members (sum)	0.019 (0.042)	0.088 (0.057)	-0.019 (0.093)
Imports of mhtp by PTA members (sum)	0.032 (0.05)	-0.093 (0.064)	-0.147 (0.126)
Imports of mltp by PTA members (sum)	0.004 (0.048)	0.006 (0.056)	0.249. (0.147)
Imports of ltp by PTA members (sum)	-0.063* (0.025)	-0.027 (0.029)	-0.086 (0.084)
Imports of htp by PTA members / total htp imports	1.691 (5.71)	-10.97 (6.805)	-11.46 (13.22)
Imports of mhtp by PTA members / total mhtp imports	-1.348 (3.924)	13.65* (5.963)	20.78* (9.362)
Imports of mltp by PTA members / total mltp imports	-10.259 (20.634)	-4.78 (26.32)	51.34 (36.68)

Imports of ltp by PTA members / total ltp imports	7.585 (15.76)	-12.97 (20.93)	-85.94** (32.05)
Political Pressure			
PTA members on Special 301 Reports (sum)	0.008 (0.03)	0 (0.033)	-0.036 (0.072)
Veto Players			
Veto players (sum)	-0.208*** (0.052)	-0.101. (0.058)	0.367* (0.165)
Endogeneity			
PTA depth	0.253*** (0.051)	0.118. (0.065)	-0.393** (0.126)
Index IPR enforcement (sum)	0.278*** (0.029)	0.14*** (0.028)	-1.838*** (0.332)
Control Variables			
Democratisation (Polity 2) (mean)	0.022 (0.016)	-0.008 (0.021)	-0.018 (0.031)
Classic IP leaders	-0.039 (0.253)	-0.069 (0.275)	-0.109 (0.706)
Countries with a high increase of patent protection	0.049 (0.199)	0.125 (0.275)	0.492 (0.461)
New IP producers and developers	-0.393* (0.186)	-0.714*** (0.197)	-0.798 (0.531)
ln GDP (mean)	-0.44*** (0.098)	-0.227. (0.124)	0.851** (0.28)
ln GDPpc (mean)	0.184* (0.091)	-0.004 (0.124)	-0.384. (0.208)
ln Geographic distance (mean)	-0.107 (0.071)	0.054 (0.091)	-0.202 (0.153)
Intercept	–	5.802* (2.563)	-10.32* (4.31)
log(theta)	–	0.2* (0.099)	–
Model	m10di1_op	m10di1_zin b	m10di1_zin b
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

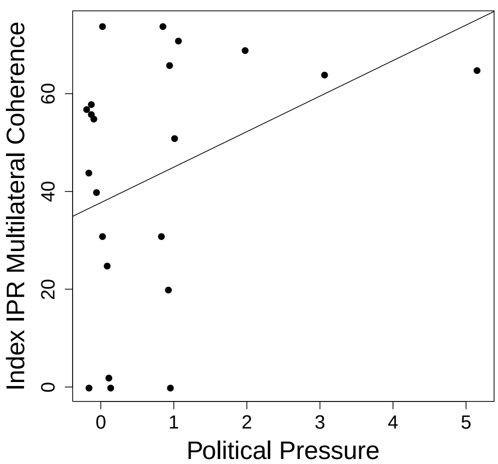
Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The number of researchers in R&D also shows a positive effect on the index IPR multilateral coherence (*0.117*), where the R&D expenditure has a negative one (*-0.182*). This means that PTA members investing more in R&D are less likely to reference IPR multilateral agreements in their PTAs, whereas PTA members with more researchers working in R&D are more likely to include such provisions.

The imports of *mltp* by PTA members show a positive effect for the zero data of the ZINB *di* model, meaning that the log odds of being an excessive zero increases by *0.249* for an increase in *mltp* imports by PTA members. Thus, the more *mltp* are imported by PTA members, the less likely the PTA will include IPR multilateral coherence provisions. Another, yet the minor-scale negative effect can be observed for the imports of *ltp* by PTA members (*-0.063*). The share of imports of *mhtp* by PTA members on the total *mhtp* imports shows a significantly positive effect for the count data of the ZINB *di* model (*13.65*) as well as the zero data (*20.78*). This means that with a larger share of *mhtp* imports by PTA members, the PTAs are more likely to include no IPR multilateral coherence (zero data effect), but if they do, than they are more likely to cover either a greater number and or to be more binding (count data effect). So, the share of imports of *ltp* by PTA members shows a significantly negative effect for the zero data of the ZINB *di* model (*-85.94*), meaning that these PTAs are less likely to be in the excessive zero group.

Political pressure shows significantly positive effects on the index IPR multilateral coherence for most models, with the most distinct estimate in the *pdg* model (*0.137*). *Graph 22* displays the jittered scatter lot for the subset of the US PTAs and shows that there is a significantly positive effect of political pressure on the index IPR multilateral coherence. All US PTAs besides one agreement score at least 20 or more if at least one PTA member is mentioned in the "Special 301 Reports" (for values per PTA see *Appendix 23: List of US PTAs: Stringent IPR Indexes & Political Pressure I*). This means that if the US signs an agreement, the PTA is more likely to include references to other IPR multilateral agreements if the PTA members are on the US list.

Graph 22: Jittered Scatter Plot: Index IPR Multilateral Coherence ~ Political Pressure (US PTAs)



Veto players have a significantly negative effect on the index IPR multilateral coherence, which is most distinctively shown in the *pdg* model (-*0.285*). This means that the more veto players there are amongst PTA members, the lower the score on the index IPR multilateral coherence. This can entail either that fewer IPR multilateral agreements are mentioned with an increased number of veto players or that the commitments are less binding. There is no significant effect for veto players in the economic power asymmetry model.

Endogeneity has a significantly positive effect on the index IPR multilateral coherence. The most pronounced effects are observed for PTA depth (*0.307*), substantial tariff cuts (*0.895*), and the index IPR enforcement (*0.29*). Looking at the two-stage HNB *pdwftp* model, both the count data (1.206) and zero data (0.77) show a significantly positive effect of substantial tariff cuts. This means that if a PTA includes substantial tariff cuts, it is more likely to include provisions on IPR multilateral agreements (zero data effect) and that it increases the number and or bindingness of these provisions (count data effect). Overall, the endogeneity variables are significantly and positively influenced by the endogeneity factors. This means that the more that PTA members are willing to agree upon regard depth and IPR enforcement, the more IPR multilateral coherence references are included in their PTAs

Regime preference is not included for the dependent variable of index IPR multilateral coherence, because regime preference is operationalised using the IPR multilateral coherence index (see *4.2.2.6 Data for Regime Preference*), i.e. both measures are identical.

Path dependency has some significant effects on the index IPR multilateral coherence, yet different ones than on the previously analysed dependent variables. For the *pdg* and *pdtp* models, there are only significant effects on a minor impact level. So, for the *pds* model, there is one noteworthy effect for tangible commitments on domain names, which shows for the zero data of the ZINB model a distinctly positive effect (*1.087*). This suggests that PTAs repeating commitments on domain names already included in their previous PTAs, are more likely to be in the excessive zero group for the index IPR multilateral coherence, and are thus less likely to include any references to IPR multilateral agreements.

Table 45: Design Regression – Index IPR Multilateral Coherence (sum) ~ Path Dependency (world, force)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure				
PTA members on Special 301 Reports (sum)	-0.001 (0.026)	0.082*** (0.023)	0.064* (0.031)	0.156* (0.069)
Veto Players				
Veto players (sum)	-0.056* (0.022)	-0.019 (0.025)	-0.038 (0.033)	-0.025 (0.076)
Endogeneity				
Substantial tariff cuts (dummy)	0.257*** (0.057)	0.895*** (0.179)	1.206*** (0.298)	0.77. (0.411)
Index IPR enforcement (sum)	-0.048 (0.079)	0.273*** (0.041)	0.078. (0.043)	2.027*** (0.26)
Path Dependency Specific				
Indexes based on binary IPR scope tangible pdw f – copyrights	-0.299 (0.353)	–	–	–
Indexes based on binary IPR scope tangible pdw f – trademarks	-1.226*** (0.363)	–	–	–
Indexes based on binary IPR scope tangible pdw f – geographical indications	-0.314 (0.229)	–	–	–
Indexes based on binary IPR scope tangible pdw f – industrial designs	-0.173 (0.379)	–	–	–
Indexes based on binary IPR scope tangible pdw f – patents	-0.447 (0.358)	–	–	–
Indexes based on binary IPR scope tangible pdw f – undisclosed information	0.844** (0.312)	–	–	–
Indexes based on binary IPR scope tangible pdw f – layout-designs of integrated circuits	1.672** (0.544)	–	–	–
Indexes based on binary IPR scope tangible pdw f – new plant varieties	0.644. (0.387)	–	–	–
Indexes based on binary IPR scope tangible pdw f – traditional knowledge & genetic resources	-0.387 (0.35)	–	–	–
Indexes based on binary IPR scope tangible pdw f – encrypted program-carrying satellite signals	0.517 (0.403)	–	–	–
Indexes based on binary IPR scope tangible pdw f – domain names	-3.745*** (0.569)	–	–	–
Index IPR specific enforcement pdw f (sum)	0.129 (0.133)	–	–	–
Index IPR multilateral coherence pdw f (sum)	1.215*** (0.058)	–	–	–
Path Dependency TRIPS-plus				
Indexes based on binary TRIPS-plus categories pdw f – copyrights	–	0.21 (0.204)	-0.232 (0.22)	0.655 (0.529)
Indexes based on binary TRIPS-plus categories pdw f – geographical indications	–	0.237 (0.48)	0.352 (0.588)	-1.013 (7540)

Indexes based on binary TRIPS-plus categories pdw f – industrial designs	–	0.237 (0.246)	0.028 (0.256)	18.43 (2293)
Indexes based on binary TRIPS-plus categories pdw f – patents	–	0.055 (0.37)	0.499 (0.345)	-4.365 (12710)
Indexes based on binary TRIPS-plus categories pdw f – undisclosed information	–	-0.102 (0.379)	0.139 (0.38)	-4.32 (13650)
Indexes based on binary TRIPS-plus categories pdw f – new plant varieties	–	-0.446 (0.281)	-0.153 (0.286)	-0.892 (6056)
Indexes based on binary TRIPS-plus categories pdw f – traditional knowledge & genetic resources	–	-0.52 (0.357)	-0.153 (0.336)	-3.444 (6041)
Indexes based on binary TRIPS-plus categories pdw f – encrypted program-carrying satellite signals	–	-0.34 (0.34)	-0.642* (0.325)	-0.53 (6438)
Indexes based on binary TRIPS-plus categories pdw f – domain names	–	0.614 (0.846)	0.167 (0.868)	-0.39 (15460)
Indexes based on binary TRIPS-plus categories pdw f – enforcement	–	0.949*** (0.273)	0.718** (0.254)	0.77 (3338)
Indexes based on binary TRIPS-plus categories pdw f – exhaustion	–	0.395 (0.306)	0.315 (0.296)	-1.802 (5568)
Control Variables	–			
Democratisation (Polity 2) (mean)	0.043** (0.017)	0.034* (0.014)	0.004 (0.02)	0.027 (0.036)
Classic IP leaders	-0.93*** (0.262)	-0.354 (0.236)	0.456. (0.257)	-0.5 (0.782)
Countries with a high increase of patent protection	-0.218 (0.21)	-0.154 (0.198)	0.154 (0.29)	-0.823 (0.624)
New IP producers and developers	-0.081 (0.18)	-0.304. (0.165)	-0.538** (0.187)	0.474 (0.467)
ln GDP (mean)	0.047 (0.064)	-0.072 (0.058)	-0.05 (0.076)	-0.271. (0.148)
ln GDPpc (mean)	0.061 (0.091)	0.194* (0.079)	-0.055 (0.107)	0.205 (0.195)
ln Geographic distance (mean)	0.097 (0.075)	-0.069 (0.069)	-0.046 (0.09)	0 (0.182)
Intercept	–	–	3.619** (1.375)	2.523 (2.824)
log(theta)	–	–	0.134 (0.117)	–
Model	m10pdwfs1_op	m10pdwftp2_op	m10pdwftp2_hnb	m10pdwftp2_hnb
			Count Data (Stage 2)	Zero Data (Stage 1)
Observations	484	484	484	484

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

For the *pdwss* model, the most pronounced effects can be found for tangible commitments on trademarks (*-1.029*), layout-designs of integrated circuits (*1.738*), domain names (-*3.532*) and multilateral coherence (*1.21*). This means that PTAs repeating tangible commitments on trademarks and or domain names decrease the likelihood of the PTA containing IPR multilateral coherence references. The effect functions vice versa for path dependency from layout-designs of integrated circuits and IPR multilateral agreements. For the *pdwstp* model, the most distinct effects of TRIPS-plus path dependency is observed for the enforcement category (*1.146*). This means that the PTAs including TRIPS-plus enforcement provisions already included in another PTA, increase the likelihood of the PTA including IPR multilateral coherence commitments.

Table 45 displays the regression analysis of the *pdwfs* and *pdwftp* models. The *pdwfs* model shows the same effects as the *pdwss* model, yet predominately on a higher impact level. Especially the negative path dependency effects are more pronounced after the PTA has entered into force. The *pdwftp* model also shows a significant effect of TRIPS-plus enforcement, however, on a slightly lower scale than in the *pdwstp* model. Overall, the path dependency effects are highly alike for the signature and the entry into force models. Nevertheless, the estimates of the path dependency variables range on a far lower scale than the *epa* or *di* variables, which relativises their explanatory power.

Control variables show a significant effect on the score on the index IPR multilateral coherence. The average democratisation has a marginal positive impact (*0.057*), and whereas the average GDP (log) has s clear negative effect on the IPR multilateral coherence commitments in PTAs (-*0.44*), the average GDP per capita (log) shows a clear positive effect (*0.462*). The average geographic distance (log) has a negative impact on the IPR multilateral coherence score (-*0.155*), meaning that countries that are further apart are less likely to include references to IPR multilateral agreements than those in closer proximity.

The country groups all show significant effects as well. Classic IP leaders – US, EU, EFTA and Japan – show ambiguous effects. The positive effect can only be found for the count data of the two-stage models such as the ZINB *pds* model (*0.477*). Moreover, the *pdwss* and *pdwfs* models suggest a significantly negative effect (-*0.791*; -*0.93*). Similarly, countries with a high increase of patent protection – Brazil, China, India and Mexico – show only for the count data of the two-stage models such as ZIP *pdtp* model a positive effect (*0.2*). The only clear results is the one of new IP producers and developers – Israel, South Korea, Singapore and Taiwan – that show a significantly negative effect on IPR multilateral coherence provisions (-*0.393*). Only the latter one can be generalised, and the effects for the classic IP leaders and countries with a high increase of patent protection have to be interpreted cautiously as they are only significant for the two-stage model with the less good fit for the data.

The remaining path dependency regression tables can be found in *Appendix 48: Design Regression – Index IPR Multilateral Coherence (sum) ~ Path Dependency (general)*, *Appendix 49: Design Regression – Index IPR Multilateral Coherence (sum) ~ Path Dependency (specific)*, *Appendix 50: Design Regression – Index IPR Multilateral Coherence (sum) ~ Path Dependency (TRIPS-plus)*, and *Appendix 51: Design Regression – Index IPR Multilateral Coherence (sum) ~ Path Dependency (world, signature)*.

4.3.2.6 Index IPR TRIPS-plus (sum)

The models with the most distinct estimates for the index IPR TRIPS-plus are the economic power asymmetry model in *Table 46*, domestic interests model in *Table 47* and path dependency models (*pdwss*, *pdwstp*) in *Table 48*.

Economic power asymmetry has a significant effect on the index IPR TRIPS-plus, yet unlike for the previous dependent variables, only the following three *epa* measures show a significant effect.

Table 46: Design Regression – Index TRIPS-plus (sum) ~ Economic Power Asymmetry

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Economic Power Asymmetry			
GDP asymmetry (max/sum)	-12.547 (9.258)	-12.739 (11.555)	-4.369 (24.914)
GDPpc asymmetry (max/sum)	16.494 (11.278)	21.925. (12.927)	11.437 (30.869)
GDP asymmetry * substantial tariff cuts	2.968 (2.308)	8.128 (6.82)	2.42 (6.097)
GDPpc asymmetry * substantial tariff cuts	-4.042 (2.558)	-9.295 (7.005)	-1.617 (8.392)
GDP asymmetry * ln FDI	0.08 (0.235)	-0.178 (0.359)	0.26 (0.812)
GDPpc asymmetry * ln FDI	-0.089 (0.243)	-0.042 (0.401)	-0.703 (1.002)
GDP asymmetry * lnofficial development assistance and official aid received	0.444 (0.399)	0.49 (0.308)	-0.249 (0.766)
GDPpc asymmetry * lnofficial development assistance and official aid received	-0.609 (0.514)	-0.654 (0.422)	0.417 (0.949)
GDP asymmetry * (DAC aid received by PTA members/ DAC aid received)	5.77 (6.161)	10.392. (5.539)	-8.56 (24.214)
GDPpc asymmetry * (DAC aid received by PTA members/ DAC aid received)	-12.436 (8.33)	-12.984* (6.589)	18.174 (42.57)

Political Pressure			
PTA members on Special 301 Reports (sum)	-0.044 (0.039)	-0.032 (0.028)	-0.15 (0.094)
Veto Players			
Veto players (sum)	0.053 (0.04)	-0.002 (0.037)	0.082 (0.108)
Endogeneity			
PTA depth	0.412*** (0.091)	0.127* (0.058)	-0.485* (0.234)
Index IPR specific enforcement (sum)	0.672*** (0.086)	0.25*** (0.05)	-1.956*** (0.533)
Regime Preference			
Index IPR multilateral coherence (sum)	0.018*** (0.005)	0.005 (0.004)	-0.039** (0.013)
Control Variables			
Democratisation (Polity 2) (mean)	-0.034 (0.035)	-0.018 (0.03)	0.001 (0.087)
Classic IP leaders	-0.246 (0.401)	-0.037 (0.333)	1.184 (1.042)
Countries with a high increase of patent protection	0.016 (0.327)	-0.509. (0.276)	0.683 (0.844)
New IP producers and developers	-0.603. (0.354)	-0.313 (0.275)	-0.517 (0.795)
ln GDP (mean)	0.154 (0.18)	0.35* (0.147)	0.149 (0.452)
ln GDPpc (mean)	-0.043 (0.202)	-0.192 (0.246)	0.492 (0.576)
ln Geographic distance (mean)	0.232 (0.188)	-0.018 (0.148)	-1.266* (0.556)
Intercept	–	-6.367 (5.148)	5.903 (8.74)
log(theta)	–	2.048*** (0.289)	–
Model	m11epa3_op	m11epa3_zinb	m11epa3_zinb
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	392	392	392

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

First off, GDP per capita asymmetry has a significantly positive effect (*21.925*) on the number of TRIPS-plus provisions in PTAs. The other two effects can be observed for the interaction term of GDP asymmetry with the share of DAC aid received by PTA members of the total DAC aid received (*10.392*) and the same interaction term GDP asymmetry per capita (*-12.984*). In combination with aid, the GDP per capita asymmetry changes the direction of its effect and becomes negative, i.e. the PTA is less likely to include TRIPS-plus provisions. So, if GDP asymmetry in combination with the share of DAC aid received by PTA members of the total DAC aid received increases, the PTA is more likely to include TRIPS-plus provisions. For example, if the GDP asymmetry between PTA members increases and or the PTA members make up for a substantial part of the DAC aid, then the PTA is more likely to include provisions that go beyond the TRIPS standard.

Domestic interests also have a significant effect on the index IPR TRIPS-plus. The first *di* measure with a significant effect is the received charges for the use of IP (log), which show a positive effect for the count data of the ZIP *di* model (*0.037*). This means that with an increase of the charges received for the use of IP across PTA members, the PTA is also more likely to contain TRIPS-plus provisions. Another positive effect on the TRIPS-plus content is observed for the resident applications for trademarks (log) (*0.656*), whereas the cumulative Resident applications for patents (log) (*-0.563*) and the count data of the ZIP *di* model for trademarks (log) (*-0.352*) have a significantly negative effect on how many TRIPS-plus provisions are included in PTAs.

Looking at the share of applications for trademarks by PTA members on the total applications for trademarks, the count data of the ZIP *di* model shows a significant negative effect (*-0.424*). This means that an increase of the share of applications by PTA members on the total applications decreases the number of TRIPS-plus provisions in the PTA, which is opposite to the effect observed for IPR multilateral coherence. Moreover, the cumulative share of applications on the total applications has a significantly positive effect for patents (*188.8*) and for the zero data of the ZIP *di* model of trademarks (*31.392*). The latter indicates that the higher the share of PTA members on the cumulative trademark applications, the more likely their PTAs are in the excess zero group. The former means that the higher the share of PTA members on the total patent applications, the substantially more likely the PTA includes TRIPS-plus provisions.

The imports of *mhtp* by PTA members show for the count data of the ZIP *di* model a significantly negative effect (*-0.083*) where the imports of *mltp* by PTA members indicate a positive effect of the count data of the ZIP *di* model (*0.077*). Additionally, the imports of *ltp* by PTA members suggest a positive effect on the zero data of the ZIP *di* model (*0.154*). Thus, with higher imports of *ltp* by PTA members, PTAs are more likely to be in the excessive zero group, not including TRIPS-plus provisions. So, with an increase of the *mhtp* imports by PTA members, the PTA is less likely to include TRIPS-plus commitments respectively vice versa for *mltp* imports by PTA members.

The share of imports by PTA members on the total imports has a significantly positive effect on one hand for the count data of the ZIP *di* model for *mhtp* (*6.689*) and on the other hand for *ltp* (*47.1*). This means that the higher the share of *mhtp* and or *ltp* imports by PTA members, the higher is also the likelihood of the PTA including TRIPS-plus commitments.

Table 47: Design Regression – Index TRIPS-plus (sum) ~ Domestic Interests

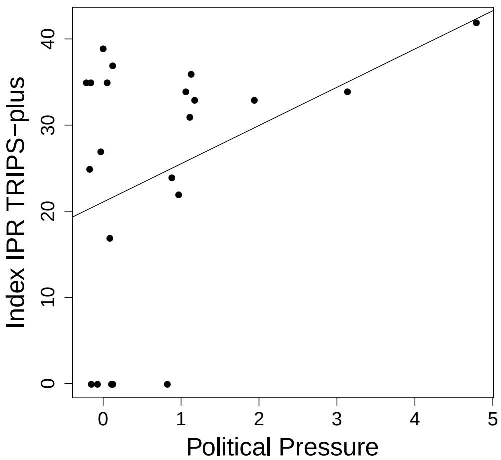
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests			
ln Charges for the use of IP, receipts (sum)	0.004 (0.031)	0.037. (0.021)	0.047 (0.056)
ln Resident applications for patents (sum)	-0.258 (0.269)	-0.178 (0.256)	-0.457 (0.685)
ln Resident applications for trademarks (sum)	0.656* (0.258)	0.223* (0.096)	-0.218 (0.788)
ln Resident applications for industrial design (sum)	-0.2 (0.189)	-0.279 (0.213)	0.033 (0.316)
ln Resident applications for patents (cumulative, sum)	-0.563. (0.308)	-0.092 (0.266)	0.91 (0.653)
ln Resident applications for trademarks (cumulative, sum)	0.344 (0.281)	-0.352* (0.169)	-1.031 (0.836)
ln Resident applications for industrial design (cumulative, sum)	-0.149 (0.226)	0.136 (0.214)	-0.139 (0.461)
Applications for patents by PTA members / total applications for patents	0.243 (0.402)	0.101 (0.141)	0.546 (1.826)
Applications for trademarks by PTA members / total applications for trademarks	-0.042 (0.362)	-0.424** (0.151)	-2.265 (1.648)
Applications for industrial designs by PTA members / total applications for industrial designs	0.065 (0.283)	0.133 (0.113)	0.271 (1.009)
Applications for patents by PTA members / total applications for patents (cumulative)	188.8* (92.35)	14.397 (40.064)	-267.094 (272.235)
Applications for trademarks by PTA members / total applications for trademarks (cumulative)	-4.808 (5.98)	3.598 (3.006)	31.392. (17.225)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	-1.711 (5.212)	-1.129 (2.9)	-4.08 (15.831)
Number of researchers in R&D (sum)	-0.021 (0.051)	0.004 (0.029)	0.075 (0.125)
R&D expenditure (sum)	0.073 (0.166)	0.129 (0.085)	0.286 (0.324)
Imports of htp by PTA members (sum)	0.008 (0.071)	0.025 (0.029)	-0.109 (0.17)
Imports of mhtp by PTA members (sum)	-0.134 (0.092)	-0.083* (0.041)	-0.07 (0.194)
Imports of mltp by PTA members (sum)	0.175. (0.092)	0.077* (0.036)	-0.065 (0.176)

Imports of ltp by PTA members (sum)	0 (0.033)	-0.008 (0.011)	0.154. (0.089)
Imports of htp by PTA members / total htp imports	1.11 (9.483)	-3.848 (3.819)	-13.857 (20.274)
Imports of mhtp by PTA members / total mhtp imports	6.153 (7.862)	6.689* (3.34)	-7.635 (23.742)
Imports of mltp by PTA members / total mltp imports	-48.81 (39.13)	-18.137 (17.83)	150.519 (115.186)
Imports of ltp by PTA members / total ltp imports	47.1. (28.62)	20.199 (15.451)	-90.992 (71.908)
Political Pressure			
PTA members on Special 301 Reports (sum)	-0.124* (0.049)	-0.042. (0.024)	0.165 (0.152)
Veto Players			
Veto players (sum)	0.131. (0.074)	0.16*** (0.037)	0.426 (0.365)
Endogeneity			
PTA depth	0.314*** (0.086)	-0.003 (0.043)	-0.383. (0.196)
Index IPR specific enforcement (sum)	0.792*** (0.081)	0.138*** (0.029)	-1.313*** (0.31)
Regime Preference			
Index IPR multilateral coherence (sum)	0.025*** (0.005)	0.011*** (0.002)	-0.037** (0.013)
Control Variables			
Democratisation (Polity 2) (mean)	-0.032 (0.033)	-0.026* (0.012)	-0.035 (0.073)
Classic IP leaders	1.108** (0.408)	0.019 (0.195)	-1.5 (1.127)
Countries with a high increase of patent protection	-0.637. (0.326)	-0.019 (0.152)	1.192 (1.045)
New IP producers and developers	0.418 (0.302)	0.175. (0.106)	0.402 (0.714)
ln GDP (mean)	1.012*** (0.193)	0.763*** (0.102)	0.871 (0.582)
ln GDPpc (mean)	-0.05 (0.176)	-0.1 (0.084)	-0.528 (0.435)
ln Geographic distance (mean)	0.076 (0.134)	0.01 (0.056)	-0.02 (0.293)
Intercept	–	-13.338*** (2.052)	-3.982 (10.377)
Model	m11di3_op	m11di3_zip	m11di3_zip
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Political pressure has a significantly negative effect on the index IPR TRIPS-plus, where the *pdwfs* model shows the most pronounced effect (*-0.17*). To analyse if the effect is different for US PTAs, *Graph 23* plots the regression of the index IPR TRIPS-plus on political pressure. Same as with the previous plots, the effect for the US subset is inverted and shows a positive effect. This means that if at least one of the US PTA members is on the US list, then the PTA includes more than 20 TRIPS-plus provisions (expect from one PTA). For those PTAs with more PTA members mentioned in the "Special 301 Reports", the score on the index IPR TRIPS-plus is even higher (for values per PTA see *Appendix 23: List of US PTAs: Stringent IPR Indexes & Political Pressure I*).

Graph 23: Jittered Scatter Plot: Index IPR TRIPS-plus ~ Political Pressure (US PTAs)



Veto players have a significantly positive effect on the index IPR TRIPS-plus, showing the most distinct estimate for the *pdwfs* model (*0.197*). This means that an increase in the number of veto players also increases the number of TRIPS-plus provisions included in a PTA, which is contrary to the postulated hypothesis. However, there is not a significant effect across all models. Namely, there is no significant effect for the regression models of economic power asymmetry, *pdg* and *pds*.

Endogeneity has a significantly positive and negative effect on the index IPR TRIPS-plus. For PTA depth, the effect is mainly significantly positive (*0.412*). Yet, the HP model for *pdg* shows for PTA depth a significantly negative effect for the count data (*-0.098*). This means that even though there is no negative effect on the likelihood of the PTA including TRIPS-plus provisions, an increase on the PTA depth scale has a negative effect on the number of TRIPS-plus provisions in PTAs. The same effect can be observed for the *pdwfs* model. The regression analysis also shows a significant positive effect of both the IPR enforcement endogeneity measures index IPR enforcement (*0.422*) and index

IPR specific enforcement (*0.792*). This means that the more IPR enforcement provisions are included in the PTA, the more likely the PTA also includes TRIPS-plus provisions. Endogeneity thus has a positive effect on the TRIPS-plus content of the PTA, yet it can also curb the number of TRIPS-plus provisions included in the PTA.

Regime preference has a significantly positive impact on the index IPR TRIPS-plus, where the most distinct estimates are displayed in the *di* model (*0.025*). The two-stage models also show a significantly positive effect for the count data stage and negative effect on the zero stage of the ZIP *di* model (*0.011*; *-0.039*). Therefore, it can be assumed that with an increase of the IPR multilateral coherence content of PTAs, the amount of TRIPS-plus variables increases as well.

Path dependency has s significant effect on the TRIPS-plus variables in PTAs. The *pdg* model shows the most distinct and significant effects for the PTAs repeating the mentioning of geographical indications (zero data of the ZINB model: *-4.789*), industrial designs (*1.125*) and patents (*-1.368*). The effect of GIs shows that the log odds of the PTA being an excessive zero decreases by *-4.789*. The positive effect of industrial designs and the negative effect of patents reaffirm the relations observed for the index IPR specific, index IPR tangible scope and index IPR specific enforcement. Thus, a PTA that repeats mentioning of patents in their PTAs is less likely to include specific IPR as well as TRIPS-plus provisions. For the *pds* model only shows significant effects with a very low impact level. The *pdtp* model contains one distinct and significant positive effect for TRIPS-plus path dependency of layout-designs of integrated circuits (*1.044*). This means that the repetition of TRIPS-plus provisions on layout-designs of integrated circuits that have been included in a PTA member previous PTA increases the likelihood of the PTA including additional TRIPS-plus commitments. Astonishingly, the other TRIPS-plus categories show no significant path dependency effect.

Table 48 shows the effects on the *pdwss* and *pdwstp* models. The *pdwss* model shows only significantly positive effects of path dependency on the index IPR TRIPS-plus, namely for the tangible provisions on copyrights (*2.581*), geographical indications (*2.755*), industrial designs (*1.613*), layout-designs of integrated circuits (*1.011*), encrypted program-carrying satellite signals (*1.605*) and domain names (*2.475*). Interestingly enough, the *pdwstp* model shows no distinct effects of TRIPS-plus path dependency on the TRIPS-plus index. The same effects are observed for the *pdwfs* and the *pdwftp* models, yet on a lower impact level.

Table 48: Design Regression – Index TRIPS-plus (sum) ~ Path Dependency (world, signature)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure				
PTA members on Special 301 Reports (sum)	-0.168*** (0.038)	-0.074*** (0.019)	-0.052 (0.218)	-0.039* (0.017)
Veto Players				
Veto players (sum)	0.193*** (0.028)	0.062*** (0.008)	0.133 (0.141)	0.026*** (0.008)
Endogeneity				
PTA depth	-0.073 (0.095)	-0.098* (0.04)	0.555 (0.442)	0.072 (0.307)
Index IPR enforcement (sum)	0.323** (0.113)	0.061 (0.038)	0.312 (0.481)	0.044* (0.02)
Regime Preference				
Index IPR multilateral coherence (sum)	0.03 (0.019)	0.013* (0.005)	0.025 (0.182)	0.007*** (0.002)
Path Dependency Specific				
Indexes based on binary IPR scope tangible pdw s – copyrights	2.581*** (0.402)	0.65*** (0.133)	8.238 (1757)	–
Indexes based on binary IPR scope tangible pdw s – trademarks	-0.433 (0.407)	0.142 (0.143)	-0.483 (1.746)	–
Indexes based on binary IPR scope tangible pdw s – geographical indications	2.755*** (0.31)	0.417*** (0.099)	5.316** (1.778)	–
Indexes based on binary IPR scope tangible pdw s – industrial designs	1.613*** (0.419)	0.177. (0.105)	13.38 (1533)	–
Indexes based on binary IPR scope tangible pdw s – patents	-0.062 (0.385)	0.033 (0.108)	0.799 (2008)	–
Indexes based on binary IPR scope tangible pdw s – undisclosed information	-0.402 (0.316)	0.044 (0.084)	4.782 (2578)	–
Indexes based on binary IPR scope tangible pdw s – layout-designs of integrated circuits	1.011. (0.578)	0.167 (0.14)	8.314 (8282)	–
Indexes based on binary IPR scope tangible pdw s – new plant varieties	-0.631 (0.393)	0.022 (0.107)	-5.446 (6556)	–
Indexes based on binary IPR scope tangible pdw s – traditional knowledge & genetic resources	0.355 (0.36)	0.153 (0.109)	3.352 (2333)	–
Indexes based on binary IPR scope tangible pdw s – encrypted program-carrying satellite signals	1.605*** (0.425)	0.517*** (0.113)	-0.816 (2727)	–
Indexes based on binary IPR scope tangible pdw s – domain names	2.475*** (0.647)	0.449** (0.161)	-4.447 (5115)	–
Index IPR specific enforcement pdw s (sum)	-0.02 (0.178)	-0.056 (0.049)	-0.047 (1.008)	–
Index IPR multilateral coherence pdw s (sum)	-0.063 (0.093)	-0.029 (0.029)	-0.002 (0.907)	–
Path Dependency TRIPS-plus				
Indexes based on binary TRIPS-plus categories pdw s – copyrights	–	–	–	0.204 (0.153)

Indexes based on binary TRIPS-plus categories pdw s – geographical indications	–	–	–	0.13 (0.122)
Indexes based on binary TRIPS-plus categories pdw s – industrial designs	–	–	–	22.43 (1218)
Indexes based on binary TRIPS-plus categories pdw s – patents	–	–	–	0.081 (0.113)
Indexes based on binary TRIPS-plus categories pdw s – undisclosed information	–	–	–	0.539*** (0.134)
Indexes based on binary TRIPS-plus categories pdw s – layout-designs of integrated circuits	–	–	–	0.173. (0.095)
Indexes based on binary TRIPS-plus categories pdw s – new plant varieties	–	–	–	-0.156. (0.09)
Indexes based on binary TRIPS-plus categories pdw s – traditional knowledge & genetic resources	–	–	–	0.472*** (0.106)
Indexes based on binary TRIPS-plus categories pdw s – encrypted program-carrying satellite signals	–	–	–	0.057 (0.123)
Indexes based on binary TRIPS-plus categories pdw s – domain names	–	–	–	0.282 (0.254)
Indexes based on binary TRIPS-plus categories pdw s – enforcement	–	–	–	0.106 (0.104)
Indexes based on binary TRIPS-plus categories pdw s – exhaustion	–	–	–	0.138 (0.084)
Control Variables				
Democratisation (Polity 2) (mean)	-0.045 (0.032)	-0.01 (0.012)	-0.124 (0.107)	-0.009 (0.012)
Classic IP leaders	-0.148 (0.354)	-0.031 (0.108)	-2.638 (2.824)	0.208. (0.108)
Countries with a high increase of patent protection	0.031 (0.326)	-0.036 (0.108)	-0.709 (1.871)	-0.053 (0.118)
New IP producers and developers	-0.59. (0.314)	-0.035 (0.087)	-0.156 (1.427)	-0.076 (0.078)
ln GDP (mean)	0.328** (0.116)	0.119** (0.041)	0.632 (0.678)	0.142** (0.044)
ln GDPpc (mean)	0.014 (0.159)	-0.066 (0.06)	-1.145 (1.001)	-0.287*** (0.06)
ln Geographic distance (mean)	-0.259* (0.13)	-0.139** (0.053)	-0.17 (0.787)	-0.035 (0.052)
Intercept	–	-0.355 (1.036)	-10.79 (12.82)	–
Model	m11pdwss1_op	m11pdwss1_hp	m11pdwss1_hp	m11pdwstp2_p
		Count Data (Stage 2)	Zero Data (Stage 1)	
Observations	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Control variables have a significant effect on the Index IPR TRIPS-plus, whereby the majority of variables show a negative effect. For average democratisation, the effect can only be found for count data of the two-stage models such as the ZIP *di* model (-*0.026*), yet for the average GDP per capita (log) (-*0.329*) and the average geographic distance (log) (-*1.266*), the effect is found in the models fit the best fit for the data. The same applies to the average GDP (log) (*1.012*), which has a significantly positive effect. For instance, PTA members that are further away from one another are less likely to include TRIPS-plus provisions in their PTAs than those in closer proximity.

For the country groups, the effect of classic IP leaders – US, EU, EFTA and Japan – is significantly positive (*1.108*), and the effect for countries with a high increase of patent protection – Brazil, China, India and Mexico – (-*0.716*) and new IP producers and developers – Israel, South Korea, Singapore and Taiwan – (-*0.614*) are significantly negative. This means that the latter two are less likely to include TRIPS-plus provisions in their PTAs, whereas classic IP leaders are more likely to do so.

Those regression tables for path dependency not displayed here can be found in *Appendix 52: Design Regression – Index TRIPS-plus (sum) ~ Path Dependency (general), Appendix 53: Design Regression – Index TRIPS-plus (sum) ~ Path Dependency (specific), Appendix 54: Design Regression – Index TRIPS-plus (sum) ~ Path Dependency (TRIPS-plus),* and *Appendix 55: Design Regression – Index TRIPS-plus (sum) ~ Path Dependency (world,* force).

4.3.2.7 Additive Variables for TRIPS-plus Categories

The index IPR TRIPS-plus is based on the coding of the thirteen TRIPS-plus categories copyrights, trademarks, geographical indications, industrial design, patents, undisclosed information, layout-designs of integrated circuits, new plant varieties, traditional knowledge and genetic resources, encrypted program-carrying satellite signals, domain names, enforcement and exhaustion (for detailed coding see *Appendix 3: Codebook of T+PTA Dataset*). In this subchapter, I will take a closer look if the TRIPS-plus regulations on any category drive the effects observed for the index IPR TRIPS-plus. The regression tables can be found in *Appendix 22: Design Regression Tables of the Additive Variables for the TRIPS-plus* Categories.

Economic power asymmetry has only a significant effect on selected TRIPS-plus categories. GDP per capita asymmetry has a significantly positive effect on domain names (*1.238*), which is the identical effect as for tangible domain names provisions (see *4.3.2.3 Binary Variables for IPR Scope Tangible*). Even though the following effects are also similar, only those for domain names remain unchanged for the TRIPS-plus categories.

Further, the interaction term of GDP asymmetry with substantial tariff cuts has a positive effect on encrypted program-carrying satellite signals (*0.2*), and the same term combined with GDP per capita asymmetry has a significantly negative effect on industrial designs (-*0.371*) and layout-designs of integrated circuits (-*0.099*). This means that PTAs including substantial tariff cuts and have and or an increased GDP asymmetry between PTA members are more likely to include TRIPS-plus provisions on encrypted program-carrying satellite signals. Moreover, the effect is negative for TRIPS-plus provisions on industrial design and layout-designs of integrated circuits if the PTA includes nest to substantial tariff cuts an increased GDP per capita asymmetry amongst PTA members.

The interaction term of GDP asymmetry with FDI (log) has a significantly positive effect on patents (*1.798*) and domain names (*0.016*). This means that an increase in the GDP asymmetry and or the FDI amongst PTA members increases the likelihood of TRIPS-plus provisions on patents and domain names in their PTAs. An even more pronounced effect is found for the interaction term of GDP asymmetry with the share of DAC aid received by PTA members of the total DAC aid received, which has a significantly positive effect on undisclosed information (*73.33*). This effect turns negative for domain names if the GDP asymmetry per capita is included instead of the GDP asymmetry (-*122.8*). Accordingly, the GDP asymmetry in combination with the share of DAC aid received by PTA members of the total DAC aid received increases the likelihood of a PTA containing TRIPS-plus provisions on domain names, whereas the likelihood is decreased for the same interaction term with the GDP asymmetry per capita.

Domestic interests have both significantly positive as well as negative effects on the TRIPS-plus categories and in the subsequent paragraphs, I only highlight the most distinct ones. The resident applications for trademarks (log) have a significantly positive effect on TRIPS-plus on trademarks (*1.571*) and patents (*2.211*). This means that the more trademark applications are made by residents, the more likely the PTA includes TRIPS-plus provisions on trademarks as well as patents. The cumulative resident applications for patents (log) have a significantly negative effect on the TRIPS-plus provision on copyrights (-*1.352*) and for the zero data of the HP *di* model for geographical indications (-*1.438*). Thus, with an increase of the cumulative patent applications by residents, the likelihood of a PTA containing TRIPS-plus commitments on copyrights decreases and the PTAs are less likely to be in the excessive zero group for TRIPS-plus provisions for GIs.

The cumulative resident applications for trademarks (log) shows a significantly positive effect for tangible TRIPS-plus provisions for the count data of the HP *di* model for geographical indications (*1.226*), the zero data of the HP *di* model for geographical indications (*1.275*) and undisclosed information (*1.623*). This means that an increase of trademark applications by residents increases the likelihood of TRIPS-plus provisions on GI and undisclosed information. The cumulative resident applications for industrial design (log) have a significant effect on copyrights (*1.241*), patents (-*1.173*) and undisclosed information (-*1.091*). This means that the likelihood of the PTA including TRIPS-plus provisions on copyrights increases, the higher the applications for industrial designs by residents. This effect is inverted for patents and undisclosed information.

Besides the effects of resident applications, the applications by PTA members also show a highly significant effect. Firstly, the share of applications for patents by PTA members on the total applications for patents shows a significantly negative effect for TRIPS-plus provisions on trademarks (-*2.16*) and a positive one for enforcement (*1.938*). This means that the more of the overall patent applications are made by PTA members, the more likely the PTA include TRIPS-plus provisions on enforcement and the less likely ones on trademarks. Looking at its cumulative effect, the share of patent applications has a significantly positive effect for TRIPS-plus provisions on domain names (*11.13*). Secondly, the share of applications for trademarks by PTA members on the total applications for trademarks has a significantly negative effect on TRIPS-plus provisions on copyrights (-*1.486*) and a positive one for geographical indications (*1.562*) and its zero data of the HP *di* model (*2.616*). For the cumulative share, the effect turns significantly negative for GIs (-*21.73*) and for its zero data of the HP *di* model (-*40.148*). Thirdly, the share of applications for industrial designs by PTA members on the total applications for industrial designs has a significantly negative effect for TRIPS-plus provisions on copyrights (-*2.478*) and a positive one on patents (*1.344*), whereas the cumulative share show inverted effect for copyrights (*32.93*) as well as patents (-*26.531*).

There is also a significant positive effect of R&D expenditure on TRIPS-plus provisions on copyrights (*0.856*), trademarks (*0.944*) and undisclosed information (*0.887*). This means that PTAs signed amongst countries with a higher investment in R&D are more likely to include TRIPS-plus commitments on copyrights, trademarks and undisclosed information.

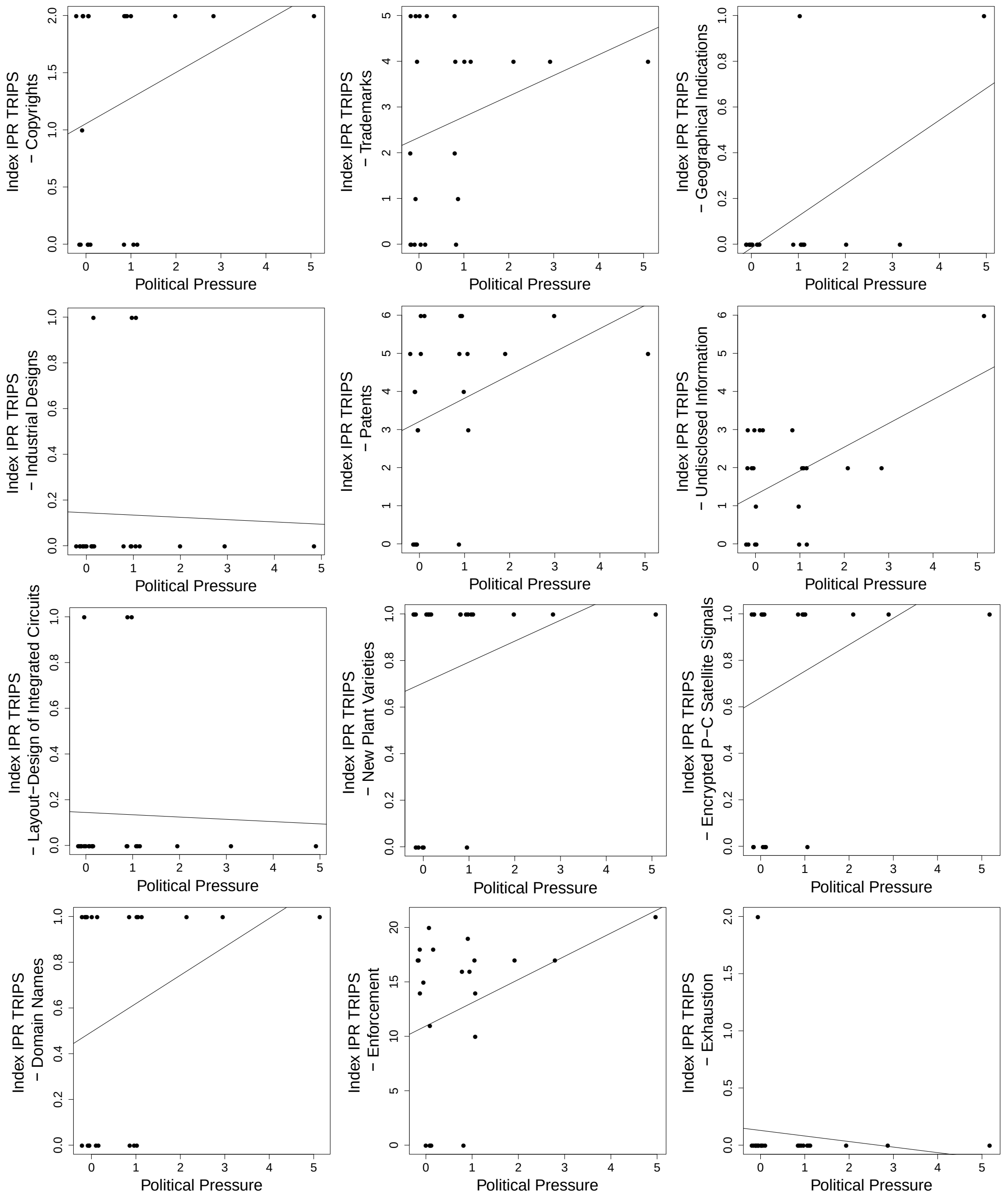
Furthermore, the share of imports of *htp* by PTA members on the total *htp* imports has a significant effect for TRIPS-plus provisions on trademarks (-*73.96*) and geographical indications (*19.57*), which is even more pronounced for the zero data of the HP *di* model for TRIPS-plus provisions on geographical indications (*43.201*). This means that the more high-technology products are imported by PTA members, the more likely the PTA contains TRIPS-plus commitments on trademarks and GIs. For the share of imports of *mhtp* by PTA members on the total *mhtp* imports there is only a significantly negative effect observed for the zero data of the HP *di* model for TRIPS-plus provisions on geographical indications (*-34.782*), suggesting the effect of *htp* imports is inverted for *mhtp* imports for TRIPS-plus provisions on GIs.

The share of imports of *mltp* by PTA members on the total *mltp* imports is significantly positive for TRIPS-plus provisions on trademarks (*234.3*), layout-designs of integrated circuits (*1.961*), encrypted program-carrying satellite signals (*5.747*) and domain names (*4.274*), as well as significant negative for TRIPS-plus enforcement (*-106.9*). This means that with an increase of the share of imports of medium-low-technology products, a PTA is more likely to include fewer TRIPS-plus provisions on enforcement and substantially more on trademarks, layout-designs of integrated circuits, encrypted program-carrying satellite signals and domain names. Finally, the share of imports of *ltp* by PTA members on the total *ltp* imports has a significantly negative effect for TRIPS-plus provisions on undisclosed information (*-58.04*) and a significantly positive effect on TRIPS-plus enforcement (*94.45*). Thus, with a higher share of *ltp* imports by PTA members, a PTA is more likely to include TRIPS-plus provisions on enforcement and less likely ones on undisclosed information.

Political pressure has both significantly positive as well as negative effects on the additive IPR TRIPS-plus indexes. The most distinct significantly positive effects for TRIPS-plus additive indexes are on copyrights (*0.015*), trademarks (*0.204*), TK & GR (*1.882*) and encrypted program-carrying satellite signals (*0.008*), where the most pronounced significantly negative effects for TRIPS-plus additive indexes are observed for geographical indications (*-0.174*), industrial design (*-0.019*), patents (*-0.381*), undisclosed information (*-0.011*), layout designs of integrated circuits (*-0.002*), new plant varieties (*-0.019*) and enforcement (*-0.358*). However, for some of these categories, the significant effect varies across models and shows s significantly positive effect for one model whilst a significantly negative effect for the next model.

Graph 24 on the following page displays the plots for each of the additive TRIPS-plus indexes regressed on political pressure for the subset of US PTAs.

Graph 24: Jittered Scatter Plot: Additive Variables for TRIPS-plus Categories ~ Political Pressure (US PTAs)



Unlike for the index IPR scope tangible, here, new plant varieties can be displayed. Even though the US PTAs do not include any specific provisions on new plant varieties, they do go beyond the TRIPS regulation by including specific conditions on the UPOV convention. However, there is no plot for traditional knowledge and genetic resources provisions, as the US PTAs do not include any TRIPS-plus provisions on this topic. For almost all areas of TRIPS-plus regulations, the effect of political pressure is positive, meaning that with an increase of the number of PTA members mentioned in the "Special 301 Reports", the probability of them including TRIPS-plus provisions on the corresponding category increases. The effect is less pronounced for geographical indications as only two of the US PTAs include TRIPS-plus provisions on said category (for the distinct values per PTA see *Appendix 26: List of US PTAs: Stringent IPR Indexes & Political Pressure IV*, *Appendix 27: List of US PTAs: Stringent IPR Indexes & Political Pressure V* and *Appendix 28: List of US PTAs: Stringent IPR Indexes & Political Pressure VI*).

However, there are also some categories that show a negative relation, namely industrial designs, layout-designs of integrated circuits and exhaustion. This effect might be explained if one looks at the positive scores on these categories, which are very rare, This might indicate that these categories are not a priority for the US and, therefore, not a category on which the US would focus its political pressure.

Veto players have significantly positive as well as negative effects on the different TRIPS-plus categories. The effects are significantly positive for enforcement (*0.264*) respectively negative for trademarks (*-0.102*), encrypted program-carrying satellite signals (*-0.012*) and domain names (*-0.009*). for half of the analysed categories, the effect is ambiguous: copyrights (*0.553*; *-0.014*), geographical indications (*0.144*; *-0.195*), industrial design (*0.006*; *-0.019*), undisclosed information (*0.008*; *-0.017*), new plant varieties (*0.006*; *-0.01*), traditional knowledge and genetic resources (*0.444*; *-3.869*), and domain names (*0.007*; *-0.009*). For example, for geographical indications the effect is significantly and distinctly negative for the zero stage of HP model (*-0.532*), which means that with every additional veto player the likelihood of the PTA including TRIPS-plus provisions on geographical indications decreases. For patents, layout-designs of integrated circuits and exhaustion, the regression tables show no significant effects of veto players.

Endogeneity has both significantly positive and or negative effects for the TRIPS-plus variables. PTA depth shows the most distinct significantly positive estimates for traditional knowledge and genetic resources (*4.731*) and significantly negative for new plant varieties (*-0.025*) and domain names (*-0.017*). For substantial tariff cuts, the effects can also be significantly positive, most pronounced for geographical indications (*1.706*), and negative, most distinctly for patents (*-3.748*). This means that the endogeneity effect of the PTA depth and substantial tariff cuts are linked to the specific IPR form. Whilst deeper PTAs have a positive effect on the TRIPS-plus content on TK & GR and other IPR forms, the effect is marginally negative for TRIPS-plus provisions on new plant varieties and domain names. So, substantial tariff cuts do not automatically lead to more TRIPS-plus provisions. PTAs including substantial tariff cuts are more likely to include TRIPS-plus provisions on geographical indications yet less likely patents. The endogeneity measures for enforcement show consistently positive effects, where the most distinct effect for the index IPR enforcement as well as for the index IPR specific enforcement is found for trademarks (*0.803*; *1.301*). Thus, the more IPR enforcement provsions are include in the PTA, the more TRIPS-plus provisions can be expected for the different IPR forms.

Regime preference has a significantly positive and or negative effect on the TRIPS-plus categories. The most distinct positive effects are observed for the categories of trademarks (*0.022*), geographical indications (*0.067*), new plant varieties (*0.004*), traditional knowledge and genetic resources (*0.118*) and enforcement (*0.051*), and the most distinct negative effects for industrial design (-*0.004*), patents (-*0.122*), undisclosed information (-*0.012*) and encrypted program-carrying satellite signals (-*0.001*). For the category of copyrights, the effect of regime preference is both significantly positive as well as negative (*0.002*; -*0.005*). However, these effects take place on a very low level, and there are no significant effects of regime preference for the categories layout-designs of integrated circuits, domain names and exhaustion.

Path dependency has multiple significant effects on the TRIPS-plus categories and in the subsequent paragraphs, I focus on the significant effects, which are most distinct for each of the seven path dependency models.

For the *pdg* model, the regression analysis shows a path dependency effect from mentioned copyright provisions on TRIPS-plus provisions about patents (*2.192*), from trademarks on TRIPS-plus provisions regarding TK & GR (-*9.779*), from GIs on TRIPS-plus provisions about TK & GR (*2.865*) and from domain names on TRIPS-plus provisions regarding TK & GR (-*1.18*). For instance, this means that PTAs, where its members repeat previously mentioned provisions on trademarks and or domain names, are less likely to include TRIPS-plus provisions on TK & GR, whereas the effect is positive for path dependency from geographical indications. Thus, the general path dependency also affects the design of TRIPS-plus provisions in PTAs.

The *pds* model shows significant effects of path dependency from trademarks on TRIPS-plus provisions about patents (-*1.278*) and undisclosed information (-*0.915*), path dependency from industrial designs on TRIPS-plus provisions regarding patents (*1.549*), and path dependency from encrypted program-carrying satellite signals on TRIPS-plus provisions about enforcement (*0.967*). This means that, for example, the specific path dependency from trademarks has a negative effect on patent and undisclosed TRIPS-plus provisions. Moreover, PTAs, where the PTA members repeat their previous specific provisions on encrypted program-carrying satellite signals, are more likely to include TRIPS-plus provisions on enforcement.

For the *pdtp* model, there are more distinct effects to be observed. This is to be expected, as the effects on the TRIPS-plus variables should be most pronounced for the path dependency out of PTA members own TRIPS-plus provisions in PTAs analysed by the variables in the *pdtp* model. It shows that there is a significant negative path dependency effect from copyrights on TRIPS-plus provisions about trademarks (-*0.507*; zero data of the HP *pdtp* model: -*0.972*), patents (-*1.218*), undisclosed information (-*0.916*), and TK & GR (-*2.984*). This means that PTAs, where PTA members repeat TRIPS-plus provisions on copyrights from their previous PTA, are less likely to include TRIPS-plus provisions on trademarks, patents, undisclosed information and traditional knowledge.

Further, the model displays a positive path dependency effect from patents on TRIPS-plus provisions regarding undisclosed information (*1.21*), and TK & GR (*3.527*) as well as from undisclosed information on TRIPS-plus provisions about TK & GR (*1.128*). This means that that if PTA members repeat patent resp. undisclosed information TRIPS-plus provisions from their previous PTAs, their PTAs are more likely to also include TRIPS-plus provisions on undisclosed information and or TK & GR. Moreover, the path dependency from layout-design of integrated circuits has a significantly positive effect on TRIPS-plus provisions regarding trademarks (*3.228*), patents (*1.869*), undisclosed information (*2.136*), and enforcement (*1.928*). This suggests that PTA members, which repeat TRIPS-plus commitments on layout-design of integrated circuits from their previous PTAs, are more likely to include TRIPS-plus provisions on trademarks, patents, undisclosed information and enforcement in their PTAs.

The model also shows that the path dependency from encrypted program-carrying satellite signals has a significantly negative effect on TRIPS-plus provisions about trademarks (-*2.088*), undisclosed information (-*1.064*), TK & GR (-*4.918*), and enforcement (-*0.922*), whereas the path dependency from domain names has a significantly positive effect on TRIPS-plus provisions regarding trademarks (*2.012*), patents (*1.376*), and enforcement (*0.92*). This means that whilst PTAs, where PTA members repeat their TRIPS-plus commitments on encrypted program-carrying satellite signals, are less likely to include TRIPS-plus provisions on the indicated categories, the repetition of commitments on domain names has a positive effect on TRIPS-plus provisions regarding trademarks, patent and enforcement.

The *pdwss* model displays the most distinct and significant path dependency effect on the TRIPS-plus categories. All of the specific path dependency variables have a significant effect, whereas only the ones for IPR multilateral coherence are not distinct enough to be highlighted. In the subsequent paragraph, I describe the effects in order of the explanatory variables.

Path dependency from specific copyright provisions has a significant effect on TRIPS-plus provisions about geographical indications (*1.33*), patents (*2.212*), TK & GR (*-2.869*), and enforcement (*1.942*). This means that PTAs repeating specific provisions on copyrights, which were already included in another signed PTA, are more likely to include TRIPS-plus provisions on GIs, patents and or enforcement, yet less likely TK & GR TRIPS-plus commitments.

Path dependency from trademarks has a significantly negative effect on TRIPS-plus provisions regarding geographical indications (*-1.689*), and enforcement (*-1.013*), where the path dependency from geographical indications has a significantly positive effect on TRIPS-plus provisions about geographical indications (*4.11*), patents (*1.715*), and enforcement (*1.102*). This means that PTAs repeating specific provisions on trademarks are more likely to lead to a decrease of TRIPS-plus provisions and vice versa for specific GI provisions.

Also, a consistently positive effect on TRIPS-plus commitments can be observed for path dependency from industrial designs on TRIPS-plus provisions regarding geographical indications (*1.846*), TK & GR (*6.561*), and enforcement (*1.061*). This means that PTAs repeating specific industrial design commitments are more likely to include TRIPS-plus provisions on GIs, TK & GR and enforcement. A substantial negative effect on TK & GR TRIPS-plus provisions can be observed for the path dependency from patents (*-5.748*). This suggests that PTAs, which repeat specific patent provisions are less likely to include TRIPS-plus provisions on TK & GR. Another positive effect on TK & GR TRIPS-plus provisions is visible for path dependency from undisclosed information (*5.045*).

Path dependency from layout-design of integrated circuits has a significant effect on TRIPS-plus provisions about trademarks (*1.334*), patents (*1.831*), TK & GR (*10.225*), and enforcement (-*1.433*). PTAs that repeat specific provisions on layout-design of integrated circuits are thus more likely to include TRIPS-plus provisions on trademarks, patent and TK & GR, as well as less likely TRIPS-plus enforcement commitments.

Path dependency from new plant varieties shows a significantly negative effect on TRIPS-plus provisions regarding geographical indications (-*1.835*), where the path dependency from TK & GR significantly affect TRIPS-plus provisions about geographical indications (-*1.144*), patents (-*1.652*), and TK & GR (*6.397*). The former shows that repeated specific provisions on new plant varieties are less likely included in the same PTA as GI TRIPS-plus provisions, whilst the latter states the same effect for specific TK & GR provisions and GI as well as patent TRIPS-plus commitments. Unsurprisingly, the effect of PTAs repeating specific TK & GR provisions is positive for TRIPS-plus provisions on TK & GR. Path dependency from encrypted program-carrying satellite signals shows a significantly positive effect on TRIPS-plus provisions regarding patents (*1.351*), encrypted program-carrying satellite signals (*0.95*), and enforcement (*2.12*). This means that PTAs, which repeat specific provisions on encrypted program-carrying satellite signals, are more likely to include TRIPS-plus commitments on patents, encrypted program-carrying satellite signals and enforcement.

There are positive and negative effects of path dependency from domain names, namely on TRIPS-plus provisions about copyrights (*0.988*), geographical indications (-*1.645*), patents (*3.423*), domain names (*1*), and enforcement (*1.132*). Thus, PTAs repeating specific domain name provisions are more likely to include TRIPS-plus provisions on copyrights, patents, domain names and enforcement, and less likely GI TRIPS-plus commitments.

Lastly, path dependency from enforcement has a significantly negative effect on TRIPS-plus provisions regarding TK & GR (-*1.548*). This means that PTAs repeating specific enforcement provisions are less likely to include TRIPS-plus commitments on traditional knowledge and genetic resources.

For the *pdwstp* model, there are fewer distinct effects. This is in so far astonishing, as the *pdwstp* model shows the analysis of path dependency from TRIPS-plus provisions in worldwide PTAs, i.e. beyond the scope of PTA members. However, the regression analysis shows much more significant effects for the *pdwss* model than the *pdwstp* model. The pronounced effects for the *pdwstp* model are limited to TRIPS-plus path dependency from copyright, patents, new plant varieties, encrypted program-carrying satellite signals, domain names and enforcement. The only negative effect can be observed for the path dependency from copyrights on TRIPS-plus provisions about trademarks (*-1.795*). This means that if PTAs repeat TRIPS-plus provisions on copyrights that were already included in another PTA, the PTA is less likely to include TRIPS-plus provisions on trademarks. The other path dependency effects are all positive: from patents on TRIPS-plus provisions regarding copyrights (*1.138*), from new plant varieties on TRIPS-plus provisions about industrial designs (*1*), from encrypted program-carrying satellite signals on TRIPS-plus provisions regarding undisclosed information (*1.633*), from domain names on layout-design on TRIPS-plus provisions about integrated circuits (*1*), and from enforcement on TRIPS-plus provisions regarding new plant varieties (*1.118*). This means that if the PTA repeats one of these TRIPS-plus provisions, which has previously been contained in another PTA, the PTA is more likely to contain TRIPS-plus provisions on the indicated categories.

For the *pdwfs* model, there are fewer effects to be observed than for the *pdwss* model, indicating that the signed PTAs have a stronger path dependency effect on the TRIPS-plus categories than the PTAs, which have entered into force. The effects of the *pdwfs* model are slightly more pronounced, yet show other no new relations. However, the effect on TK & GR TRIPS-plus provisions is far less pronounced for the path dependency from PTAs that have entered into force.

The *pdwftp* model shows highly similar effects as the *pdwstp* model: a positive effect of path dependency from patents on TRIPS-plus provisions about copyrights (*1.119*), from new plant varieties on TRIPS-plus provisions about industrial designs (*1*), from encrypted program-carrying satellite signals on TRIPS-plus provisions regarding undisclosed information (*1.615*), from domain names on TRIPS-plus provisions about layout-designs of integrated circuits (*1*), and from enforcement on TRIPS-plus provisions regarding new plant varieties (*1.112*). However, the negative effect of TRIPS-plus path dependency from copyrights on trademarks is not significant for the *pdwftp* model, whereas there is a distinct negative effect of the path dependency from undisclosed information on TRIPS-plus provisions regarding geographical indications (*-1.281*). This means that for those PTAs, which repeat TRIPS-plus provisions of PTAs that have already entered into force, are less likely to include TRIPS-plus commitments on geographical indications.

Conclusively, the learning from other PTAs specific IPR and TRIPS-plus commitments often increases the TRIPS-plus content of PTAs. Put another way, PTAs repeating specific IPR and TRIPS-plus provisions are prone to cover additional TRIPS-plus categories as well.

Control variables all show a significant effect on the various forms of TRIPS-plus categories, and I highlight the most pronounced and significant impacts per control variable.

For the average democratisation, the most distinct positive and negative effect can be observed for the TRIPS-plus provisions on geographical indications (*0.136*), which is even higher for the zero stage of the HP *di* model (*0.29*), and traditional knowledge and genetic resources (-*0.992*). This means, for instance, that the more democratic PTA members are on average, the less TRIPS-plus provisions on TK & GR such as benefits sharing are included in their PTAs. The country groups show the highest estimates amongst the control variables. Classic IP leaders – US, EU, EFTA and Japan – have a positive effect on TRIPS-plus commitments on undisclosed information (*1.579*) and a negative one on trademarks (-*1.811*). Countries with a high increase of patent protection – Brazil, China, India and Mexico – are more likely to include TRIPS-plus provisions on traditional knowledge and genetic resources (*3.308*) and less likely copyrights (-*2.197*) in their PTAs. So, new IP producers and developers – Israel, South Korea, Singapore and Taiwan – prefer TRIPS-plus provisions on patents (*1.159*) over commitments on TK &GR (-*4.562*). Thus, whilst the latter are less highly unlikely to include TK & GR in their PTAs, countries with a high increase of patent protection are much more prone to it.

The average GDP (log) shows a positive effect on TRIPS-plus provisions on trademarks (*1.533*) and a negative one for TK & GR (-*1.992*), where the average GDP per capita (log) has a positive effect on TRIPS-plus provisions on geographical indications (*1.123*) and also a negative effect TK & GR (-*2.251*). This means that with an increased wealth across PTA partners, the PTAs are less likely to include TRIPS-plus provisions on TK & GR. Additionally, the average geographic distance (log) has a positive effect on TRIPS-plus commitments on TK & GR (*1.018*) and a negative one on copyrights (-0.76). This implies that countries, which are further apart, are more likely to include TRIPS-plus provisions in their PTAs than those geographically closer to one another.

4.3.3 IPR DSM Design Analysis

The postulated explanatory factor for the IPR dispute settlement mechanism is veto players (*H4.4*; see *Table 23: Overview of IPR Design Features, Explanatory Factors and Hypotheses*). The regression *Table 49* shows that veto players indeed have a significantly negative effect on the IPR DSM in PTAs, i.e. that with every additional veto player a PTA is less likely to include a DSM provision on IPRs. However, the estimate is only significant for the OLS regression and indicates a minor impact on the index IPR DSM (-*0.011*).

Table 49: Design Regression – Index IPR DSM (dummy)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Veto Players			
Veto players (sum)	-0.011** (0.004)	-0.833 (272.222)	-0.016 (0.019)
Control Variables			
Democratisation (Polity 2) (mean)	0.008** (0.003)	1.308 (234.725)	0.075** (0.024)
Classic IP leaders	-0.001 (0.051)	2.258 (570.251)	-0.37 (0.268)
Countries with a high increase of patent protection	-0.118** (0.038)	-0.402 (779.872)	-0.459* (0.215)
New IP producers and developers	0.193*** (0.041)	0.119 (633.456)	0.686*** (0.197)
ln GDP (mean)	0.048*** (0.013)	0.345 (190.208)	0.301*** (0.083)
ln GDPpc (mean)	0.011 (0.017)	0.315 (419.246)	0.021 (0.118)
ln Geographic distance (mean)	0.089*** (0.016)	-2.494 (276.202)	0.435*** (0.1)
Intercept	-1.847*** (0.237)	-16.721 (3628.519)	-12.785*** (1.649)
Model	m13ols	m13hp Count Data (Stage 2)	m13hp Zero Data (Stage 1)
Observations	573	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Both the OLS as well as the hurdle model show that the control variables have highly significant effects on the DSM provisions, which is positively affected by democratisation, new IP producers and developer, the average GDP (log) and the geographical distance (log). Whereas the lowest impact in the OLS model is observed for changes in the democratisation measure (*0.008*), new IP producers and developer show the highest impact on the inclusion of a DSM in a PTA. Thus, if Israel, South Korea, Singapore or Taiwan are part of the agreement, then the score for IPR DSM increases by *0.193*. The opposite effect is observed for countries with a high increase in patent protection, which negatively affect the IPR DSM provisions. This means that if either one of the countries of this group – Brazil, China, India, Mexico – is part of the PTA, the score of the IPR DSM variables decreases by *-0.118*.

The zero data of the hurdle model shows the odds of those PTAs including IPR DSM versus those that do not include any IPR specific DSM. As the dependent variable is binary, there is no variation in the design, and the hurdle model shows correspondingly no significant effects for the count data. The zero data shows significant relations for the same variables as the OLS model except for veto players, for which the effect is not significant in the hurdle model.

Even though the absolute coefficients are small, the impact of the control variables and especially the country groups are substantial, seeing as the dependent variable is binary. The control variables can play an important part in accounting for IPR specific dispute settlement mechanisms in the PTAs. Veto players, on the other hand, have a comparatively minor negative effect on the IPR DSM provisions in PTAs.

4.3.4 IPR Enforcement Design Analysis

The IPR enforcement design analysis covers three measures as dependent variables: the index IPR general enforcement, the index IPR specific enforcement and the index IPR enforcement. All of them are run in separate models and same as for IPR DSM, the postulated explanatory factor are veto players (*H4.5*; see *Table 23: Overview of IPR Design Features, Explanatory Factors and Hypotheses*).

The regression analysis for both the index IPR general enforcement as well as the index IPR specific enforcement show no significant effects for veto players. Instead, the control variables have a significant effect for both the general as well as the specific enforcement measure. Both regression tables can be found in the appendix (*Appendix 23 Design Regression Table 1: Index IPR General Enforcement (sum), Appendix 23 Design Regression Table 2: Index IPR Specific Enforcement (sum)*).

For the general enforcement index, the effect is significantly positive for democratisation, the average GDP (log), and the geographical distance (log). Hence, PTAs amongst countries that score higher on the Polity 2 index and are considered to be more democratic also include more general enforcement provisions. The expected effect on log(index IPR general enforcement) by a one-unit increase in the average GDP amongst PTA members is *0.152* holding all other variables constant, respectively *0.366* for geographical distance. Interestingly, the effect of the geographical distance is also positive for the zero data of the two-stage model, showing that the log odds of being an excessive zero increase by *1.113* for every increase in the geographical distance (log). This means that the geographical distance, on the one hand, increases the odds of PTAs not including any general IPR enforcement provisions. On the other hand, a greater distance amongst PTA members that are not in the excess zero group increases the number of general IPR enforcement provisions.

The effect of the control variables is significantly negative for countries with a high increase of patent protection. The expected change in log(index IPR general enforcement) for a one-unit increase of countries with a high increase of patent protection is *0.361* holding all other variables constant. Thus, a PTA includes a little less general IPR enforcement provisions if Brazil, China, India or Mexico are part of the agreement.

For the specific enforcement index, the effect is significantly positive for the classic IP leaders, the average GDP (log), GDP per capita (log) and the geographical distance (log). The last two are only significant for the ordered probit model and the first stage of the two-stage model. This implies that GDP per capita and the geographical distance mainly impact the decision if specific IPR measures are included in the PTA, yet have no significant effect on how many specific enforcement provisions are included (not significant for count data). The classic IP leaders, on the other hand, have a significant effect only for the count data stage of the two-stage model and impact how many specific enforcement provisions are included. GDP shows a significant effect for the ordered probit and both stages of the two-stage model, and thus positively effects the decision to include specific enforcement provisions as well as how many provisions.

Although veto players show no significant effect for the general nor the specific enforcement index, they have a significantly negative effect for the combined index of general and specific enforcement. The OP model in *Table 50* shows that every additional veto player decreases the odds ratio of overall IPR enforcement by *-0.023* ($p<0.05$). The effect of veto players on enforcement provision is significantly negative, yet as the estimate is very small it is not the best predictor for IPR enforcement provisions in PTAs.

All of the control variables show a higher effect, both on the significance-level as for the size of the estimates. Democratisation, classic IP leaders, new IP producers and developers, the average GDP (log), the average GDP per capita and the average geographical distance all positively affect the index IPR enforcement. The only negative impact is observed for countries with a high increase in patent protection. This effect is also observed for the index IPR general enforcement, yet is more pronounced when taking into consideration all of the IPR enforcement provisions by regressing the index IPR enforcement (*-0.502*).

Table 50: Design Regression – Index IPR Enforcement (sum)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Veto Players			
Veto players (sum)	-0.023. (0.013)	0.005 (0.011)	-0.016 (0.017)
Control Variables			
Democratisation (Polity 2) (mean)	0.071*** (0.013)	0.028 (0.02)	0.09*** (0.015)
Classic IP leaders	0.217 (0.177)	0.404* (0.18)	-0.176 (0.226)
Countries with a high increase of patent protection	-0.502** (0.158)	0.221 (0.199)	-0.553** (0.183)
New IP producers and developers	0.375* (0.146)	0.148 (0.161)	0.44* (0.186)
ln GDP (mean)	0.224*** (0.049)	0.195*** (0.056)	0.136* (0.057)
ln GDPpc (mean)	0.214** (0.07)	0.086 (0.088)	0.296*** (0.081)
ln Geographic distance (mean)	0.053 (0.06)	0.37*** (0.082)	-0.096 (0.068)
Intercept	–	-8.224*** (1.2)	-5.758*** (1.089)
log(theta)	–	0.862*** (0.255)	–
Model	m14cop	m14chnb	m14chnb
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	573	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The analysis shows that the veto players have a significantly negative effect on IPR enforcement. However, the effect has very little impact due to its low estimates. The control variables can explain more of the variance of enforcement variables in a significant manner than the veto players measure.

4.3.5 Summary of Design Analysis

The design analysis has shown that all of the independent variables play a significant role in explaining the IPR design features. The most distinct and significant effects on the general IPR features have the domestic interest variables, whereas for the stringent IPR measures the highest impact additionally to the domestic interests is observed for the economic power asymmetry variables. The analyses for the IPR dispute-settlement mechanism and IPR enforcement show that veto players have a significant effect, yet that the control variables explain a larger share of the IPR DSM respectively IPR enforcement design feature. *Table 51* lists the postulated hypotheses and shows the relation found in the regression analysis.

Table 51: Conclusion Overview for the Design Hypotheses

Theoretical Argument	Hypotheses		Proposed Relation	Statistical Relation
Economic Power Asymmetry	H1.1	The higher the economic power asymmetry between PTA members, the more stringent IPR provisions are included in PTAs.	Positive on stringent IPR	Positive/ negative
	H1.2	The higher the economic power asymmetry between PTA members and the existence of substantial tariff commitments in the PTA, the more stringent IPR provisions are included in PTAs.	Positive on stringent IPR	Positive/ negative
	H1.3	The higher the economic power asymmetry and the financial commitments between PTA members, the more stringent IPR provisions are included in PTAs.	Positive on stringent IPR	Positive/ negative
Political Pressure	H2	If one of the PTA members are listed in the Special 301 report, the more stringent IPR provisions are included in PTAs with the US.	Positive on stringent IPR	Negative (positive for subset of US PTAs)
Domestic Interests	H3.1	The stronger the domestic IPR exporting interests are among PTA members, the more likely the PTA includes stringent IPR provisions.	Positive on stringent IPR	General IPR: positive/ negative Stringent IPR: positive/ negative
	H3.2	The stronger the domestic IPR interests are among PTA members, the more likely the PTA includes stringent IPR provisions.	Positive on stringent IPR	General IPR: positive/ negative Stringent IPR: positive/ negative

Theoretical Argument	Hypotheses		Proposed Relation	Statistical Relation
Veto Players	H4.1	The more veto players there are among the PTA members, the more general IPR provisions are included in the PTA.	Positive on general IPR	Negative
	H4.2	The more veto players there are among the PTA members, the fewer stringent IPR provisions are included in the PTA.	Negative on stringent IPR	Positive/ negative
	H4.3	The fewer veto players there are among the PTA members, the clearer the trend towards a maximum or minimum standard of IPR protection.	Negative on general IPR/ stringent IPR	General IPR: negative Stringent IPR: positive
	H4.4	The more veto players there are among the PTA members, the fewer specific IPR DSM provisions are included in the PTA.	Negative on IPR DSM	Negative
	H4.5	The more veto players there are among the PTA members, the fewer IPR enforcement provisions are included in the PTA.	Negative on IPR enforcement	Negative
Endogeneity	H5.1	The deeper the overall PTA, the more stringent IPR provisions are included in the PTA.	Positive on stringent IPR	Positive
	H5.2	The deeper the market access provisions are in the PTA, the more stringent IPR provisions are included in the PTA.	Positive on stringent IPR	Positive
	H5.3	The more IPR enforcement provisions are in the PTA, the more stringent IPR provisions are included in the PTA.	Positive on stringent IPR	Positive
	H5.4	The more specific IPR enforcement provisions are in the PTA, the more stringent IPR provisions are included in the PTA.	Positive on stringent IPR	Positive
Regime Preference	H6.1	The lower the commitment to IPR multilateral coherence in PTAs, the fewer IPR provisions are included in PTAs.	Positive	General IPR: positive Stringent IPR: positive
	H6.2	The higher the commitment to IPR multilateral coherence in PTAs, the fewer stringent IPR provisions are included in PTAs.	Negative on stringent IPR	Positive
	H6.3	The higher the commitment to IPR multilateral coherence in PTAs, the more stringent IPR provisions are included in PTAs.	Positive on stringent IPR	Positive
	H6.4	The lower the commitment to IPR multilateral coherence in PTAs, the more stringent IPR provisions are included in PTAs.	Negative on stringent IPR	Positive

Theoretical Argument	Hypotheses		Proposed Relation	Statistical Relation
Path Dependency	H7.1	If the IPR provisions have been included in a previous PTA of at least one PTA member, the more likely these provisions are to be repeated in follow-up PTAs.	Positive	General IPR: positive/ negative Stringent IPR: positive/ negative
	H7.2	If general IPR provisions have been included in a previous PTA of at least one PTA member, the more likely these general provisions are to be repeated in follow-up PTAs.	Positive on general IPR	Positive/ negative
	H7.3	If specific IPR provisions have been included in a previous PTA, the more likely these specific provisions are to be repeated in a later PTA.	Positive on stringent IPR	Positive/ negative

Economic power asymmetry shows a high effect on the various stringent IPR measures except for the index IPR tangible scope, i.e. the number of IPR forms covered by specific provisions. For *H1.1* – concerning the first two *epa* variables – the effects are inverted for the GDP asymmetry and the GDP per capita asymmetry. GDP asymmetry has a significantly positive effect on specific IPR provisions and a negative one on IPR multilateral coherence. This means that PTAs indeed include more specific IPR provisions with an increase in the economic power asymmetry, yet the effect is inverted for commitments on IPR multilateral agreements. Moreover, the GDP per capita asymmetry has a significantly positive effect on all indexes except the index IPR specific, where it has a negative effect, and the index IPR tangible scope, which is not significantly affected by the *epa* variables. *H1.1* can thus be cautiously accepted, as it has mostly positive effects on stringent IPRs.

The analysis of the variables for *H1.2* shows mostly significantly positive effects for GDP asymmetry and only significantly negative effects for GDP per capita asymmetry. The interaction term of GDP asymmetry and substantial tariff cuts only has a negative effects on the number of specific IPR commitments in PTAs. The effect is only significantly positive for specific provisions on domain names. This is in so far astonishing, as the trade-off effect of substantial tariff cuts in a combination of pressure by an economically more powerful state is often used as a theoretical argument why PTAs include specific IPR or even TRIPS-plus provisions. Yet the regression analysis shows that the effect is inverted. However, the positive effect of the combination of GDP asymmetry and substantial tariff cuts proves true for specific IPR enforcement provisions and IPR multilateral agreements. *H1.2* can thus be accepted for the interaction term including GDP asymmetry leaving aside the inverted effect on the index IPR specific, and *H1.2* is overturned for the GDP per capita asymmetry.

H1.3 also shows that GDP asymmetry and GDP per capita asymmetry result in inverted effects for the interaction terms. Firstly, the interaction term including FDI and GDP asymmetry shows a significantly negative effect for specific IPR as well as specific IPR enforcement provisions, as well as some minor positive effects on specific IPR forms. This means that an increase of GDP asymmetry in combination with FDI has a negative impact on specific IPR commitment in PTAs, which goes against *H1.3*. Yet, the effect is significantly positive for the same interaction term with GDP per capita asymmetry.

Secondly, for the official development assistance and official aid received interaction term with GDP asymmetry, there is a significantly negative effect on IPR enforcement and a positive effect on IPR multilateral coherence. Again, the impact of GDP per capita asymmetry is opposed to the one of GDP asymmetry.

Thirdly, GDP asymmetry in combination with the share of DAC aid received by PTA members of the total DAC aid received has a significantly negative effect on specific IPR as well as specific IPR enforcement and a significantly positive effect for TRIPS-plus provisions. Thus, PTAs that have an increased effect for this interaction term are more likely to include TRIPS-plus provisions and less likely to include specific IPR provisions including such on enforcement. Overall, *H1.3* can only be partially accepted.

As the last point on economic power asymmetry, it is necessary to bear in mind that the data availability for the economic power asymmetry measures is fragmented and one-third of the coded PTAs are lost due to missing data and therefore not represented in the analysis.

Political pressure shows for the majority of measures for stringent IPR a significantly negative effect and, thus, *H2* postulating a positive effect is overturned. However, by looking at the subset of the 22 US PTAs, the effect becomes positive. Seemingly, the US can use its political pressure to increase the number of stringent IPR provisions in its PTAs. As the number of observations is too small for the US subset, they have no statistical significance but indicated that it might be of interest to test the political pressure asserted by other countries.

Domestic interests have a significant effect on the IPR content of PTAs. The exporting interests show both positive as well as negative effects on the various general and stringent IPR indexes. The imports of *mhtp* by PTA members as a positive effect on the number of general and specific IPR forms and specific IPR enforcement covered in PTAs, whereas for *ltp* imports by PTA members there is a significantly negative effect on the references to IPR multilateral agreements and TRIPS-plus provisions. The more market share the PTA members hold in the respective technology-intensive import groups, the more likely the PTA does not include more tangible IPR and specific IPR enforcement provisions. Namely, with a higher share of the total *htp* imports by PTA members, the PTA is more likely to include fewer tangible IPR commitments, where for *mhtp* and *ltp* imports the PTAs are less likely to include specific IPR enforcement provisions. It seems that with a larger share of PTA members *mhtp* and *ltp* imports, the PTA members see less need for including specific IPR enforcement provisions in their PTAs. This might indicate, that they already enjoy sufficient IPR protection in regards to enforcement. However, there is also a significant positive effect of the share of *mhtp* and *ltp* imports by PTA members: the higher their share is, the more TRIPS-plus provisions are included in the PTA. Hereby, it can be assumed that the PTA members further increase the protection for their already substantial market shares by heightening the TRIPS-plus protection through PTAs. Hence, *H3.1* can be accepted for certain measures and has to be overturned for others.

H3.2 looks at domestics interests more broadly and finds significantly positive as well as negative effects on general and stringent IPRs. The more resident applications were made on patents and trademarks, the more stringent IPR provisions can be found in PTAs. This effect is inverted for the cumulative resident applications for industrial designs. Where the PTA members hold a large share of applications, the effects on stringent IPR are mostly negative and PTAs include fewer stringent IPR provisions. The number of researchers in R&D shows a positive effect on references to IPR multilateral agreements and TRIPS-plus provisions in PTAs, whereas the opposite impact can be observed for the PTA members expenditure on R&D. Thus, there are certain domestic interests, for which *H3.2* can be accepted and others, for which it has to be rejected.

Veto players have both a significant effect on general as well as stringent IPR. The effect for general IPR is significantly negative and *H4.1* assuming a positive effect is overturned. For stringent IPR, the relation towards veto players is ambiguous, and *H4.2* can be partially accepted. Veto players have a significantly negative effect on the scope of tangible IPR scope provisions (only for the *epa* model) and on the level of IPR multilateral coherence mentioned in PTAs. For the other stringent IPR measures, the regression tables show mixed results, i.e. both significantly positive or negative effects. For specific IPR enforcement provisions, *H4.2* is overturned as the regression analysis shows positive effects. This is contrary to the results observed in the reduced model focusing on veto players (*4.3.4 IPR Enforcement Design Analysis*). *H4.3* assumes that fewer veto players result in a more extreme effect on general or stringent IPR, whereby the effect can be positive or negative. Yet, the results only show marginal effects of veto players on both the general and stringent IPR variables, overturning *H4.3.*

The effect on the IPR DSM is as postulated significant and negative, yet on a low scale and surpassed by the effect of the control variables on the IPR DSM. Nevertheless, *H4.4* is accepted based on the significant results of the regression analysis.

For general and specific IPR enforcement, there is no significant effect of veto players, yet for the overall enforcement, veto players have a significantly negative effect. Same as for the IPR DSM variables, the effect of the control variables is more pronounced than the one of the veto players. *H4.5* can thus be accepted for the overall IPR enforcement measure.

Endogeneity has a predominately positive effect on the stringent IPR content. Only for the more detailed analysis considering the IPR forms and TRIPS-plus categories, the effect turns significantly negative. *H5.1* and *H5.2* can both be accepted for most stringent IPR measures, yet not for all IPR forms. For example, the theoretical trade-off between substantial tariff cuts in turn for TRIPS-plus provisions on patents such as a longer term of protection is inverted. Those PTAs including substantial tariff cuts are significantly less likely to include TRIPS-plus provisions on patents, overturning *H5.2* for patents. However, the trade-off is positive for geographical indications and confirms *H5.2* for geographical indications. The endogeneity effect is consistently positive for both the IPR enforcement measures and, hence, *H5.3* and *H5.4* are accepted. Overall, endogeneity has a positive effect on stringent IPR.

Regime preference has a significantly positive effect on general as well as stringent IPR and, hence, *H6.1* can be accepted for both general as well as stringent IPR. *H6.2* and *H6.4* postulate a negative regime preference effect and are, therefore, are overturned. *H6.3* assumes a positive regime preference effect and can also be accepted. The results thus suggest that countries do not prefer one fora of IPR regulation over the other and if they commit to IPR multilateral agreements in PTAs, they simultaneously also increase the general as well as the stringent IPR content of the PTA.

Path dependency has significantly positive and negative effects on both general as well as stringent IPR. *H7.1* concerns general and stringent IPR, and for the latter refers to the models *pdg*, *pds* and *pdtp*. For these models, path dependency is attributed to the learning from own PTAs and not PTAs by non-PTA members. *H7.2* assumes that the effects can especially be observed for general IPR provisions and is therefore based on the general IPR analysis. *H7.3* assumes that path dependency can take beyond PTA-members PTAs and only concerns the stringent IPR regression models looking at the path dependency worldwide: *pdwss*, *pdwstp*, *pdwfs* and *pdwftp*.

All three hypotheses can only hesitantly be accepted. Firstly, the effects are mostly marginal, i.e. show low estimates that are surpassed by more influential, significant effects in each model. Secondly, the effects show no consistent relation, i.e. are both positive as well as negative, depending on the measure for path dependency. Countries thus seem to learn from their own previous policies as well as those made by other countries. The effect of this path dependency can go either way: either countries prefer to include these provisions again resp. as well, or they refrain from including them in their PTAs.

Interestingly, the analysis of the binary IPR tangible scope variables and the additive TRIPS-plus categories shows that the effects are often not one-directional. For instance, a path dependency effect from copyrights has not only (if at all) an effect on copyright provisions. For the analysis of stringent IPR, the effects of path dependency from worldwide provisions and more specifically TRIPS-plus provisions shows the most pronounced and significant effects (*pdwstp* resp. *pdwftp* models). Generally, the path dependency is more distinct for the PTAs that have already entered into force (*pdw f* models), yet not for the path dependency effects on the TRIPS-plus categories, where the models for the PTA signature show more distinct effects. Hereby, time might play an important factor, as some of the TRIPS-plus heavy PTAs have not yet entered into force.

Even though there are no hypotheses postulated on the ***control variables***, their effects are highly significant across most models and must be reflected as well. For general IPR, their estimates often surpass the ones of the tested explanatory factors.

Average democratisation has a significantly positive effect on the tangible IPR provisions and IPR multilateral agreements, whereas the effect on IPR enforcement is mixed and for TRIPS-plus provisions negative. This means that the more democratic the PTA members are, the more likely they include specific provisions on IPR forms and references to other IPR multilateral agreements, some of them might even include IPR enforcement measures, yet they are less likely to include TRIPS-plus commitments.

Classic IP leaders – US, EU, EFTA and Japan – have a significantly positive effect on all indexes including the index IPR specific, whereby the IPR multilateral coherence is in some instances also affected negatively. This indicates that if one of these countries is part of the PTA, it includes more on all IPR indexes. Countries with a high increase of patent protection – Brazil, China, India and Mexico – show a more marbled picture. These countries have a positive effect on tangible IPR provisions and IPR multilateral coherence, a mixed effect for enforcement and a negative one for the TRIPS-plus index. Their PTAs are thus likely to contain specific provisions on certain IPR forms and IPR multilateral agreements, might include some specific IPR enforcement provisions, yet are unlikely to include provisions that go beyond TRIPS. New IP producers and developers – Israel, South Korea, Singapore and Taiwan – show a significantly negative effect for tangible IPR provisions, specific IPR enforcement, IPR multilateral coherence and TRIPS-plus measures. If one of these countries is thus a PTA member, the agreement is less likely to score (high) on these stringent IPR indexes.

The average GDP (log) and average GDP per capita (log) often have inverted significant effects, namely for the index IPR specific (positive/ negative), index IPR multilateral coherence (negative/ positive) and the index IPR TRIPS-plus (positive/ negative). For the index IPR tangible, they both show mixed effects, and they both have a positive effect on the index IPR specific enforcement.

The average geographic distance (log) has a significantly positive effect on the specific IPR content and both its sub-indexes, index IPR tangible scope and IPR specific enforcement. This means that the further apart PTA members are, the more likely they will include specific provisions in their PTAs. However, the average geographic distance (log) also has a significantly negative effect on the index IPR multilateral coherence and IPR TRIPS-plus. This means that a greater geographical distance between PTA members makes it less likely that their PTAs contain references to IPR multilateral agreements or TRIPS-plus provision.

Conclusively, the GPE theories provide adequate arguments for the analysis of IPRs in PTAs, yet there might be a need to add on the operationalisation of the variables as many of the control variables show a consistently significant effect on the design. Notwithstanding, the most explanatory power is observed for the variables of economic power asymmetry and domestic interests derived from the GPE theories of realism, liberalism, social-constructivism and modern marxism (see *2.2.2 Global Political Economy Theories*).

4.4 Design: Conclusion

The design analysis aims to show that there are measurable factors besides negotiation circumstances that shape the design of a PTA. Based on the GPE theories, I looked at the seven explanatory factors of economic power asymmetry, domestic interests, political pressure, veto players, endogeneity, regime preference and path dependency.

Next to accounting for several explanatory variables, I argue that PTA design should not be considered as being one-dimensional. Preferably, the PTA design includes multiple measures that can be affected to a different extent by the explanatory factors. Thus, I divide my data into two broad categories of general IPR and stringent IPR and operationalise each category by using several subsets. For example, the categories look separately at the IPR content, IPR scope, IPR enforcement and IPR multilateral coherence.

The results of the regression analysis show that all of the tested factors have a significant effect on the design of IPRs in PTAs, yet some of the tested factors show a fairly low impact whilst others have a more substantial effect. Overall, the most distinct effects can be observed for the variables of economic power asymmetry and domestic interests. As repeatedly argued by realism theory, the analysis shows that economic power asymmetry between PTA members has a significant impact on the inclusion of specific IPR provisions in PTAs. And as theory suggests, the effect is often positively correlated with a trade-off. Thus, when a higher economic power asymmetry exists between countries and the PTA includes substantial tariff cuts, the PTA is also more likely to include stringent IPR commitments. Interestingly, the effect of domestic interests on IPRs seems indeed not to focus on high-technology products. The most pronounced effects for domestic interest were found for medium-high-technology products (negative effect on general IPR design and TRIPS-plus provisions) and medium-low-technology products (positive effect on general IPR design and TRIPS-plus provisions). However, this effect is generally not observed for stringent IPR, where most specific IPR features are impacted positively by domestic interest on medium-high-technology products. The differentiation of IPRs across sectors and levels of technology-intensiveness is thus necessary and should be pursued further.

Moreover, the analysis shows that the impact of the explanatory variables varies depending on the regressed subset of IPR categories. For instance, veto players show a significantly positive effect on the IPR specific enforcement and TRIPS-plus measures, whereas their effect is significantly negative on IPR multilateral coherence. It is thus indeed necessary to capture multiple dimensions of the PTA design in order to explain it. Advanced studies could even acquire a more detailed coding of IPR design features or apply a similar approach to other agreement features. This would assist in reflecting the underlying mechanisms of more detailed respectively other PTA design features.

Further, the results show that not all of the postulated effects occur in the anticipated direction. Hence, it is necessary to further investigate the mechanisms behind the design of IPRs in PTAs. Future research should take a deeper interest in the evolution of PTA design and see if there are additional explanatory factors as well as test the here presented factors for other design features. As economic power asymmetry factors and domestic interests play the most pronounced role in explaining IPR design features, these factors should also receive a particular focus in advanced studies.

Moreover, the analysis also shows a consistent effect of path dependency and it might be worthwhile to analyse the copy-paste and diffusion on IPRs in PTAs in more detail. Hereby, on can build on the research by Allee and Elsig (n.d.) and ideally enhance it with domestic IPR regulation to enrich the path dependency discussion.

Overall, by understanding the design better, research assists in giving the discourse an evidence-based foundation instead of relying predominately on theoretical assumptions and case-specific arguments. Furthermore, the existing theoretical arguments on IPR could be analysed in more detail. For instance, future research could also analyse another uniqueness of IPR commitments: IPR concession can only be used as a bargaining chip in one PTA, whereas preferential tariffs can be granted to multiple trading partners (Fink 2011, 389). Such research can build on my analysis and conduct a case study on the PTAs of one country or a group of countries and look at the consistency of their IPR design features for their subset.

> "*In the typical grand bargain under a North-South PTA, the developing country makes a non-preferential commitment on IPRs in exchange for preferential market access to northern markets for agricultural or manufactured goods. The latter, however, may be temporary because the value of trade preferences diminishes if the northern PTA partner signs additional PTAs with third countries or reduces tariffs on an MFN basis in the context of a multilateral trading round*." Fink (2011, 389)

Correspondingly, the focus of such a study could lie on developing countries, which have already signed multiple agreements, and compare their IPR content as well as possible connected concessions. Aside from focusing on a subgroup of PTAs and performing a more in-depth analysis, future research can also analyse certain IPR areas in PTAs in more detail. For example, the connection between IPR and investment is only marginally covered by my analysis and could be expanded on further. So, another topic not covered by my analysis is the diffusion resp. copy-pasting of PTA texts over time and countries. This could shed some light on design trends over time and maybe even best-practice IPR provisions.

In addition to enhancing the design analysis, the data and results can be used to look at the other end of PTA analysis: the effects of PTA design. I start this research in the following chapter and conduct an analysis of the legal-institutional and economic effects of the IPR design in PTAs.

Chapter 5: Effects of Intellectual Property Rights in PTAs

The effect analysis aims to provide answers to the questions if IPRs in PTAs have an effect and to what extent the variation in the IPR design features matter.

Already, the effect of IPRs is difficult to measure. According to the rationale of IPRs (see *Figure 4: Rationale of IPRs*), the protection of intellectual property serves several goals and, for instance, more stringent IPR protection supposedly increases innovation as well as FDI. Yet, FDI and innovation, as well as the other factors target by IPR regulation, are not merely influenced by IPR regulations. Similarly, the effects of PTAs usually affect areas that are not solely influenced by PTAs. Thus, the effect analysis of IPRs in PTAs is hampered by biases related to endogeneity and the allocation of adequate instruments, which means that the overall results need to be qualified regarding the impact of IPR design in PTAs on domestic factors. Nevertheless, there should be some patterns visible, especially for analysis with my dataset, which provides a multitude of observations for various countries over time. After all, the design of IPRs in PTAs should show some of the postulated effects of IPR, as otherwise, there would be no reason for any IPR design variations across PTAs. In the next few paragraphs, I briefly summarise the focus of research of the effects of PTAs, IPRs, and IPRs in PTAs, highlight what I find to be the main hurdles for their analysis and conclude by my research approach for the effect analysis.

For the analysis of the effects of PTAs, there already exist plenty of literature with a strong focus on the effects of trade agreements on trade flows. Hereby, the most common statistical approach is applying a gravity model of trade to analyse the effect of PTAs on trade flows (see Kepaptsoglou, Karlaftis, and Tsamboulas 2010 for an overview of previous economic studies). In brief, the gravity model of trade assumes that the trade volume between trading partners is based on their economic size and the geographic distance between them. The model can be enhanced depending on the research focus and common denominators added to the gravity model are the existence of trade agreements, a common language between trading partners, and their colonial relationships (Kepaptsoglou, Karlaftis, and Tsamboulas 2010). There have also been more recent studies, expanding the focus of effects of PTAs (see Baccini 2019 for an overview of effects of PTAs). For example, there are studies analysing the effects of PTAs on FDI, welfare and reforms in developing countries (Baccini 2019).

In general, the effect analysis of PTAs encounters two main problems: there is limited knowledge about the ex-ante and ex-post domestic regulation. For most studies, there is no systematic data available across time on the domestic regulation before the PTA was signed (ex-ante) as well as after the PTA has entered into force (ex-post).

The lack of ex-ante information is in so far problematic as the PTA design features most likely cover not only new regulation but also repeat existing regulations, for at least one PTA member. Thus, the effect should only be visible for those PTA members, which have to change their status quo due to the PTA. So far, research generally assumes that PTAs are exogenous and that observable effects can be attributed to the PTAs resp. PTA design for all countries. Most studies analysing the effects of PTAs make no differentiation between countries having already in place similar provisions in the PTA domestically before the PTA entered into force and rather assume that the PTA includes novel provisions for all PTA members. This assumption might be valid for tariffs and other preferential PTA features, yet is problematic for IPRs in PTAs. For instance, the US PTAs generally repeat IPR provisions already implemented domestically in the US. One the one hand, this repetition of IPR standards should not lead to any effects for the US as they are not required to change their domestic IPR regulation based on the PTA. On the other hand, the PTA partners are more likely to have to adapt their domestic regulation based on the IPR provisions in PTAs with the US, and the postulated positive effects of IPRs in PTAs are expected to be observable for these countries.

The ex-post issue describes the missing information on the implementation of the PTA regulation. The basic assumption with PTAs is that by the time of entry into force or the transition period determined in the PTA, the regulations are implemented into domestic law. However, there is no systematic data matching PTA provisions in regards to domestic implementation. Of course, this is not only a problem for PTAs, but multilateral agreements in general. For example, even after TRIPS entered into force, not all of the countries had implemented the agreed-upon regulations:

> *"From 1995, representatives of leading multinational pharmaceutical, agrochemical, seed, entertainment, manufacturing, and software companies called on their respective governments in the United States. European Union, and Japan to ensure swift and full implementation of TRIPS, to eliminate the loopholes and ambiguities in the Agreement, and to ensure that its interpretation by developing countries protected their interests. Industry representatives worried that actions in one developing country might influence others."*
> Deere (2009, 114)

According to Deere (2009, 151 et seqq.), there are two key factors influencing the implementation of TRIPS: ideational as well as economic pressure. On the one hand, there was ideational pressure to implement TRIPS, for instance, through knowledge communities (media, experts, politicians, etc.), by strategically framing and counter-framing the debate on IPR regulation, as well as through monitoring resp. surveilling the implementation of TRIPS (e.g. through the "Special 301 Report"). On the other hand, there was economic pressure exerted by developed countries in the form of trade sanctions, withdrawal or reduction of aid, and the negotiations of new trade agreements to reinforce TRIPS as well as go beyond it. Or in certain PTAs, countries specifically are required to implement resp. require the implementation of the PTA provisions before the PTA enters into force. For example, the US requires that PTA members adapt their domestic IPR regulation according to the IPR provisions in the PTA in a so-called certification process before the PTA enters into force (Biadgleng and Maur 2011, 9).

Due to the lack of information on these ex-ante and ex-post factors, I will simply assume that the PTAs change the status quo of at least one PTA member and that countries implement the PTA provisions by the time of entry into force respectively the extensional deadline defined in the PTA.

Heretofore, there have also been studies analysing the effects of IPRs. Most studies focus on the effect that IPRs have on FDI, licensing and trade flows (for example Fink and Primo Braga 2005; Maskus and Penubarti 1995; Smith 1999). The results of these studies are, however, highly ambiguous. For instance, some studies of the effect of IPR on FDI find no effect, others find positive effects or even negative effects of higher IPR protection (see Fink 2011; Maskus 2005). One of the caveats with the analysis of IPR is that there is no comprehensive data on the domestic IPR regulation. There exist measures quantifying the level of protection, for example, for patents, whereby the most used one is the Ginarte-Park index (Ginarte and Park 1997). Yet, the index only provides data ranging from 1960-2005, meaning that the rise of IPRs in PTAs cannot be matched to the index. Moreover, patents are only one off the elven forms of IPR covered by PTAs, and general statements about the effects based on the analysis of patents might be oversimplifying the effects.

Another issue of the analysis of the effects of IPRs is that the effects are expected to be non-linear. This means that there is a tipping point for intellectual property regulation after which the previously positive effects of more stringent IPR protection are reversed.

For instance, too stringent regulation can restrict developing countries in reverse engineering or imitating innovation in other manners and "*thereby making technological catching up more difficult than before*" (United Nations Conference on Trade and Development (UNCTAD) 2010, 14). For example, the OECD study "Pharmaceutical innovation and access to medicines" (OECD 2018) lists among other issues that there has been a steady increase of medicine prices and that one of the main principles to correct the system is to foster competition for goods with and without a valid patent. The OECD study shows that the incentive to innovate has its limits, especially regarding the effects on social welfare. Besides the high costs of the health systems partially due to the high prices for patent-protected medicine and restrictive exhaustion regimes forbidding the parallel importation of medicine, the innovative focus of pharmaceutical companies lies on those diseases with many possible patients, whilst rare diseases are too unlucrative to invest in. Albeit this being a rational decision for companies, the implications on the overall market and society are not optimal. Some fields deemed unlucrative such as antibiotics or dementia are lacking an appropriate amount of R&D reflecting the social importance of these fields (OECD 2018, 90 et seqq.). Even more, for rare diseases, there is very limited R&D, and if there are new treatments available, they tend to be very cost intensive. The discrepancy between the rationale of IPR and the pharmaceutical sector becomes even more apparent when looking at the profitability of the pharmaceutical sector. The OECD study shows that compared to other R&D intensive industries, the pharmaceutical one has remained profitable: "*Since 2007, the R&D- based pharmaceutical industry has consistently made economic profits and has been more profitable than some other R&D-intensive industries, such as aerospace and defence, information technology (IT) hardware, or other healthcare technology*" (OECD 2018, 94). Consequently, less stringent patent protection should be economically manageable for pharmaceutical companies and might be beneficial for competition, innovation and social welfare.

Moreover, the historic developments show that there might not be a single approach of IPR regulation for all countries. For example, Japan has gone from "imitator" to "improver" to "inventor" and along the way increased its patent regulation. The counterexample is South Korea, which imposed a very stringent IPR standard as a developing country and has had a highly positive economic development (Goldstein et al. 2009). Besides, the roles can change over time. China used to be a leader in manufacturing porcelain with its typical blue and white colour set, which soon was copied by Japan and European countries. Nowadays, these products are often considered to be a national specialty such as

Spanish and Portuguese tiles (“Azulejos”), Dutch porcelain objects and figures (“Delft-ware”; “Delft pottery”) or German porcelain (“Meissen China”) (Finlay 1998). And in more recent history, China has been accused of imitating products, then implemented substantive IPR regulations, followed by more rigours IPR enforcement, and nowadays is one of the leading patent applicants. Even these country examples are ambiguous, as there are countries that seem to have benefitted from early on stringent IPR protection such as South Korea and others that have built their initial growth on low IPR regulation such as Japan. Furthermore, some countries are still reluctant to protect IPR areas, where their industries do not have a comparative advantage. In the EU, many countries fought a more stringent copyright protection, and Switzerland still allows downloading and streaming of copyrighted material, as the main negative impact of piracy does not impact the domestic industry. It thus an reasonable argument that countries disguise their interest as globally beneficiary IPR provision. As shown in the design analysis chapter, domestic interest of and economic power asymmetries between the PTA members drive most of the IPR regulation in PTAs.

Additionally to the issues faced for the effect analysis of PTAs respectively IPRs, there is another major difference of the analysis of the effects of IPRs in PTAs compared to other PTA effect measures: the MFN treatment of IPRs in PTAs. The IPR provisions in PTAs underlie the MFN principle, and IPR commitments are granted not only to the PTA members, but across-the-board because PTA members are obliged to extend the PTA commitments to all (non-PTA) WTO members. This means that IPR provisions in PTAs are not preferential and can be used as a bargaining chip only once (see also the elaboration on IPR provisions being used as a bargaining chip for *hypothesis 1.2* in the design chapter). This includes that a commitment in a PTA is supposedly implemented into domestic law once the PTA enters into force. By including the same commitment in another PTA, the countries make a non-commitment, as they repeat the existing status quo (Biadgleng and Maur 2011, 11). This makes the effect analysis difficult, as not all IPR commitments in PTAs change the domestic status quo and henceforth, should have no domestic effect.

Consequently, there have only been few studies analysing the effects of IPRs in PTAs. The difficulty in statistically allocating a connection between the effects of PTAs resp. IPRs and their anticipated factors such as growth and FDI is amplified through the linkage of IPRs in PTAs, let alone identifying causalities. Hereby, it is even harder to distinguish if it is the effect of IPRs in PTAs, the PTA itself or other factors that lead to a change in the analysed factors. Most of the few studies on IPRs in PTAs use a dummy variable for PTAs including IPRs (or not) and do not go further into detail on the design aspects. Only recently, there have been some studies using PTA design as an explanatory variable. The most substantial study by Maskus and Ridley (2016) analyses the effect of IPRs on PTAs on the aggregate trade flows of PTA members, and find that the IPR design of PTAs indeed affects the sectoral trade of PTA members. Their study looks at the PTAs of the US, EU and EFTA and their content of specific patent, copyright, trademark and enforcement provisions. However, their treaty sample is relatively low, with 50 PTAs out of which 24 include specific IPR provisions (Maskus and Ridley 2016, 5).

I build on these previous studies on the effects of IPR, PTAs, and IPRs in PTAs, and use my comprehensive dataset to make some further differentiation between the effects of the IPR design factors. In the following two subchapters, I focus on two effect measures in order to analyse if IPRs in PTAs respectively their design matter, namely legal-institutional effects and economic effects.

The legal-institutional effect analysis focuses on the concrete legal consequences of PTAs and looks into issues of the PTA analysis: do countries make commitments in PTAs, which require them to change their status quo? If they make such commitments, do they follow up on them and change their domestic regulation? Can these decisions to comply with the IPR commitments in PTAs be explained by PTA design factors? Or might these effects be driven by PTA members exerting their power to increase IPR protection? The economic effects, on the other hand, aim to find trends for the rationale of IPRs: Does more stringent IPR protection in PTAs show any of the postulated positive effects? Do the IPR forms matter for the effect analysis? Is there an obvious tipping point of IPR protection such as TRIPS-plus regulation?

However, as there has not been a substantive amount of research on the effects of IPR in PTAs, the two subchapters should be considered as fundamental research and hold no claim of comprehensiveness. Rather, the idea is to point out what the PTA design data and analysis can be used for, and at best, will be used as building blocks for further research.

5.1 Legal-institutional Effects

The analysis of the legal effects of IPRs in PTAs encompasses various effects, which can be observed, for example, for domestic legislation, the outcome for those addressed by the regulations, the judicators, and the intended and unintended impact on society. As such factors would require substantial additional data collection of domestic factors, I refrain from covering them in my research. However, there is a highly specific, yet comparably feasible measure of legal effects that I can cover based on my data on IPRs in PTAs and some additional domestic data. This particular legal effect focuses on the references to IPR multilateral agreements in PTAs.

As shown in the data and design chapter, the commitments to IPR multilateral agreements play a significant role in PTAs. My dataset shows that 63% of the PTAs signed after TRIPS include references to IPR multilateral agreements, and out of those signed since 2010 the share rises to 86%. Thus, a vast majority of PTAs signed nowadays contains references to other fora of IPR regulation. And there are new IPR multilateral agreements negotiated as well as existing ones further developed. For example, in 2019 the EU and other countries such as Switzerland have announced that they are aiming to ratify another IPR multilateral agreement: the Geneva Act to the Lisbon Agreement (Eidgenössisches Institut für Geistiges Eigentum 2019; Europäischer Rat 2019). The Geneva Act further protects geographical indications and will enter into force after the ratification by five WIPO members, which will be already achieved if a fifth of the EU members ratify it. At the same time, both the EU and Switzerland have signed further PTAs including IPR multilateral coherence commitments, which are not yet covered in my dataset, for example, the PTA between the EU and Japan, or the PTA between Switzerland and Indonesia. These examples show that IPR multilateral agreements, as well as the commitments on them in PTAs, will continue to play an important role for IPR regulation.

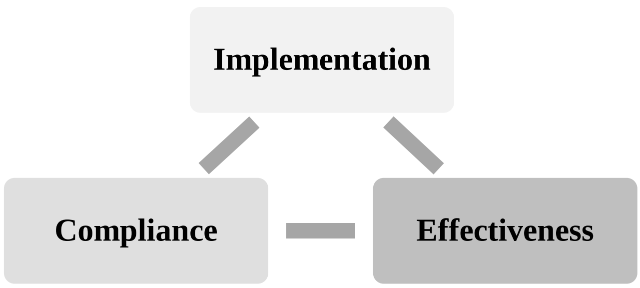
My dataset provides insights on which IPR multilateral agreements are included in PTAs, to what extent and by which countries, and the subsequent step is to analyse if these PTA provisions have an effect on countries commitments to the IPR multilateral agreements. I refer to the effects of IPR multilateral coherence provisions as the legal-institutional effects, which I define in the subsequent subchapter. I describe the legal theories, apply these theories to the concept of IPR multilateral coherence, derive four hypotheses on the expected legal-institutional effects of the IPR multilateral commitments in PTAs and test them in a regression anlaysis.

5.1.1 Legal-institutional Effects: Theory

The puzzle of why and if countries comply with international law has been of interests not only for legal but also scholars of political scientists and international relation. So far, there has been a variety of theoretical international relations research on the effects of international institutions and international law such as Elsig (2015) and von Stein (2017), yet only few empirical studies of their legal effects.

I derive my theory of legal-institutional effects from the theory of legal effects of international regulations as described by Raustiala (2000), which is due to its lean and straightforward concepts is ideally suited for this kind of fundamental research. According to Raustiala (2000), there are three main concepts describing the legal effects of agreements: implementation, compliance and effectiveness (*Figure 13*).

Figure 13: Legal Effects of International Regulations



Each of these three concepts shown in *Figure 13* describes an effect of international regulations. *Implementation* stands for the conversion of international regulation into domestic law. *Compliance* refers to the relation of the regulation and the behaviour of its addresses, and is given when the norms and specified rules of an agreement are reflected in the behaviour of actors. *Effectiveness* specifies these instances, where the regulation requires a behavioural change and does not merely statutorily regulate the status quo (Raustiala 2000).

Raustiala applies these concepts to the content of regulations. For the case of a regulation by quotas, this would entail analysing if countries implement quotas into domestic legislation (*implementation*), comply with these quotas (*compliance*) and check if these quotas effectively change actors behaviour or simply translate common practice into legal norms (*effectiveness*). Raustiala (2000) stresses that the differentiation between these three concepts is detrimental for the analysis of legal effects, especially if the effects analysis implies causality:

> *"Compliance refers to conformity between behavior and a specified rule. Compliance has many causes, and can be inadvertent, coincidental, or an artifact of the legal standard. Consequently, the sheer fact of compliance with a given commitment tells us little about the impact of that commitment. Effectiveness refers to observable changes in behavior that result from a specified rule. Thus, to say an accord is effective is necessarily to make a causal claim, whereas to say that a state is in compliance with an agreement entails no causal claim."* Raustiala (2005, 610)

For example, when regulation is implemented and the addresses are complying with this newly implemented regulation, one cannot draw a conclusion on the effectiveness of this regulation. If this regulation writes into law the pre-existing behaviour of its addresses, then it is not effective according to the legal effects theory as it is not resulting in a behavioural change of the regulations' addresses. Furthermore, it might very well be that a norm has not been implemented, yet there is already compliance or effectiveness, or both. Thus, the three concepts of implementation, compliance and effectiveness should not be considered as sequential and are not necessary conditions for one another.

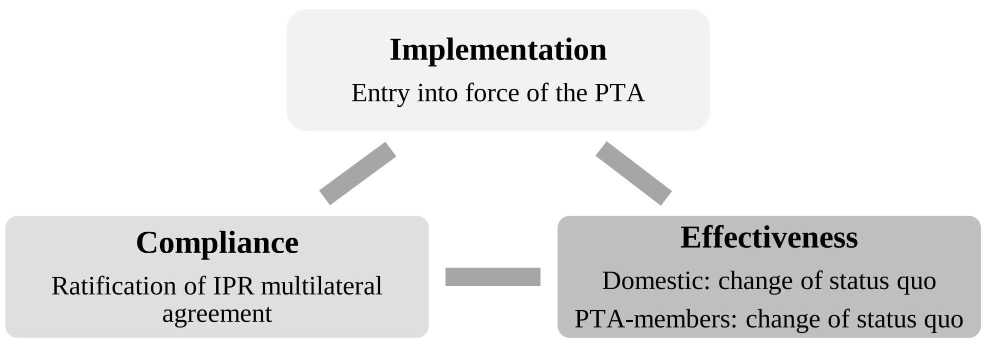
For my analysis of the commitments made to IPR multilateral agreements in PTAs, I simplify Raustiala's concept by focusing on the specific *commitments* made to IPR multilateral agreements and not looking at the *content* of these agreements in PTAs. For example, I apply the concept to the commitment of a country to accede to the Patent Law Treaty, yet I will not analyse the implementation, compliance and effectiveness of the content of the Patent Law Treaty, i.e. the domestic regulation of patents. As I focus on the commitments made in the PTAs towards other legal institutions, I use the term "*legal-institutional effects*".

As described in the beginning, the concepts of international regulations are often used in the analyses of international law. However, some researchers would argue that the terms have a different meanings than described by Raustiala. For example, von Stein (2017) argues that compliance should not be considered dichotomously and rather can be placed on a continuum, whereby the level of compliance with both rules and rulings should be taken into account. Furthermore, von Stein argues that effectiveness is conditional to the PTA, i.e. the domestic changes in the status quo need to be connected to the PTA itself to be labelled as effective. If the compliance is brought on by PTA-exogenous conditions, then the observed effect is not effectiveness, which can only be observed when the PTA changes the domestic behaviour. Von Stein's definition is thus broader for compliance and more restrictive for effectiveness, which hampers their measurement as well as empirical analysis. For this fundamental research, I, therefore, solely rely on the concept definition of Raustiala for my analysis of the legal-institutional effects.

For the legal-institutional effects, the regulation is the commitment made about an IPR multilateral agreement within a PTA. Applied to the concept of legal effects, I define for the legal-institutional effects the *implementation* as the entry into force of the PTA. This is the time when the PTA becomes part of the binding law for the PTA-member countries. Under *compliance,* I understand the ratification of the IPR multilateral agreements referenced in the PTA because it stands for the time when the IPR multilateral agreement becomes legally binding for the acceding country. For *effectiveness,* I consider those PTA members that had not ratified an IPR multilateral agreement at the time of the PTA signature, referenced it in the PTA and by the time of entry into force (or a predefined convention deadline) have acceded to the IPR multilateral agreement.

I argue that there are two forms of effectiveness for legal-institutional effects. Firstly, on the domestic level for countries individually, and secondly, on the PTA level for the group of PTA members. The domestic effect means that a specific country adapts its behaviour, whereas the PTA-member effect entails that only some of the PTA members change their behaviour. For example, some PTA members were already part of the IPR multilateral agreement before signing the PTA, or some PTA members do not comply with the PTA provisions. However, there might be at least partial effectiveness on the PTA-level as long as some of the PTA members comply with the PTA provisions and have to adjust their behaviour. These assumptions on the concepts of legal-institutional effects are displayed in *Figure 14*:

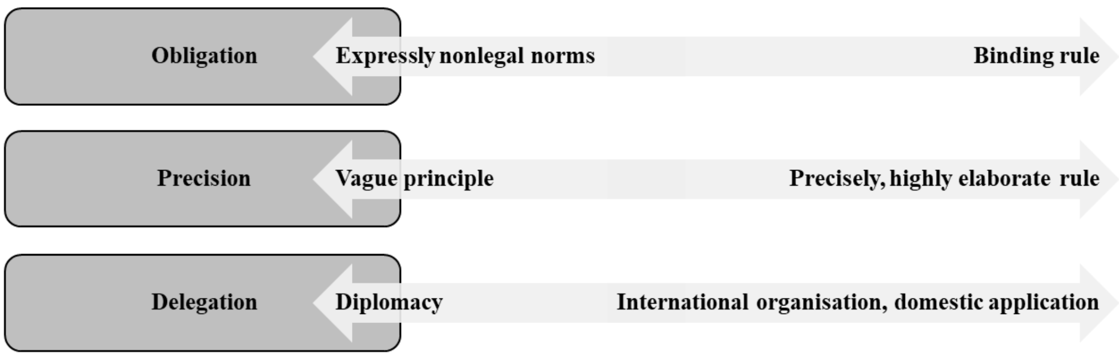
Figure 14: Legal-Institutional Effects of IPR Multilateral Coherence Commitments



PTAs represent a legally binding regulation once they have entered into force. However, the variation in the legal formulations of references to IPR multilateral agreements suggests that not all references will lead to the same domestic action. For example, in the agreement between China and Switzerland signed in 2013, the countries reaffirm a number of IPR multilateral agreements such as the Paris and Berne Convention " (Chapter 11 Article 11.3.1), and state that "*each Party shall make all reasonable efforts to ratify or accede to the Beijing Treaty on Audiovisual Performances*" (Chapter 11 Article 11.3.2).

This differentiation between the forms of bindingness indicates that the effect on the domestic action might be different as well and that IPR agreements included in the reaffirmation part are more likely to be ratified than the Beijing Treaty. Thus, my assumption is that the legal-institutional effects are driven by the bindingness of the IPR multilateral commitments. According to legal theory, the legal bindingness of commitments can be described by the three dimensions of legalisation: obligation, precision and delegation. as *Figure 15* illustrates this concept and is a marginally modified version of the figure by K: W. Abbott et al. (2000, 404 fig. 1):

Figure 15: The Dimensions of Legalisation



Obligation refers to the level of the legal bindingness of the norms, that can range from non-binding towards binding law. *Precision* stands for to the room for interpretation due to the specification of a regulation. Thereby, a highly general statement is considered to be less binding than a highly precise provision. *Delegation* accounts for the level of relegated authority such as diplomacy or investor-state dispute settlement mechanism (K. W. Abbott et al. 2000). Legalisation can range on each dimension from a non-binding, soft legalisation towards a binding, hard legalisation.

The dimensions are independent of one another and can be combined in different ways, i.e. scoring more to the left on one dimension whilst scoring more to the right on the other dimensions. For example, the TRIPS agreements scores on the right side of the continuum of all three dimensions. Shaffer and Pollack (2013, 201) argue that the multi-dimensionality of this concept of legalisation is its strength and that the more common binary differentiation of soft vs. hard law loses much of its explanatory power. I will therefore apply all three dimensions in a feasible manner to the reference of IPR multi-lateral agreements in PTAs.

Firstly, my analysis focuses on the commitment to the IPR multilateral provisions and not their content. Thereby, the obligation can be considered to score towards the right side and be binding one the PTA enters into force:

> *"The fundamental international legal principle of* pacta sunt servanda *means that the rules and commitments contained in legalized international agreements are regarded as obligatory, subject to various defenses or exceptions, and not to be disregarded as preferences change. They must be performed in good faith regardless of inconsistent provisions of domestic law."*
> K. W. Abbott et al. (2000, 409)

Secondly, I use my coding of the degree of bindingness for the IPR multilateral coherence variables (see *3.1.2.4 IPR Multilateral Coherence Variables*) for the precision dimension. For example, statements that are not explicit such as "shall endeavour" accession provisions score much more to the left on the precision dimension (see K. W. Abbott et al. 2000, 412). Such commitments are assigned a lower score for my IPR multilateral coherence variables than those references which require accession to an IPR multilateral agreement. Thirdly, I differentiate for the delegation dimension between those agreements that are administrated by the WIPO and are assumed to assign more delegation, whereas those agreements not assigned to the WIPO are considered for scoring more on the left of the delegation dimension. For my analysis, I test how well the dimensions of legalisations can explain the legal-institutional effects. As the dimension of obligation is the same for all cases, i.e. all refer to PTAs, I do not derive a specific hypothesis for this dimension. The legalisation dimension with the most variation is the precision dimension, which I will use for most of my hypotheses.

For the legal-institutional effect of implementation, I assume that the impact of the precision dimension is irrelevant. The PTA includes not only many other more precise, obliging and delegating provisions on IPR besides IPR multilateral coherence references. Rather IPR itself makes up only a small part of the overall PTA. Thus, the effect of the more or less binding commitments on IPR multilateral coherence is less than likely to significantly influence the entry into force of the PTA.

Hypothesis 1: The bindingness of IPR multilateral coherence commitments in the PTA has no significant effect on their implementation.

However, the precision of the commitments is expected to have a positive effect on their compliance. This means that a PTA including a specific provision of reaffirmation or accession towards an IPR multilateral agreement is assumed to have a stronger positive effect on the ratification of the respective IPR multilateral agreement opposed to PTAs simply referencing the IPR agreement. An underlying assumption is, that countries also choose PTAs to reinforce or repeat their pre-existing commitments to IPR multilateral agreements. For example, if a country has already ratified an agreement it is more likely to include a precise commitment on the agreement in the PTA as it will not require any adaption cost. In these cases, the country is already compliant with the provisions before the PTA. Nevertheless, this would result in compliance with the PTA provisions regardless of the impact on the status quo.

Hypothesis 2: The bindingness of IPR multilateral coherence commitments in the PTA increases their compliance.

Unlike the measures for compliance, the effectiveness calls for a change in the status quo. Hereby, I assume that mostly highly precise and therefore more binding provisions lead to a change of the status quo and therefore effectiveness. For instance, where a country was not part of an IPR multilateral agreement at the time of PTA signature, it will only agree to precise provisions such as the reaffirmation of the IPR multilateral agreement if it intends to oblige with the PTA provisions. Therefore, I assume that there is also a positive relation between the bindingness of the IPR multilateral coherence provisions and the effectiveness of these provisions.

Hypothesis 3: The bindingness of IPR multilateral coherence commitments in the PTA increases their effectiveness.

The effect for effectiveness might be less significant than the legal-institutional effect for compliance, as the latter commitment can also be made without resulting in any adaption costs.

As for the legal-institutional effect of delegation, I expect that IPR multilateral agreements under the auspice of the WIPO score more to the right of the delegation dimension. For instance, WIPO negotiates and develops new IPR multilateral agreements and is financially not dependent on the contributions of its members and mostly financed by the fees for their administered treaties (World Intellectual Property Organization 2015, 8). Therefore, I expect that those IPR multilateral agreements administered by the WIPO have a stronger legal-institutional effect.

Hypothesis 4: The effect of WIPO-administered IPR multilateral agreements is stronger than the effect of other IPR multilateral agreements.

5.1.2 Legal-institutional Effects: Data

The basis for the legal-institutional effects data is the IPRs in PTAs dataset, namely the variables on IPR multilateral coherence (*3.1.2.4 IPR Multilateral Coherence Variables*), which I transformed from a PTA-level to a country-level format. Thus, the transformed dataset includes a data entry for each year a PTA was signed per country. As it is based on the IPRs in PTAs dataset it also covers 202 countries and the years range from 1948-2018 (see *3.3 Descriptive Statistics*).

Additionally, I created another dataset based on these multilateral IPR agreements mentioned in PTAs. This dataset matches the PTA commitments on multilateral coherence to the ratifications of these multilateral agreements by countries. However, two conventions included in PTAs are excluded from the analysis, namely the Doha Declaration and the uniform domain name resolution (UDRP). Both could not be included as it is unclear in which year countries have complied with the respective regulation and it is therefore not possible to construct the dependent variables. Moreover, I did not differentiate between the various versions of the UPOV Convention (1968, 1972, 1978 and 1991). The data thus covers the information on the legal-institutional effects of 30 IPR multilateral agreements mentioned in PTAs. I downloaded the raw data from the WIPO website (2018b) and compiled a country-level dataset comprising an overview of countries ratification of IPR multilateral agreements over time. Hereby, the data entries are ‘*0*’ for years where a country has not yet ratified an IPR multilateral agreement and ‘*1*’ for the year it has as well as all the consecutive years.

Finally, I merged the two country-level datasets containing the PTA-specific and domestic information. The used the PTA-specific data for the explanatory variables and the information of this domestic ratification dataset for the construction of the dependent variables. Both operationalisations are described in the next subchapters, followed by the control variables, some descriptive statistics and the models of analysis.

5.1.2.1 Legal-institutional Effects: Dependent Variables

I analyse the three dependent variables, which are based on the concept of legal-institutional effects: implementation, compliance and effectiveness (*Figure 14*).

Implementation measures if a PTA has become legally binding and is operationalised by a binary variable differentiating those entries for PTAs, which have entered into force (‘*1*’) and those that have not entered into force (yet; ‘*0*’).

Compliance describes those cases where a reference to an IPR multilateral agreement was made in a PTA and this commitment was fulfilled, i.e. the PTA members ratified the IPR multilateral agreement. The compliance variable thus codes the domestic ratification of an IPR multilateral agreement by the time of entry into force of the PTA or where applicable the extended deadline for the treaty accession. Of course, countries can also be compliant if the already ratified the IPR multilateral agreement before the PTA was signed. The measure is calculated for each of the IPR multilateral agreements as a binary variable (‘*1*’ for compliant, ‘*0*’ for not compliant). Subsequently, I created two indexes based on these binary variables. The first one is additive and gives an overview of the number of IPR multilateral agreement commitments a country has complied with per PTA. The second one represents the average score of compliance per PTA, i.e. the average compliance over the number of total references to IPR multilateral commitments.

Effectiveness describes those instances where countries comply with their commitments made in PTAs, and this compliance leads to a change in the status quo. I operationalise effectiveness as countries that had not ratified the IPR multilateral agreement at the time of the PTA signature (compliance equals ‘0’) and that have ratified it by the time predefined in the PTA, i.e. either by the time of entry into force or an extended deadline (compliance equals ‘*1*’). The effectiveness variable is coded as ‘*1*’ where these to conditions are met and ‘*0*’ otherwise. Same as for the compliance variable, the effectiveness variable is first measured for the specific IPR multilateral agreements (binary) and subsequently for the overall effectiveness of the PTA provision on IPR multilateral coherence (sum resp. average per PTA).

However, not all of the references to IPR multilateral agreements require ratification. Only the references I categorised with a bindingness score of '*4*' and '*5*' (see *3.1.2.4 IPR Multilateral Coherence Variables*) strictly require the accession and ratification of the referenced agreements. Yet, the referencing could also indicate a countries' intent to comply with the respective agreement regardless of the legal bindingness stated in the PTA. Therefore, I differentiate between *strict compliance,* which is legally required by the PTA (score of '*4*' or '*5*') and *broad compliance* (score higher than '*0*'), meaning that any of the IPR multilateral agreements is mentioned regardless of the bindingness of the provision. Furthermore, I apply the categorisation of strict and broad also to the measure of effectiveness, which is based on the compliance measure. *Table 52* on the following page summarises all of the compliance and effectiveness measures used in the following analysis.

Table 52: Strict and Broad Compliance and Effectiveness Measures

	Strict IPR multilateral coherence commitments > 3	**Broad** IPR multilateral coherence commitments > 0
Compliance	Compliance sum strict Compliance average strict	Compliance sum broad Compliance average broad
Effectiveness	Effectiveness sum strict Effectiveness average strict	Effectiveness sum broad Effectiveness average broad

There are also cases where the measures of compliance and effectiveness are not applicable ('*NA*'). For example, where a PTA does not include any references to an IPR multilateral agreement, there also can be no compliance with an agreement. The same is true if the PTA includes no references scoring higher than '*3*' and can therefore not score positively on the strict compliance score. Moreover, where the PTA has not entered into force, the provisions are not legally binding, and the compliance cannot be attributed to the PTA. Moreover, where countries are not compliant with an reference to an IPR multilateral agreement, yet the extended deadline for ratification has not been reached yet (i.e. it lies in the future).

5.1.2.2 Legal-institutional Effects: Explanatory Variables

I use the IPR multilateral coherence variables from my IPRs in PTAs dataset as explanatory variables (*3.1.2.4 IPR Multilateral Coherence Variables*). Derived from the theory of legal-institutional effects, I define the measures for obligation, precision and delegation for the IPR multilateral coherence variables.

For the *obligation* dimension, all variables have the same score because the measure for obligation is represented by their legal form: PTAs. Thus, I will disregard this dimension for the analysis. For the *precision* dimension, I use the bindingness coding of the IPR multilateral coherence variables. Besides using the scale ranging from 0-5, I also use each category of the range as a binary variable in order to identify if any category has a specifically significant effect (*3.1.2.4 IPR Multilateral Coherence Variables*). For the *delegation* dimension, I make a binary differentiation between WIPO-administrated IPR multilateral agreements vs. those agreements not administered by the WIPO. So far, there has been no research on the legal-institutional effects of IPR multilateral coherence in PTAs. As my research is foundational research, I focus only on the theoretical concepts and refrain from adding more explanatory variables. However, I include some control variables described in the next subchapter.

5.1.2.3 Legal-institutional Effects: Control Variables

To control for other explanatory variables that could influence the legal-institutional effects, I draw back on some of the control variables used for the design analysis (*4.2.3 Control Variables*).

Firstly, I include the predefined country blocks with a specific interest in IPRs: classic IP leaders, countries with a high increase of patent protection and new IP producers and developers (*3.3.7 Descriptive Statistics Grouped by Selected Countries*). Each block includes four countries that represent particular IPR interests (*Table 17: IPR Country Selection Criteria*). It could be that these countries show an increased interest in multilateral IPR protection due to their domestic interest in IPR. In order to protect their interests, they could pursue multiple strategies of IPR regulation and make sure that the PTA provisions are complied with. These three country blocks could thus positively affect compliance or even effectiveness. Secondly, I control for the economic capacity of countries at the time of PTA signature and include the logarithmised GDP (lnGDP) and GDP per capita (lnGDPpc). In order to protect IPR, countries need a certain level of resources to spare and especially in regards to IPR a substantial amount of domestic knowledge to implement the ratified IPR multilateral agreements. It is thus expected that a higher GDP and GDPpc have a positive effect on compliance. Thirdly, the geographical distance between countries could affect compliance as well as effectiveness. Hereby, I expect that countries closer to their trading partners are more likely to comply with their IPR multilateral agreement commitments, as they are more likely to interact with PTA members regularly, which increase control as well as dependency factors. The geographical distance is thus expected to have a negative impact on compliance as well as effectiveness.

5.1.2.4 Legal-institutional Effects: Descriptive Statistics

The data includes a total of 4179 data entries containing the country-level information of the IPR multilateral coherence commitments per PTA. Out of these 4179 entries, there are 1859 including broad IPR multilateral coherence provisions, i.e. with a positive bindingness score, as well as 1637 including strict commitments (bindingness score higher than '*3*'). *Figure 16* on the next page shows the legal-institutional effects for those data entries that do include strict resp. broad IPR multilateral coherence provisions.

Figure 16: Descriptive Statistics for the Legal-institutional Effects

Implementation

	Strict		Broad	
0	82	5%	128	7%
1	1555	95%	1731	93%

Compliance

	Strict		Broad	
0	29	2%	22	1%
1	1377	84%	1709	92%
NA	231	14%	128	7%

Effectiveness

	Strict		Broad	
0	1038	63%	1256	68%
1	368	22%	475	26%
NA	231	14%	128	7%

The implementation box highlights that 95% of PTAs including strict commitments on IPR multilateral coherence made in PTAs entered into force. The share of broad commitments is with 93% slightly lower and indicates that stricter IPR multilateral coherence commitments are not hindering PTAs from entering into force.

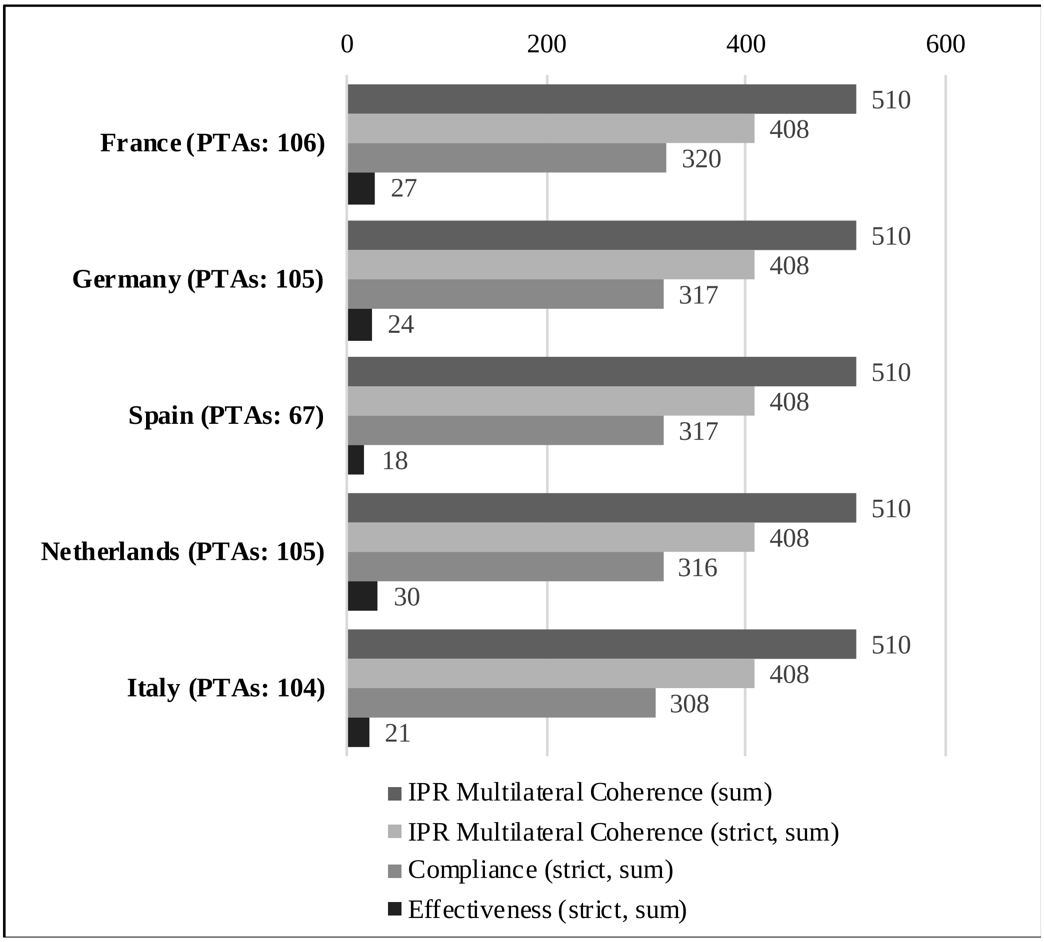
The compliance box shows that the average compliance for strict provisions is 84%. This means that out of the binding commitments made in PTAs, 84% are followed through by the time agreed upon in the PTA. Surprisingly, the overall compliance with IPR multilateral commitments represented by the broad score is with 92% even higher. This could indicate that countries even comply with commitments where the legal bindingness does not require them to, or that countries references mostly those IPR multilateral agreements which they are already complying with, even it is in a non-binding form.

The effectiveness box illustrates that the effectiveness of strict commitments is 22%. This means that in approximately every fifth case, a country agrees upon strict IPR multilateral agreements that require a change of the status quo and then follows through on its commitment. In relation to the compliance score, this suggests that out of those that are compliant with the strict commitments made in PTAs, only every fourth adjusts their status quo (22%/84%) and the others already ratified the IPR multilateral agreement before signing the PTA. This suggests that only in one-third of all PTAs, the strict commitments to IPR multilateral agreements require a change of the status quo and are ratified. Moreover, the effectiveness for broad commitments is 26%, meaning that the broad commitments are not only more often complied, but also are more likely to lead in a change of the domestic status quo than the strict commitments. A stricter level of bindingness is thus not necessarily the best approach to achieve higher overall compliance and effectiveness with PTA commitments.

Of course, compliance and effectiveness levels vary immensely across countries. The EU members have not only the highest number of agreement, but their agreements also include many (strict) references to IPR multilateral agreements. *Graph 25* shows the top five countries of the absolute score of strict compliance, and all of them are EU members, namely France, Germany, Spain, the Netherlands, and Italy. France includes in its 106 PTAs a total of 510 references to IPR multilateral agreements out of which 408 are strict commitments. It complies with 320 out of these 408 strict commitments, and only 27 of these strict commitments complied with France required a changed in the status quo. The scores for the other countries are highly similar and slightly lower.

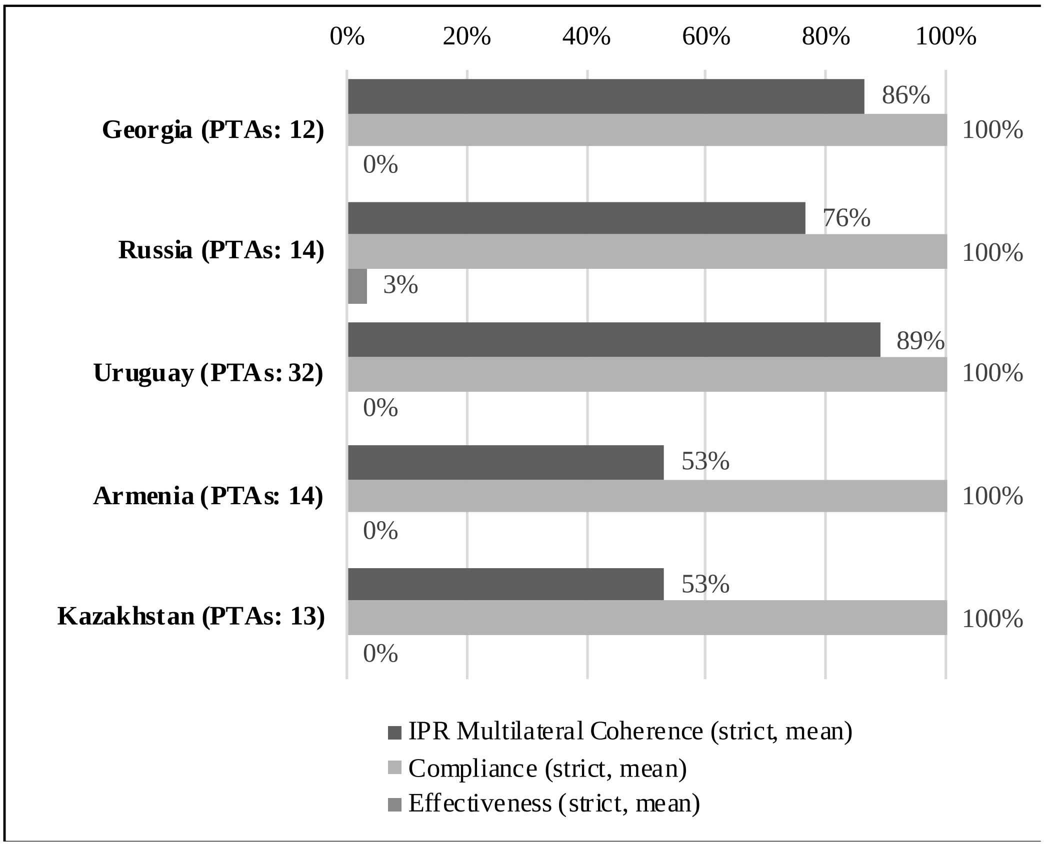
Graph 25 suggests that the EU agreements do include many strict commitments to IPR multilateral agreements across their PTAs, yet that these commitments mostly do not request them to change their status quo. This could mean that the request the change from their PTA members as well as them reinforcing their existing commitments to IPR multilateral coherence through PTAs. However, there are also some strict commitments without compliance, which in combination with the low number of effectiveness, that EU members are less willing to follow through on commitments if they require a change in their status quo.

Graph 25: Top 5 Countries for Strict Compliance (absolute)



Graph 26 on the next page shows the top five countries for relative strict compliance per PTA, i.e. the share of strict commitments implemented by the date set in the PTA. Here, the top-scoring countries are Georgia, Russia, Uruguay, Armenia and Kazakhstan. Of course, their absolute number of PTAs, as well as strict commitments, is considerably lower than for the EU members. But they all show a perfect score on the share of compliance, which means that they follow through on all their commitments made. For example, 86% of all IPR multilateral commitments made in PTAs with Georgia are strict commitments, and it has ratified all of these IPR multilateral agreements by the time agreed upon in the PTA. Armenia and Kazakhstan show a lower share of strict commitments amongst all the mentioned IPR multilateral coherence in their PTAs, but also show a score of 100%.

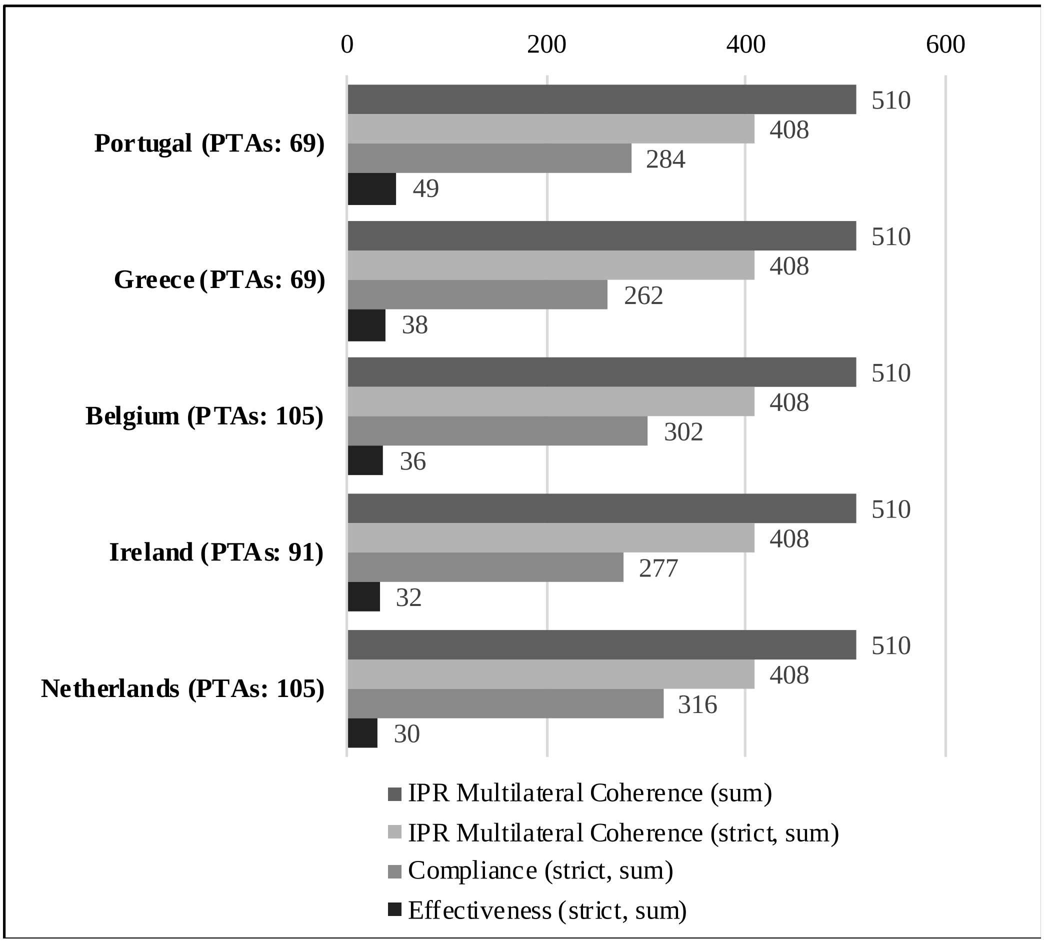
Graph 26: Top 5 Countries for Strict Compliance (relative)



Albeit these perfect scores, the effectiveness share in *Graph 26* indicates that except for Russia, the perfect score is solely due to a repetition of commitments to previously ratified IPR multilateral agreements.

Graph 27 on the following page illustrates the five countries, which have changed their status quo most often by complying to new IPR multilateral agreements. Again, the countries are exclusively EU members, namely Portugal, Greece, Belgium, Ireland and the Netherlands. For all five top-scoring countries on absolute effectiveness, their overall score of IPR multilateral references is 510 out of which 408 are strict commitments. Except for the Netherlands, these EU countries score lower on absolute compliance, having complied with fewer agreements than the top five countries. However, out of those that they have complied with, Portugal shows the highest number of effectiveness. This means that at the time of PTA signature, Portugal had not ratified the IPR multilateral agreement, yet had done so by the time set in the PTA. *Graph 27* also shows that countries sign multiple PTA including identical provisions. The absolute effectiveness score for Portugal (‘*49*’) is higher than the total number of IPR multilateral agreements (‘*30*’). For instance, Portugal makes the same commitment to the WCT and WPPT in the PTAs Chile EC 2002, EC Montenegro 2007 and EC Serbia 2008. Portugal ratified the WCT and WPPT in 2010, thus after the date of signature of the PTAs and within the timeframe set in all three PTAs. This shows that countries also repeat their previous IPR multilateral commitments in PTAs before they have complied to them.

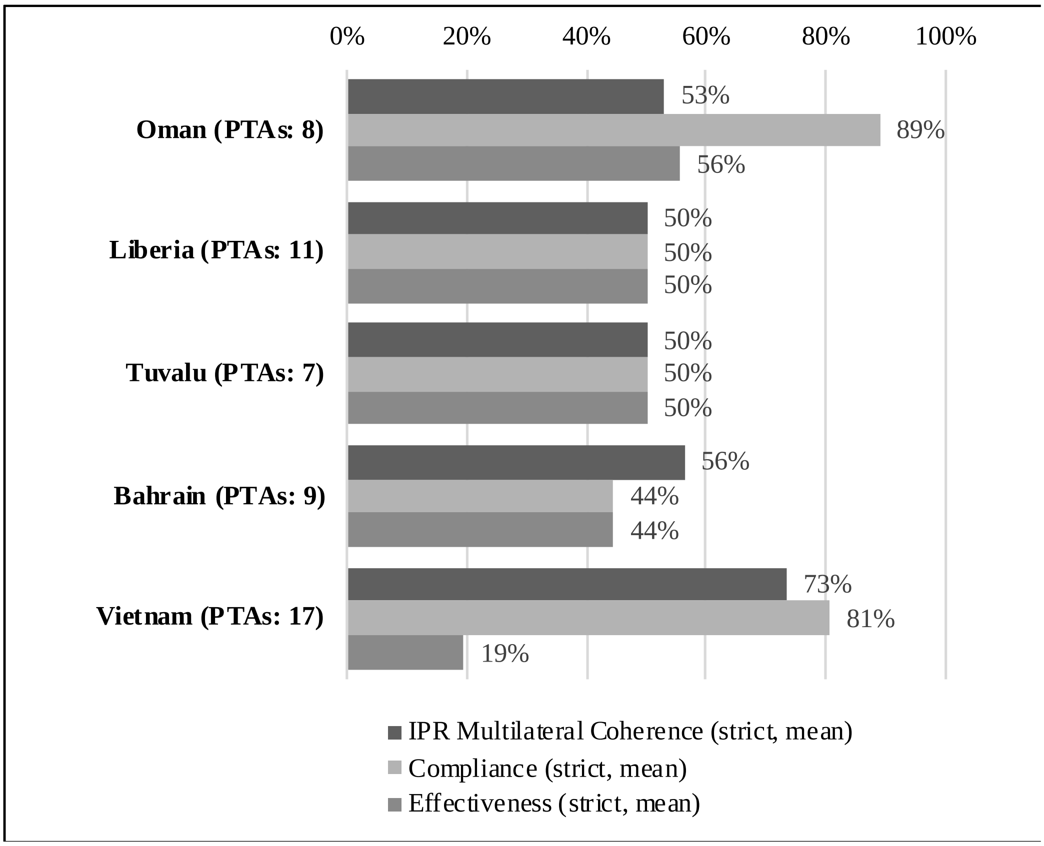
Graph 27: Top 5 Countries for Strict Effectiveness (absolute)



Graph 28 on the next page shows the effectiveness score relative to the overall strict commitments made by countries and shows that Oman, Liberia, Tuvalu, Bahrain and Vietnam are the countries with the highest share of strict effectiveness per PTA. This means that these five countries are the ones that most often follow up on strict commitments made in PTAs even if these commitments require them to change the status quo.

For example, Oman has an overall of nine strict commitments and an absolute strict effectiveness score of ‘*5*’. Oman thus has a lower absolute effectiveness score than the countries shown in *Graph 27*, but on average includes a larger share of strict IPR multilateral commitments in their PTAs that requires them to change the status quo and follows up on them.

Graph 28: Top 5 Countries for Strict Effectiveness (relative)



When looking at the legal-institutional effects from a PTA perspective, the data shows that out of the PTAs including strict commitments, there are 91% which show compliance by at least one PTA member and 32% which show some level of effectiveness (strict IPR multilateral commitments: 255 PTAs, strict compliance: 233 PTAs, strict effectiveness: 82 PTAs). Thus only every third PTA requesting a change in the status quo of at least one PTA member leads to an effective change in the domestic ratification of an IPR multilateral agreement.

Expectedly, there are certain IPR multilateral agreements scoring much higher resp. lower on compliance as well as effectiveness. The IPR multilateral agreements with the highest score for strict compliance are the CBD (99.7%), Paris Convention (99.3%), Berne Convention (99.2%), PCT (98.9%) and the WIPO Convention (97.6%). The lowest scores of compliance are observed for the Singapore Treaty (63.6%), PLT (58.8%), Brussels Convention (52.4%), Vienna Agreement (45.5%) and the Beijing Convention (0%). Hence, the Beijing Convention is the only one with no compliance, so far. As it has only been signed in 2012 and is, therefore, a reasonably young agreement, this number is likely to rise in the upcoming years.

For strict effectiveness, the scores per IPR multilateral agreement are much lower, but also show substantial preferences. The top five IPR multilateral agreements leading to a change in the status quo are seen for strict commitments to the Protocol to the Madrid Agreement (27.4%), the PLT (20.6%), WPPT (17.6%), WCT (16.5%) and the Nairobi Treaty (12.5%). The five agreements with the lowest effectiveness score are the Madrid Agreement, WIPO Convention, UCC Geneva, UCC Paris and the Beijing Convention, which all have a 0% effectiveness. Except for the Beijing Convention, all were signed in the last century and could show at least some level of effectiveness. Especially since the WIPO Convention, UCC Geneva and UCC Paris score very high for compliance (89% and higher). However, theses IPR multilateral agreements seem to be just a repetition of the status quo of their PTA members and never lead to change. The complete lists for the compliance and effectiveness scores per IPR multilateral agreement are displayed in *Appendix 57: Compliance per IPR Multilateral Coherence Agreements* resp. *Appendix 58: Effectiveness per IPR Multilateral Coherence Agreements*.

As the descriptive data shows, there is substantial variation in the results of the legal-institutional effects depending on the used compliance and effectiveness measures. I will, therefore, vary the dependent variables in the subsequent analysis and run multiple models for the measure variations.

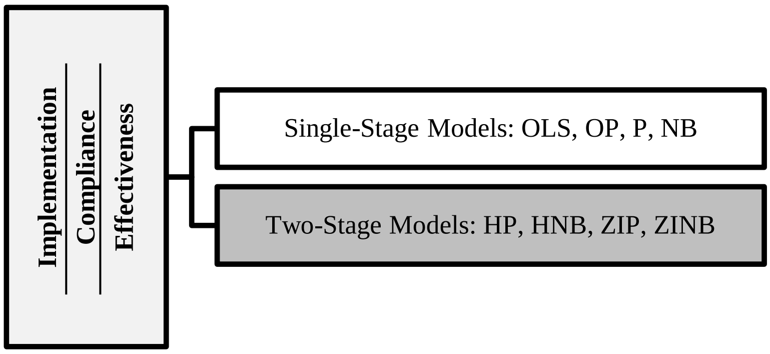
5.1.2.5 Legal-institutional Effects: Models of Analysis

The regression models are simplified and focus on the postulated relations between the dimensions of legalisation and legal-institutional effects. As the aim of this analysis is to conduct fundamental research, there might be other influences that are not captured in these models. However, the selected variables should provide an adequate overview of the legal-institutional effects.

Similar to the design analysis, the dependent variables here also show an excessive number of zeros (see *Figure 16: Descriptive Statistics for the Legal-institutional Effects*). I will thus apply the same model specifications as for the design analysis (*4.2.5 Design:*

Models of Analysis), namely the single stage OLS, OP, P, NB regression as well as the two-stage HP, HNB, ZIP, ZINB models:

Figure 17: Legal-Institutional Effects Model Specifications



The dependent variables are the binary measures for implementation (model names starting with *m1*), the additive and average index for compliance (beginning with *m2*) as well as the additive and average index for effectiveness (commencing with *m3*). For compliance and effectiveness, I differentiate between strict and broad commitments to IPR multilateral agreements (see *Table 52: Strict and Broad Compliance and Effectiveness Measures*). In total, I test 480 models: for each of the five dependent variables, I run the eight models once for the summary measure of IPR multilateral coherence as well as for the five binary measures bindingness of IPR multilateral coherence for strict as well as broad measures. The model fit for the compilable models is displayed in *Appendix 59: Model Fit of Legal-Institutional Effects Analysis (AIC & BIC)*. In the next chapter, I display and describe the best fitting models in order of the dependent variables.

5.1.3 Legal-institutional Effects: Analysis

The following analysis shows that the tested explanatory variables have a significant effect on the legal-institutional effects. Thereby, the best fitting models are exclusively one-stage models and predominately achieved with OLS or NB regressions. I display the models for each of the legal-institutional effects before summarising the results and draw conclusions for the postulated hypotheses (*5.1.3.4*).

5.1.3.1 *Implementation Legal-institutional Effects Analysis*

I expected that the implementation of PTAs is not necessarily connected to the bindingness of IPR multilateral agreements as there are multiple other factors in a PTA that can affect the entry into force of a PTA. Nevertheless, the results of the regression analysis displayed in *Table 53* on the following page show that the overall bindingness of IPR multilateral agreements in PTAs has a significantly negative effect on the implementation of PTAs. The effect is only marginal (*-0.001*), and the model shows other significant effects with a higher impact. First off, the delegation variable accounting for the treaties administrated by the WIPO has a strong positive effect on the implementation of the PTA (*0.092*). Thus, with every additional WIPO administrated IPR agreement referenced in the PTA, the more likely the PTA enters into force.

Table 53: Legal-Institutional Effects Regression – Implementation I

Variables	Estimates (Std. Error)
Precision	
IPR multilateral agreements	-0.001** (0)
Delegation	
WIPO	0.092*** (0.017)
Control Variables	
Classic IP leaders	0.014 (0.011)
Countries with a high increase of patent protection	-0.021* (0.01)
New IP producers and developers	0.05*** (0.013)
ln GDP (mean)	0 (0)
ln GDPpc (mean)	0. (0)
ln Geographic distance (mean)	0 (0)
Intercept	0.915*** (0.008)
Model	m1_ols
Observations	3602

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Out of the control variables, the country blocks have diverging effects. Whereas the classic IP leaders show no significant effect on implementation, the countries with a high increase of patent protection have a significantly negative effect (*-0.021*) and new IP producers and developers a significantly positive effect on implementation (*0.05*). This means that if PTAs are signed by Brazil, China, India or Mexico, they are less likely to enter into force, and the effect is inverted for PTAs by Israel, South Korea, Singapore and or Taiwan. Of course, the effect is intensified if more than one of the countries per block are members of the PTA. Further, the GDP per capita (log) also shows a significantly positive effect on implementation, yet on a marginal level.

In order to see if the level of bindingness of the IPR multilateral agreements matters for the implementation measure, I run the model with the binary factors of the levels of bindingness ranging from '*1*' to '*5*'. The results displayed in *Table 54* show that the level of bindingness indeed matters for the legal-institutional effect of implementation.

Table 54: Legal-Institutional Effects Regression – Implementation II

Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Precision					
Level of Bindingness	***1***	***2***	***3***	***4***	***5***
IPR multilateral agreements	-0.082*** (0.008)	-0.028*** (0.005)	0.005* (0.003)	-0.001 (0.002)	-0.002 (0.002)
Delegation					
WIPO	0.092*** (0.011)	0.061*** (0.011)	0.041*** (0.011)	0.049*** (0.011)	0.06*** (0.014)
Control Variables					
Classic IP leaders	0.01 (0.01)	0.021* (0.011)	0.015 (0.011)	0.016 (0.011)	0.013 (0.011)
Countries with a high increase of patent protection	-0.029** (0.01)	-0.025* (0.01)	-0.021* (0.01)	-0.021* (0.01)	-0.021* (0.01)
New IP producers and developers	0.059*** (0.013)	0.06*** (0.013)	0.049*** (0.013)	0.05*** (0.013)	0.049*** (0.013)
ln GDP (mean)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
ln GDPpc (mean)	0** (0)	0* (0)	0* (0)	0* (0)	0* (0)
ln Geographic distance (mean)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Intercept	0.92*** (0.008)	0.912*** (0.008)	0.915*** (0.008)	0.915*** (0.008)	0.916*** (0.008)
Model	m1.1_ols	m1.2_ols	m1.3_ols	m1.4_ols	m1.5_ols
Observations	3602	3602	3602	3602	3602

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The more binding commitments a PTA includes that are low on the bindingness score, the less likely the PTA enters into force. Namely, for the precision category '*1*' and '*2*', the effects are significantly negative (*-0.082*; *-0.028*). The effect becomes significantly positive for the subsequent category '*3*' (*0.005*), yet on a marginal level. This means that the more IPR multilateral agreements are included with provisions such as "shall make every possible effort to accede to" the more likely this PTA will enter into force. And more importantly, for the legally binding commitments represented by the categories '*4*' and '*5*', there is no significant effect observed for implementation, meaning that strict commitments neither significantly hinder nor enable the entry into force of PTAs.

The direction of the other effects remains constant for the various levels of bindingness. Only for the bindingness of '*2*' a significant additional effect can be observed. For PTAs which include IPR multilateral commitments which reaffirm certain parts of said IPR agreements are more likely to enter into force if one or more of the PTA members are the classic IP leaders, i.e. the US, EU, EFTA and or Japan.

The analysis shows that the bindingness of the IPR multilateral agreements has some significant effects on the implementation of PTAs. However, these effects are only observed for the legally non-binding commitments, and their significance might be circumstantial. Theoretically, it seems unlikely that non-binding PTA commitments have the power to stop a PTA from entering into force. Moreover, the other effects in the model have a higher impact on implementation than the bindingness of IPR commitments, which suggest that the IPR multilateral coherence design features have no substantial impact on the legal-institutional effect of implementation.

5.1.3.2 Compliance Legal-institutional Effects Analysis

The analysis of the legal-institutional effect of compliance shows that it is indeed affected positively by the level of bindingness of the IPR multilateral agreements. Thereby, the effects are more pronounced for the additive than for the average compliance scores. *Table 55* on the next page displays the strict and broad compliance regression results for the best fitting models.

The effects for the explanatory variable have the same direction, regardless of whether the compliance is measured strictly or broadly. Precision has a positive effect on the sum of compliance, which is more pronounced for strict measures (*0.098*) than for the broad measure (*0.018*). Thus, with an increase of the precision of the commitments to IPR multilateral agreements, the compliance with these commitments increases, especially for legally binding commitments. This positive effect cannot be observed for the average measure of strict compliance and is only marginal for the average of broad compliance. This suggests that the effect of bindingness is tied to the number of agreements a country complies by and less the average compliance per PTA.

Table 55: Legal-Institutional Effects Regression – Compliance I

	Compliance Sum		**Compliance Mean**	
	Strict	**Broad**	**Strict**	**Broad**
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Precision				
IPR multilateral agreements	0.098*** (0.003)	0.018*** (0)	0 (0)	0.002*** (0)
Delegation				
WIPO	0.903*** (0.142)	1.205*** (0.059)	-0.032. (0.018)	-0.145*** (0.017)
Control Variables				
Classic IP leaders	-0.019 (0.082)	0.09*** (0.027)	0.027. (0.014)	-0.008 (0.013)
Countries with a high increase of patent protection	0.359* (0.154)	-0.115* (0.054)	0.066* (0.026)	0.085*** (0.023)
New IP producers and developers	-0.657*** (0.096)	0.044 (0.034)	-0.019 (0.016)	-0.044** (0.015)
ln GDP (mean)	0*** (0)	0*** (0)	0*** (0)	0** (0)
ln GDPpc (mean)	0 (0)	0** (0)	0** (0)	0*** (0)
ln Geographic distance (mean)	0*** (0)	0*** (0)	0 (0)	0*** (0)
Intercept	–	0.102. (0.056)	0.881*** (0.015)	0.944*** (0.013)
Model	m2ss_op	m2bs_p	m2sm_ols	m2bm_ols
Observations	1203	1474	1203	1474

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Furthermore, with an increase of WIPO-administrated treaties referenced in the PTA, the odds of compliance rise as well. The effect is significant for all measures, yet positive for both measures of the sum of compliance (*0.903*; *1.205*) and negative for the average compliance measures (*-0.032*; *-0.145*). This indicates that the more WIPO-administrated treaties are referenced in a PTA, the higher the compliance in absolute numbers of IPR multilateral agreements referenced in the PTA, but also the lower is the compliance compared to all the references of such agreements in the PTA.

For the control variables, the effects are more divergent. The classic IP leaders have only a significantly positive effect on the sum of compliance towards broad IPR multilateral coherence and the average compliance for strict commitments. This means that PTAs, where the US, EU, EFTA and or Japan are members, are more likely to include references to IPR multilateral agreements, where PTA members comply to these references even without a legally binding commitment in the PTA. On the other hand, their PTAs are also more likely to achieve a higher strict compliance average, which means that out of all the strict commitments made per PTA, there will be more likely compliance to these commitments if one of these countries is a PTA member. However, this positive effect could also be related to the matter that, for instance, the EU and EFTA PTAs mention many IPR multilateral agreements, which have already been ratified by most of their members.

The countries with a high increase of patent protection have mostly a significantly positive effect on compliance, except for the sum of compliance with broad commitments, where a significantly negative effect is observed (*-0.115*). Thus, if Brazil, China, India and or Mexico are PTA members, the PTA is more likely to include more strict commitments, which are complied. Moreover, out of all the commitments made in the PTA, be they strict or broad, a higher share of them is complied with if at least one of these countries is a PTA member. However, if these countries are part of a PTA, which includes non-binding references to agreements, the (legally non-required) compliance with these commitments is significantly lower for PTAs with these four countries. If one signs a PTA with countries with a high increase of patent protection, the odds of compliance are thus fairly high for strict commitments and negative for broad ones.

PTAs with the new IP producers and developers show only significantly negative effects on compliance, however, not for all measures. The effect is significantly negative for the sum of strict compliance (*-0.657*) and the average of broad compliance (*-0.044*). This implies that PTAs with Israel, South Korea, Singapore and or Taiwan are much less likely to include a higher number of strict commitments that are complied. Moreover, they are also less likely to comply with many of the referenced to IPR multilateral agreements in their PTAs.

The average GDP (log), GDP per capita (log) and geographic distance (log) all show a positive effect on compliance, yet on a highly marginal level (*estimates < 0.00000*). Compared to the other measures, they can only explain a small share of the strict as well as broad compliance of countries. In order to see if a specific level of bindingness drives the results, *Table 56* shows the effects for the sum of strict compliance according to the level of bindingness whereas *Table 57* shows the average of strict compliance.

Table 56 shows that all of the levels of IPR multilateral coherence bindingness have a significant effect on the sum of strict compliance. However, the legally non-binding measures (categories '*1*', '*2*' and '*3*') have a negative effect on the sum of strict compliance and the strict measures (categories '*4*' and '*5*') show a positive one. Hereby, the effect is marginally stronger for the highest category of bindingness (*0.063*). The results indicate that strict compliance is negatively affected by an increased number of non-binding references to IPR multilateral agreements in the PTA as well as positively influenced by a higher number of strict IPR multilateral commitments.

Table 56: Legal-Institutional Effects Regression – Compliance (strict, sum) II

Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Precision					
Level of Bindingness	***1***	***2***	***3***	***4***	***5***
IPR multilateral agreements	-0.321*** (0.054)	-0.165*** (0.013)	-0.09*** (0.021)	0.043*** (0.004)	0.063*** (0.003)
Delegation					
WIPO	2.938*** (0.126)	1.949*** (0.074)	2.868*** (0.125)	1.815*** (0.074)	1.47*** (0.073)
Control Variables					
Classic IP leaders	-0.041 (0.08)	0.033 (0.044)	-0.009 (0.08)	-0.223*** (0.045)	0.15*** (0.04)
Countries with a high increase of patent protection	0.423** (0.152)	0.262** (0.085)	0.495** (0.151)	0.218** (0.084)	0.073 (0.076)
New IP producers and developers	-0.351*** (0.094)	0.009 (0.057)	-0.348*** (0.094)	-0.181*** (0.055)	-0.137** (0.05)
ln GDP (mean)	0*** (0)	0*** (0)	0*** (0)	0*** (0)	0*** (0)
ln GDPpc (mean)	0*** (0)	0*** (0)	0*** (0)	0*** (0)	0*** (0)
ln Geographic distance (mean)	0*** (0)	0*** (0)	0*** (0)	0*** (0)	0*** (0)
Intercept	–	0.012 (0.076)	–	0.129. (0.075)	0.014 (0.072)
Model	m2ss.1_op	m2ss.2_nb	m2ss.3_op	m2ss.4_nb	m2ss.5_nb
Observations	1203	1203	1203	1203	1203

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Table 57: Legal-Institutional Effects Regression – Compliance (strict, mean) III

Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Precision					
Level of Bindingness	***1***	***2***	***3***	***4***	***5***
IPR multilateral agreements	-0.058*** (0.009)	0 (0.004)	-0.006. (0.004)	-0.003* (0.001)	0.002. (0.001)
Delegation					
WIPO	-0.015 (0.015)	-0.034* (0.015)	-0.028. (0.015)	-0.029. (0.015)	-0.047** (0.017)
Control Variables					
Classic IP leaders	0.021 (0.014)	0.027. (0.014)	0.026. (0.014)	0.034* (0.014)	0.033* (0.014)
Countries with a high increase of patent protection	0.047. (0.026)	0.066* (0.026)	0.063* (0.026)	0.065* (0.026)	0.063* (0.026)
New IP producers and developers	-0.011 (0.016)	-0.019 (0.016)	-0.015 (0.016)	-0.019 (0.016)	-0.016 (0.016)
ln GDP (mean)	0*** (0)	0*** (0)	0*** (0)	0*** (0)	0*** (0)
ln GDPpc (mean)	0* (0)	0** (0)	0** (0)	0** (0)	0* (0)
ln Geographic distance (mean)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Intercept	0.889*** (0.015)	0.881*** (0.015)	0.88*** (0.015)	0.88*** (0.015)	0.877*** (0.015)
Model	m2sm.1_ols	m2sm.2_ols	m2sm.3_ols	m2sm.4_ols	m2sm.5_ols
Observations	1203	1203	1203	1203	1203

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Table 57 highlights that the effects on the average compliance to strict commitments are much less pronounced than the effects for absolute compliance. For the categories '*1*' and '*3*', the effect remains significantly negative, whereas category '*2*' shows no significant effects on average compliance. Furthermore, the effect is also significantly negative for the binding category '*4*', and the only significant positive effect is found for the highest bindingness category '*5*'. Thus, unlike for the absolute compliance the average strict compliance is impacted negatively by IPR multilateral commitments requesting an accession and positively to reaffirmations. This could imply that most compliance can be found for countries, which repeat, i.e. reaffirm their pre-existing commitments to IPR multilateral agreements in PTAs instead of requesting at least one PTA member to accede to one of these agreements post PTA signature.

Table 58: Legal-Institutional Effects Regression – Compliance (broad, sum) IV

Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Precision					
Level of Bindingness	***1***	***2***	***3***	***4***	***5***
IPR multilateral agreements	0.046* (0.019)	-0.012 (0.01)	0.033*** (0.005)	0.027*** (0.003)	0.058*** (0.003)
Delegation					
WIPO	2.013*** (0.064)	2.031*** (0.064)	1.989*** (0.064)	1.987*** (0.063)	1.633*** (0.062)
Control Variables					
Classic IP leaders	0.08. (0.041)	0.079. (0.042)	0.056 (0.04)	-0.011 (0.041)	0.255*** (0.036)
Countries with a high increase of patent protection	-0.15. (0.078)	-0.17* (0.077)	-0.15* (0.076)	-0.149* (0.075)	-0.223** (0.069)
New IP producers and developers	-0.04 (0.051)	-0.016 (0.054)	-0.04 (0.051)	-0.018 (0.05)	0.032 (0.045)
ln GDP (mean)	0*** (0)	0*** (0)	0*** (0)	0*** (0)	0*** (0)
ln GDPpc (mean)	0*** (0)	0*** (0)	0*** (0)	0*** (0)	0*** (0)
ln Geographic distance (mean)	0*** (0)	0*** (0)	0*** (0)	0*** (0)	0*** (0)
Intercept	0.125* (0.063)	0.137* (0.063)	0.145* (0.062)	0.151* (0.062)	0.077 (0.06)
Model	m2bs.1_nb	m2bs.2_nb	m2bs.3_nb	m2bs.4_nb	m2bs.5_nb
Observations	1474	1474	1474	1474	1474

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

For broad commitments, the regression analysis shows a different picture. Whereas for the absolute strict compliance (*Table 56*), the effects are all significant and negative for the legally non-binding and positive for the binding commitments, the absolute broad compliance shows only significantly positive effects (*Table 58*) except for category '*2*' without significant effects.

The effects are far less pronounced than for the absolute strict compliance, implying that the compliance to non-binding commitments is affected on a lower level by the precision of the commitments. Moreover, all of the categories show a similar effect on the sum of broad compliance, which indicates that this effect is not driven by a particular form of commitment. The commitments reaffirming specific parts of IPR multilateral agreements (category '*2*') has no significant effect on compliance, which could imply that such commitments are redundant.

Table 59: Legal-Institutional Effects Regression – Compliance (broad, mean) V

Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Precision					
Level of Bindingness	***1***	***2***	***3***	***4***	***5***
IPR multilateral agreements	-0.026*** (0.007)	-0.014*** (0.004)	0 (0.002)	0.001 (0.001)	0.007*** (0.001)
Delegation					
WIPO	-0.073*** (0.014)	-0.078*** (0.014)	-0.082*** (0.014)	-0.084*** (0.014)	-0.124*** (0.016)
Control Variables					
Classic IP leaders	-0.018 (0.014)	0 (0.014)	-0.009 (0.014)	-0.012 (0.014)	0.008 (0.014)
Countries with a high increase of patent protection	0.062** (0.023)	0.078*** (0.023)	0.074** (0.023)	0.076** (0.023)	0.075** (0.023)
New IP producers and developers	-0.048** (0.015)	-0.033* (0.016)	-0.048** (0.016)	-0.048** (0.015)	-0.042** (0.015)
ln GDP (mean)	0*** (0)	0*** (0)	0*** (0)	0*** (0)	0*** (0)
ln GDPpc (mean)	0*** (0)	0*** (0)	0*** (0)	0*** (0)	0*** (0)
ln Geographic distance (mean)	0*** (0)	0*** (0)	0*** (0)	0*** (0)	0*** (0)
Intercept	0.96*** (0.013)	0.944*** (0.013)	0.949*** (0.013)	0.949*** (0.013)	0.942*** (0.013)
Model	m1.1_ols	m1.2_ols	m1.3_ols	m1.4_ols	m1.5_ols
Observations	3602	3602	3602	3602	3602

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Comparing the average compliance of strict (*Table 57*) and broad commitments (*Table 59*) shows that the effects are highly similar for categories ‘*1*’ and ‘*5*’. In both cases, the effect is significantly positive for the strict bindingness and significantly negative for the least binding commitment. The categories in-between alternate in their significance. For average broad compliance, the effect is only significantly negative for category ‘*2*’, whereas the effects of average strict compliance are significantly negative for ‘*3*’ and ‘*4*’.

The average compliance of broad and strict commitments are thus affected the same for the lowest and highest level of precision, whereas the effects in-between are mostly significantly negative for the average compliance with strict commitments than with broad commitments. This suggests that the more non-binding references a PTA includes, the less likely the countries will comply with their commitments, regardless if their strict or broad. In like manner, an increase of reaffirmation commitments, countries are more likely to comply with their IPR multilateral coherence commitments. This could indicate that shallower IPR commitments lead to less overall compliance than stringent ones.

In the following chapter, I connect the compliance to those instances where the IPR multilateral coherence commitments led to a change in the domestic ratification of the IPR multilateral agreements.

5.1.3.3 Effectiveness Legal-institutional Effects Analysis

The analysis of the effectiveness shows that both precision, as well as delegation, have a significantly positive impact on the effectiveness of IPR multilateral commitments made in PTAs. Moreover, the changes in the status quo are more likely if amongst the PTA members are classic IP leaders.

First off, *Table 60* displays the strict and broad effectiveness regression results for the best fitting models.

Table 60: Legal-Institutional Effects Regression – Effectiveness I

	Effectiveness Sum		**Effectiveness Mean**	
	Strict	**Broad**	**Strict**	**Broad**
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Precision				
IPR multilateral agreements	0.017*** (0.002)	0.01*** (0.002)	0 (0)	0 (0)
Delegation				
WIPO	3.635*** (1.011)	2.716*** (0.47)	0.046*** (0.011)	0.051*** (0.009)
Control Variables				
Classic IP leaders	1.301*** (0.185)	0.955*** (0.165)	0.045*** (0.009)	0.027*** (0.007)
Countries with a high increase of patent protection	-0.019 (0.465)	-0.721. (0.406)	0 (0.016)	-0.016 (0.012)
New IP producers and developers	0.148 (0.209)	-0.083 (0.207)	0.024* (0.01)	0.012 (0.008)
ln GDP (mean)	0* (0)	0 (0)	0 (0)	0 (0)
ln GDPpc (mean)	0*** (0)	0* (0)	0*** (0)	0*** (0)
ln Geographic distance (mean)	0*** (0)	0*** (0)	0*** (0)	0*** (0)
Intercept	-5.421*** (1.01)	-4.003*** (0.46)	0.011 (0.009)	0.021** (0.007)
Model	m3ss_nb	m3bs_nb	m3sm_ols	m3bm_ols
Observations	1203	1474	1203	1474

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The precision variables have a significantly positive effect on the sum of effectiveness, yet not on average effectiveness. This means that with an increase of the precision the effectiveness of both the strict and broad commitments increase as well. However, the precision has no significant effect on the average effectiveness. The delegation variable also has a significantly positive effect on all measures of effectiveness, indicating that with an increase of WIPO-administrated agreements in the PTA both the absolute as well as the relative number of legally binding as well as non-binding commitments increases.

Moreover, the control variables also have a significant effect on the effectiveness measures. The most pronounced one can be observed for the classic IP leaders, which have a strong significantly positive effect on the sum of both strict and broad effectiveness as well as on a lower level for the average effectiveness. Thus, if the US, EU, EFTA and or Japan are PTA members, it is more likely that the IPR multilateral coherence commitments in a PTAs are complied with and lead to a change in the status quo of at least one PTA member. This suggests that if PTAs with these countries either ask for more changes if the status quo and or are able to follow through on them respectively make their PTA partners compliant. Classic IP leaders thus impact the multilateral IPR regulation by including and following up on their IPR multilateral coherence commitments in their PTAs.

Countries with a high increase of patent protection only have a significantly negative effect on the sum of effectiveness for broad commitments (*-0.721*). This means that if one of these countries is part of the PTA, the PTA members are less likely to either comply with the IPR multilateral commitments and or they do not require a change of the status quo. As *Table 55* already shows a significantly negative effect for broad compliance, it is likely that PTAs with Brazil, China, India and or Mexico are less likely leading to compliance as well as more likely to repeat the status quo in PTAs than requesting a change by PTA members. Thus, PTAs with the countries with a high increase of patent protection are less likely to change the multilateral IPR regulation as they both negatively affect compliance as well as effectiveness.

New IP producers and developers also have only one significant effect, namely a positive one on the average effectiveness of strict commitments (*0.024*). This indicates that PTAs with Israel, South Korea, Singapore and or Taiwan as members are more likely to comply with a higher share of all their commitments made even if these commitments require a change of the status quo. As the effect is only visible for the strict effectiveness, it can be assumed that they tend to include fewer commitments in their PTAs, yet are compliant even if the commitments mean they or their PTA partners have to adjust their status quo. Because *Table 55* shows no significant effect of these countries for the strict compliance, it can be assumed that they are not simply repeating their pre-existing IPR multilateral commitments, but use PTAs to enforce IPR multilateral regulations by requesting other to change their status quo or doing it themselves.

The remaining control variables average GDP (log), GDP per capita (log) and geographic distance (log) all have a significantly positive effect on effectiveness, yet on a marginal level (*estimates < 0.000*). This means that their impact on effectiveness happens on a negligible level.

In order to analyse the effects of precision on effectiveness in more detail, I look first at the sum of effectiveness for strict commitments in *Table 61* and then on their average effectiveness in *Table 62*.

Table 61: Legal-Institutional Effects Regression – Effectiveness (strict, sum) II

Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Precision					
Level of Bindingness	***1***	***2***	***3***	***4***	***5***
IPR multilateral agreements	-0.26*** (0.076)	-0.921*** (0.133)	-0.021 (0.039)	0.125*** (0.009)	-0.017 (0.013)
Delegation					
WIPO	2.008*** (0.367)	4.55*** (1.005)	4.341*** (1.006)	3.98*** (1.008)	4.407*** (1.007)
Control Variables					
Classic IP leaders	0.94*** (0.131)	1.579*** (0.179)	1.313*** (0.191)	0.854*** (0.19)	1.259*** (0.194)
Countries with a high increase of patent protection	0.02 (0.299)	-0.048 (0.442)	-0.026 (0.474)	0.165 (0.453)	0.005 (0.472)
New IP producers and developers	0.155 (0.148)	0.511* (0.214)	0.021 (0.216)	0.138 (0.21)	-0.023 (0.216)
ln GDP (mean)	0 (0)	0** (0)	0. (0)	0* (0)	0. (0)
ln GDPpc (mean)	0* (0)	0 (0)	0 (0)	0** (0)	0 (0)
ln Geographic distance (mean)	0*** (0)	0*** (0)	0*** (0)	0*** (0)	0*** (0)
Intercept	–	-5.801*** (1.012)	-5.414*** (1.011)	-5.193*** (1.009)	-5.379*** (1.011)
Model	m3ss.1_op	m3ss.2_nb	m3ss.3_nb	m3ss.4_nb	m3ss.5_nb
Observations	1203	1203	1203	1203	1203

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The effects of the non-binding levels of precision are significantly negative for categories '*1*' (*-0.26*) and '*2*' (*-0.921*) and significantly positive for category '*4*' (*0.125*), whilst the other categories are not significantly affected. This means that the more references or partial reaffirmations of IPR multilateral agreements are in a PTA, the less will the PTA lead to a change of the status quo of domestic reaffirmation of these IPR multilateral agreements. And as to be expected, the only positive effect comes out of those legally binding PTA provisions requiring PTA members to accede to one of the IPR multilateral agreements.

The lack of a significant effect for category '*3*' ("*shall make an effort to accede*") shows that these non-binding commitments in PTAs will not lead to a change of the status quo. Likewise, the reaffirmation category '*5*' seems to serve a mere consolidation purpose of pre-existing regulation and does not lead to a change of the status quo of PTA members.

Table 62: Legal-Institutional Effects Regression – Effectiveness (strict, mean) III

Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Precision					
Level of Bindingness	***1***	***2***	***3***	***4***	***5***
IPR multilateral agreements	-0.014* (0.006)	-0.015*** (0.002)	0.003 (0.002)	0.007*** (0.001)	-0.004*** (0.001)
Delegation					
WIPO	0.052*** (0.009)	0.055*** (0.009)	0.046*** (0.009)	0.037*** (0.009)	0.068*** (0.01)
Control Variables					
Classic IP leaders	0.044*** (0.009)	0.057*** (0.009)	0.045*** (0.009)	0.029*** (0.008)	0.035*** (0.009)
Countries with a high increase of patent protection	-0.004 (0.016)	0.006 (0.015)	0.002 (0.016)	0.003 (0.015)	0.005 (0.016)
New IP producers and developers	0.026** (0.01)	0.042*** (0.01)	0.022* (0.01)	0.025** (0.009)	0.02* (0.009)
ln GDP (mean)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
ln GDPpc (mean)	0*** (0)	0*** (0)	0*** (0)	0*** (0)	0*** (0)
ln Geographic distance (mean)	0*** (0)	0*** (0)	0*** (0)	0** (0)	0*** (0)
Intercept	0.013 (0.009)	0.002 (0.009)	0.011 (0.009)	0.013 (0.009)	0.016. (0.009)
Model	m3sm.1_ols	m3sm.2_ols	m3sm.3_ols	m3sm.4_ols	m3sm.5_ols
Observations	1203	1203	1203	1203	1203

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The results for the average effectiveness of strict commitments paint a similar picture. As *Table 62* on the previous page shows, the level of precision has a significant effect on all categories except category '*3*'. The previous assumptions about the negative effect of non-binding commitments on the effectiveness of strict commitments are thus reaffirmed, as well as the positive effect of legally binding commitments calling for the accession of an IPR multilateral agreement (category '*4*'). This means that more precise commitments have only a positive effect on strict effectiveness if the precision requires PTA members to accede to an IPR multilateral agreement.

Additionally to the effects previously seen for the sum of effectiveness, category '*5*' shows a significantly negative effect on the average effectiveness of strict commitments. This strengthens the presumptions that the mere reaffirmation of IPR multilateral agreements in PTAs serves another purpose than changing the status quo.

Table 63 displays the results for the sum of effectiveness to broad commitments.

Table 63: Legal-Institutional Effects Regression – Effectiveness (broad, sum) IV

Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Precision					
Level of Bindingness	***1***	***2***	***3***	***4***	***5***
IPR multilateral agreements	-0.011 (0.072)	-0.857*** (0.111)	0.034* (0.017)	0.127*** (0.009)	-0.047*** (0.011)
Delegation					
WIPO	3.143*** (0.461)	3.263*** (0.456)	3.1*** (0.461)	2.846*** (0.462)	3.366*** (0.463)
Control Variables					
Classic IP leaders	1.005*** (0.17)	1.306*** (0.158)	0.992*** (0.166)	0.549*** (0.165)	0.919*** (0.168)
Countries with a high increase of patent protection	-0.842* (0.404)	-0.772* (0.388)	-0.802* (0.402)	-0.519 (0.388)	-0.83* (0.393)
New IP producers and developers	-0.173 (0.21)	0.307 (0.21)	-0.167 (0.208)	-0.054 (0.202)	-0.258 (0.209)
ln GDP (mean)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
ln GDPpc (mean)	0 (0)	0 (0)	0 (0)	0* (0)	0 (0)
ln Geographic distance (mean)	0*** (0)	0** (0)	0*** (0)	0*** (0)	0*** (0)
Intercept	-4.006*** (0.461)	-4.316*** (0.463)	-4.003*** (0.461)	-3.86*** (0.457)	-3.951*** (0.46)
Model	m3bs.1_nb	m3bs.2_nb	m3bs.3_nb	m3bs.4_nb	m3bs.5_nb
Observations	1474	1474	1474	1474	1474

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

For the sum of effectiveness to broad commitments, *Table 63* shows that the effects are different from the ones for strict commitments (*Table 61*). For category '*1*', there is no significant effect. Instead, the effects for categories '*3*' and '*5*' become significant. The effects are significantly negative for categories '*2*' (*-0.857*) and '*5*' (*-0.047*), and interestingly significantly positive for both categories '*3*' (*0.034*) and '*4*' (*0.127*). This means that for those PTAs reaffirming certain parts or the entire IPR multilateral agreement, there is less effectiveness of broad commitments. Further, PTAs including more non-binding and binding accession requirements have a positive effect on the sum of effectiveness of broad commitments. This means that the more PTA provisions require accession to an IPR multilateral agreement or at least a reasonable effort to do so are more likely to lead to a change of the status quo of at least one PTA member. The non-binding accession commitments seem to have a positive effect after all and increase the overall effectiveness of PTAs.

Table 64: Legal-Institutional Effects Regression – Effectiveness (broad, mean) V

Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Precision					
Level of Bindingness	***1***	***2***	***3***	***4***	***5***
IPR multilateral agreements	-0.004 (0.004)	-0.016*** (0.002)	0.001 (0.001)	0.007*** (0.001)	-0.004*** (0.001)
Delegation					
WIPO	0.045*** (0.007)	0.048*** (0.007)	0.042*** (0.007)	0.034*** (0.007)	0.069*** (0.008)
Control Variables					
Classic IP leaders	0.026*** (0.007)	0.038*** (0.007)	0.027*** (0.007)	0.013. (0.007)	0.017* (0.007)
Countries with a high increase of patent protection	-0.016 (0.012)	-0.011 (0.012)	-0.014 (0.012)	-0.008 (0.011)	-0.015 (0.012)
New IP producers and developers	0.013 (0.008)	0.029*** (0.008)	0.012 (0.008)	0.015* (0.008)	0.009 (0.008)
ln GDP (mean)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
ln GDPpc (mean)	0*** (0)	0*** (0)	0*** (0)	0*** (0)	0* (0)
ln Geographic distance (mean)	0*** (0)	0*** (0)	0*** (0)	0*** (0)	0*** (0)
Intercept	0.022** (0.007)	0.015* (0.007)	0.02** (0.007)	0.021** (0.006)	0.024*** (0.007)
Model	m3bm.1_ols	m3bm.2_ols	m3bm.3_ols	m3bm.4_ols	m3bm.5_ols
Observations	1474	1474	1474	1474	1474

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Finally, *Table 64* shows the effects on the average effectiveness of broad commitments and the effects are almost identical to the ones on strict commitments (*Table 62*). The only difference is that the precision category '*1*' loses its significance. This means that the level of precision has the same effect on the average effectiveness for both strict as well as broad commitments. Thus, the only positive effect on the average effectiveness can be observed for those commitments requesting the accession to an IPR commitment. This means that the average change in the status quo is higher for those provisions specifically demanding the accession to an IPR multilateral agreement, whilst the other commitments either are not complied with and or have no effect on the status quo.

Overall, the effectiveness analysis shows that both precision and delegation play a significant role in the absolute and relative effectiveness of IPR multilateral commitments. However, the role of the included PTA members, namely the classic IP leaders, plays a crucial role as well.

5.1.3.4 Summary of Legal-Institutional Effects Analysis

As seen in the analysis, the legal-institutional effects are indeed affected by the different forms of legalisation. Both precision, as well as delegation, affect the implementation, compliance and effectiveness of the IPR multilateral coherence commitments made in PTAs. Moreover, the analysis provides evidence that most of the postulated hypotheses are reaffirmed (see *5.1.1 Legal-institutional Effects: Theory*). Before summarising the most important results, *Table 65* lists the hypotheses, their relation based on the theory ('*T*') as well as the relation shown in the regression analysis ('*RA*').

Table 65: Overview of the Analysis for Legal-Institutional Effects

Hypotheses and Conclusions		**Relation**
H1	The bindingness of IPR multilateral coherence commitments in the PTA has no significant effect on their implementation.	T: no effect RA: negative/ no effect
H2	The bindingness of IPR multilateral coherence commitments in the PTA increases their compliance.	T: positive RA: positive
H3	The bindingness of IPR multilateral coherence commitments in the PTA increases their effectiveness.	T: positive RA: positive
H4	The effect of WIPO-administered IPR multilateral agreements is stronger than the effect of other IPR multilateral agreements.	T: positive RA: positive

Hypothesis 1 is tested with the implementation analysis (*5.1.3.1*). The overall score shows a significantly negative effect, which is contrary to the postulated hypothesis suggesting no effect. However, the effect is highly marginal (*-0.001*) and only significantly negative for the two lowest scoring non-binding commitments ('*1*' and '*2*'), and even significantly positive for the third non-binding commitment ('*3*'). Further, the two binding precision categories ('*4*' and '*5*') show no significant effect on implementation. H1 can thus only partially be accepted, namely for strict commitments. The non-binding commitments show a significantly positive as well as negative effect on implementation and H1 should thus be rejected.

Hypothesis 2 is checked by the compliance analysis (*5.1.3.2*). And indeed, precision has a significantly positive effect on compliance and H2 can be reaffirmed. The same is true for hypothesis 3, which is covered by the effectiveness analysis (*5.1.3.3*). Here, the level of bindingness also shows a significant positive effect on the effectiveness of IPR multilateral agreements in PTAs. Thus, H3 can be reaffirmed as well. However, the analysis shows that the control variables, especially the country blocks also have a considerable effect on the effectiveness. The most distinct effect is thereby observed for the classic IP leaders, which have a significantly positive impact on effectiveness.

Hypothesis 4 is tested in all three analysis by the inclusion of the delegation variable for WIPO-administrated treaties. The analyses show that the delegation to WIPO indeed has a significantly positive effect on implementation, compliance and effectiveness. The only significantly negative effect can be observed for the average compliance score, which suggests that more WIPO-administrated treaties do increase the overall compliance, yet might decrease the compliance with non-WIPO administrated agreements. Overall, the results for delegation reaffirm H4.

Concluding, both precision as well as delegation affect the legal-institutional effects. However, the analysis shows that many of the binding commitments in PTAs are repetitions of the status quo and that only commitments with a binding accession requirement are leading to effectiveness.

5.1.4 Legal-institutional Effects: Conclusion

The analysis shows that the legal commitments made to IPR multilateral agreements do matter and that compliance with the PTA commitments is very high (see *Figure 16: Descriptive Statistics for the Legal-institutional Effects*). Furthermore, in a clear majority of cases, the countries are not required to change their pre-existing commitments to IPR multilateral agreements, which indicates, on the one hand, that countries often reaffirm their status quo in the PTAs, and on the other hand, that only a minority of PTA members has to adjust their status quo. For future research, it would be interesting to analyse what role the power argument plays and which countries are more likely to repeat respectively adjust their status quo. For a more detailed analysis, future research should analyse countries behaviour in more depth, for instance, by making country-specific case studies. These could account for the domestic intentions to join an IPR multilateral agreement aside from the PTA provisions. Further, the analysis of legal-institutional effects can be adapted for the analysis of other multilateral agreements mentioned in PTAs besides IPR multilateral agreements.

Future research can also build on my analysis of legal-institutional effects to measure the legal effects of IPRs in PTAs. My data already builds the starting point with the variables on IPR. These variables could be matched by a domestic IPR coding of the same variables. Currently, there already exists domestic data on a substantial part of the TRIPS-plus data for several countries by Gold et al. (2019) that could be analysed for the legal effects of the TRIPS-plus variables. Ideally, the data would expand to the other IPR variables as well and expand the country coverage of Gold et al. (2019). Only by comparing the full coverage of IPRs in PTAs, their domestic legal effects become measurable. Due to the lack of such a domestic coding, I refrain from a partial analysis of the TRIPS-plus legal effects and devote my next chapter to the economic effects of IPRs in PTAs.

5.2 Economic Effects

At the centre of the analysis of the economic effects are the postulated effects of IPR protection (see *Figure 4: Rationale of IPRs*). Thus, the aim of this chapter is to test if the design of IPRs in PTAs shows any indications of a positive effect on the factors anticipated by the rationale of IPRs. For instance, countries are willing to regulate the market of intellectual property because they expect a positive effect of IPR protection on FDI and innovation. The analysis of the economic effects should show if there is any statistical evidence that the design of IPRs in PTAs matters economically.

The rationale of IPR protection is widely accepted, yet there is comparatively little empirical evidence for the postulated economic effects of IPRs. This has to do with the nature of the affected factors such as FDI, which are affected by various other elements besides IPRs, and the structural difference between IPRs and their alleged impacted factors:

> "*The idea that patents are necessary to support invention is so ingrained that we would expect there to be massive empirical evidence in its favour. In fact, systematic evidence of any causal relationship has always been elusive, in part because of the difficulty of finding data that could firmly attribute investments on inventions to changes in national patent laws and regulations. The former are microeconomic decisions while the latter are macroeconomic conditions that are challenging to quantify*." Maskus (2012, 44)

This argument by Maskus can be expanded to IPRs in general. Thus, one of the issues of IPR analysis is the gap between the two levels of analysis. The microeconomic factors such as FDI can supposedly be explained (partially) by macroeconomic elements such as IPR regulation. However, there is a lack of comparative data on domestic IPR legislation, i.e. data that covers the development over time for multiple countries in a comparative manner. And additionally, most existing explanatory data strongly generalises IPR by using patent protection as the only indicator for IPR regulation. Thus, the economic effects of stronger IPR protection are empirically challenging to identify (Fink and Reichenmiller 2005, 7). This makes causal statements such as "IPRs increase FDI" difficult to analyse and support with statistical evidence, as the effects cannot be solely allocated to changes in IPR regulation and often the definition of IPRs actually refers exclusively to patents.

Nevertheless, there have been studies analysing the economic effects of IPRs that found a significant relationship between postulated factors and domestic IPR regulation.

Until now, there existed no comprehensive and detailed datasets covering the commitments on IPRs in PTAs, and consequentially, studies on the effects of IPRs in PTAs are rare. The previous research on the topic predominately used a binary coding of PTAs, which either include IPR commitments versus PTAs without an IPR provisions to test the economic effects. Such a simplification of design measures was a common approach for the effect analysis of PTAs, and Dür et al. (2014, 354) stated that "*many studies conceptualize PTAs as a dichotomous variable, namely whether countries sign an agreement or not, and hence treat PTAs as if they were all equal in purpose and effect.*" By moving beyond the binary coding of PTAs design features, the analysis of effects becomes more meaningful. Due to the knowledge on the design variations of IPRs in PTAs, I can analyse if the economic effects are based on more stringent IPR protection or if it is enough for a PTA to include general IPR statements. The rationale of IPR claims many positive effects for itself and the analysis of PTAs with stringent IPRs in PTAs should reflect at least some of these tendencies. Otherwise, the design of IPRs– at least in PTAs – might not matter in the way that the rationale of IPR in PTAs suggests.

In the following subchapters, I provide an overview of the theory for the economic effects and analysed factors, followed by a description of the data and the regression analysis, which tests the postulated hypotheses.

5.2.1 Economic Effects: Theory

The theory of economic effects is based on the rationale of IPRs (see *2.2.1.2 Rationale of IPRs*). Summarising the rationale, IPR is intermediately expected to compensate for seed capital, lead to investment in R&D, create reliability for consumers, improve the quality of the IPR protected goods, help consumers to overcome information asymmetries, create an obligation to disclose information, lag competition, increase FDI and licensing (outcome). From a long-term perspective, IPRs are expected to increase innovation, technology transfer, growth and welfare (impact).

Previous research was predominately conducted for the economic effects of domestic IPR regulation and not IPRs in PTAs. Most of these studies focused on the effect of more stringent patent regulation and used the Ginarte-Park patent right index as IPR measure (Ginarte and Park 1997). The Ginarte-Park index is so far the most reliable domestic IPR index as it uses scientific measures to capture domestic patent regulation and encompasses many countries for its long-term study. Of course, there have been other previous IPR indexes such as the patent protection scale developed by Rapp and Rozek (1990) or the IPR components developed by Sherwood (1997). However, all of these other IPR indexes are somewhat less equipped to capture IPR for comparative studies than the Ginarte-Park index, be it due to the measure of IPR, the coverage of countries or the limited reflection of the development over time. There are also more recent IPR indexes such as the International Property Rights Index (IPRI; Property Rights Alliance 2018) and the domestic TRIPS-plus index by Gold et al. (2019). The latter index by Gold et al. (2019) is useful for the analysis of the domestic effects of TRIPS-plus measures, yet it does not measure IPR per se, covers only developing countries with more than 1 million inhabitants (124, from 1995-2011) and compares their TRIPS-plus protection to the one of the US. It is thus a conditional measure of TRIPS-plus protection in developing countries compared to the US regulation rather than a domestic IPR measure. The former index IPRI is highly comprehensive and covers 125 countries from 2007-2018. But it has to be used carefully, as it might not reflect an entirely objective measure of domestic IPRs. The IPRI is a project by the Property Rights Alliance and ranks countries based on their IPR score measured based on domestic IPR as well as national expert opinions and the "Special 301 Report" by the Office of the United States Trade Representative, which might suggest some bias on the IPR measures. Thus, most researchers still draw on the Ginarte-Park index to capture domestic IPRs.

Primarily, previous research focuses on the factors FDI, innovation, technology transfer and growth. Most studies found a positive effect of domestic IPR regulation represented by patent law on innovation (for an overview of previous research on innovation see Maskus 2012, 50 Table 2.4), technology transfer (Maskus 2012, 75 Table 2.7) and growth (Falvey, Foster, and Greenaway 2006). Moreover, the previous research on FDI shows ambiguous results – none, positive as well as negative effects – of more stringent IPR regulation (Maskus 2012, 73 et seqq.). Further, the previous research has shown that the effects vary depending on the countries status of economic development. The effects are either not or less significantly positive for least-developed and developing countries, whereas the effects are mostly positive for more developed countries. For all factors, there are some studies, which show opposing or at least not significant effects and some papers postulate that the effects of IPR are non-linear, i.e. that a steady increase of stringent IPR provisions becomes too stringent and eventually turns initially positive effects into negative ones.

To my knowledge, there is currently only one study on the economic effects of IPRs in PTAs using a more detailed IPR design measure. This study by Maskus and Ridley

(2016) focuses on 24 PTAs by the US, EU and EFTA and identifies IPR design measures for patents, copyrights, trademarks and enforcement. Their analysis finds significant effects of more stringent IPR provisions on aggregate trade, which is most pronounced for middle-income countries. Due to my IPRs in PTAs dataset, I can enrich the previous research by a more comprehensive PTA coverage on both content and scope. For the analysis of the economic effects, I focus on those measures of the rationale, which have been previously researched for IPRs resp. which are measurable by currently existing data. These factors are namely investment in R&D, FDI and licensing, innovation, technology transfer and growth. I shed some light on a selection of these measures and assume that the design of IPR matters to their development. Before going into detail on the theory behind these factors, it is important to disclose that the analysis of IPRs in PTAs differs from domestic IPR analysis in two main points: compliance and effectiveness.

Firstly, the PTA provisions give no indications about the compliance of PTA members. This means that unlike with domestic measures of IPR, the coding of the design of IPR in PTAs does not necessarily implicate that these measures were domestically implemented. As Deere (2009) suggests for the implementation of TRIPS, there is actually a variation on the degree of implementation and thus compliance. This matters for the effect analysis because there should only be an observable effect if the PTA provisions were implemented and, for example, copyright protection is increased. With the implementation of the IPR provisions in PTAs, the right holders enjoy increased protection and their behaviour should be altered changing the anticipated factors such as licensing. But as the legal-institutional analysis has shown, compliance is not perfect, and there might be some countries not complying with the IPR provisions in PTAs and thus skewing the results of the economic effect analysis. However, as there is no data matching the PTA design to control for compliance, and there are indications that before a PTA enters into force the PTA members have to comply with the IPR provisions in the PTA, I will assume for the further analysis that countries comply with their commitments.

Secondly, the PTA provisions might not represent effectiveness, i.e. countries might not comply with them, or the provisions might change only the status quo of some and not all PTA members. For example, Morocco and the US already had a prohibition on parallel imports of pharmaceutical products in place before agreeing on such TRIPS-plus exhaustion provisions in their PTA (Fink and Reichenmiller 2005, 8). Hereby, both Morocco and the US comply with the IPR provisions, because the PTA design repeats the status quo. But it is not an effective commitment, as it does not change the domestic IPR regulation. Therefore, there should not be any observable effects due to the lack of effectiveness (no change, no effect). Consequently, only for those PTA members changing their status quo, there should be an observable economic effect. Looking at the results of the legal-institutional analysis, I assume that most commitments are complied with, but only around every fourth commitment is effective, i.e. complied with and required a change of the status quo. This means that most likely a majority of countries repeats their domestic IPR regulation in PTAs and requires from PTA members to adapt their regulations. Again, the lack of data on the domestic IPR regulation means that there is no ideal way of controlling for effectiveness and compare the situation before the PTA to the one after.

In the case that countries predominately repeat their status quo in PTAs, it might thus be that the economic effect analysis shows the effects of IPRs already implemented domestically rather than the effect of IPRs in PTAs. I control for this factor in two manners. Firstly, by accounting for the IPR commitments, on the one hand, as an overall measure, which might represent more of the domestic IPR effects than the IPRs in PTAs effects. And on the other hand, I calculate a measure of the IPR provisions representing only the first commitment, which was made in a PTA that entered into force (see *5.2.2.2 Economic Effects: Explanatory Variables*). Secondly, by adding the dimension of the development status of countries to the analysis (see *5.2.2.3 Economic Effects: Control Variables*). Hereby, the assumption is that countries with a lower development status are less likely to have stringent domestic IPR regulation due to the high cost of IPR protection and possibly fewer IPR-intensive industries. These countries are therefore more likely to agree to IPR provisions requiring them to change their status quo (effective commitments) whereas countries with a high development status are more likely to repeat their already stringent domestic IPR provisions. The effects of IPRs in PTAs should be more pronounced for those changing their status quo and increasing their IPR regulation due to the PTA commitments, thus theoretically for less developed countries.

In the next subchapters, I describe the theory behind the five factors investment in R&D (*5.2.1.1*), FDI and licensing (*5.2.1.2*), innovation (*5.2.1.3*), technology transfer (*5.2.1.4*) and growth (*5.2.1.5*), and derive hypotheses on the impact of IPRs in PTAs on these factors. The underlying assumption for all factors is that more stringent IPRs in PTAs lead to an increase in the respective factor. In the following subchapters, I test the hypotheses in statistical analysis and check if the effects are indeed varying depending on the development level of countries.

5.2.1.1 Investment in R&D

The rationale of IPRs postulates that through the protection of intellectual property, the IPR holders can generate additional revenue, which they will reinvest in research and development, either to improve their product or to develop new inventions.

The majority of empirical studies testing this assumption find a positive effect of more stringent IPRs – predominately operationalised by looking at patents – on investment in R&D. For example, Kanwar and Evenson (2003) found that there is a significantly positive and pronounced effect of stronger IPR protection on the investment in R&D. Maskus (2012, figs. 2.2c, 2.2d) plotted the investment in R&D as a percentage of the GDP to the five-year lagged Ginarte-Park patent index for the years 1995 and 2000. For both years, he found a clear positive correlation, with an increased correlation for 2000. A more recent study by Banerjee and Nayak (2014) also showed that more stringent IPR protection increased the investment in R&D, at least regarding the Indian pharmaceutical industry. One of the studies testing multiple forms of IPRs was the one by Park (2005). He found that many forms of IPRs have a significant effect on the investment in R&D, but that the main driver are IPR enforcement measures.

I base my hypotheses on the positive relationship found between the investment in R&D and IPR respectively patent regulation. As previous studies mostly used an IPR measure based on patents, it might be, that the effect is only positive for patent provisions in PTAs. However, Park (2005) has found positive effects for other IPR forms, and there is no empirical evidence proposing an opposite effect of the other IPR forms. Therefore, I test the impact of different forms of IPR on the investment in R&D and expect to find a positive relation.

Hypothesis 1.1: Stringent IPR provisions in PTAs increase investment in R&D.

Further, I also test the results of IPR enforcement found by Park (2005) and expect to find an especially pronounced effect on the investment in R&D for the IPR enforcement provisions in PTAs. As other studies have found a positive effect of patents regardless of the enforcement provisions, I refrain from assuming that they are the main drivers behind the positive effect on investment in R&D.

Hypothesis 1.2: Stringent IPR enforcement provisions in PTAs drive the increase of investment in R&D.

5.2.1.2 FDI/ Licensing

The basic assumption for FDI and licensing is that investors respectively rights holders have to be ensured that their investment resp. rights are protected abroad. In connection to IPR, this can be, for instance, an investment in a factory producing high-technology goods such as computing machinery and ensuring the protection of trade secrets, industrial designs or patents, or a factory producing low-technology goods such as textiles being ensured their design and trademark are not imitated. For licensing, this can be, for instance, the protection of literary and artistic work abroad. Thus, investors and right holders are more willing to invest and license in a foreign country, if domestic law abroad ensures that their IPRs are protected.

Among the IPR factors, FDI is one of the most broadly researched ones. One of the earlier studies by Mansfield (1994) finds that lower IPR protection has a negative effect on US FDI, especially regarding the chemical and pharmaceutical sector. In a later study, Mansfield (1995) expands his analysis to Japanese and German FDI, also showing a significantly positive relationship between stronger IPR protection and FDI. In later studies, Javorcik (2004) found a strong positive effect of IPRs on FDI in Eastern European countries, whereas Du et al. (2008) found a significantly positive effect of patents on US FDI in China. In their study, Park and Lippoldt (2008) compare the effects of FDI across multiple developing countries in-between 1990 to 2005 and also found a positive effect of more stringent IPR protection on FDI. Adams (2010) reaffirms their results and shows that there is a significantly positive effect of more stringent patent protection for 75 developing countries from 1985 to 2003. Further, Adams (2010) shows that this positive effect intensified after TRIPS was signed.

However, there are also studies suggesting that the effect between more stringent IPR protection and FDI is weak or not significant (for instance Fink and Primo Braga 1999), or show even negative results (for example Mayer and Pfister 2001). Even though the previous results of the impact of IPR on FDI have been ambiguous, I base my hypotheses on the majority of studies, which find a positive relationship between IPRs and FDI. Concretely, I assume that more stringent IPRs lead to an increase in FDI. Again, it might be that the effects will only be visible for patents as the majority of studies use a patent index as explanatory IPR variable. But as there are no studies indicating negative effects of other forms of IPRs, I assume that more stringent IPR protection increases FDI due to the increased predictability and security of intellectual property, regardless of the protected form of IPR.

Hypothesis 2.1: Stringent IPR provisions in PTAs increase FDI.

For the effect of IPR on licensing, there are fewer studies. One of the first studies by Yang and Maskus (2001) analysed the effect of patent protection represented by the Ginarte-Park index on licensing and found an u-shaped relationship, whereas other studies such as Branstetter, Fisman, and Foley (2006), Branstetter et al. (2011) and Koff et al. (2011) also looked at patent reforms and found a significantly positive effect on licensing. Thus, even though there have been only a few studies on licensing and on most, if not all of them, focus on the effect of patents, I assume that the mechanism for licensing is similar to the one of FDI, and that not only patent but more stringent IPR protection per se has a positive effect on licensing. Therefore, I expect to find an increase in licensing for more stringent IPR provisions.

Hypothesis 2.2: Stringent IPR provisions in PTAs increase licensing.

5.2.1.3 Innovation

IPRs supposedly have a positive effect on innovation, because without the protection of inventions through IPRs, it becomes unattractive to produce and invest in new inventions if they can be easily counterfeit without negative repercussions. For example, according to the rationale of IPRs the investment in a trademark on improving the quality of a good and image of a brand becomes obsolete if everyone can label their product the same way making it impossible for consumers to distinct between the original and the counterfeit. Neither would it make sense for a company to invest millions in research and development of a new drug if once the product is on the market, it can be instantly copied by a rival. The protection of intellectual property thus gives an incentive and encourages innovation according to the rationale of IPRs.

And indeed, the results of economic studies of IPRs on innovation find predominately positive effects. For instance, P. H. Schneider (2005) analysed 47 countries and found that stronger IPRs have a positive effect on innovation and that the effect is more pronounced for countries with a higher level of development. Another study by Chen and

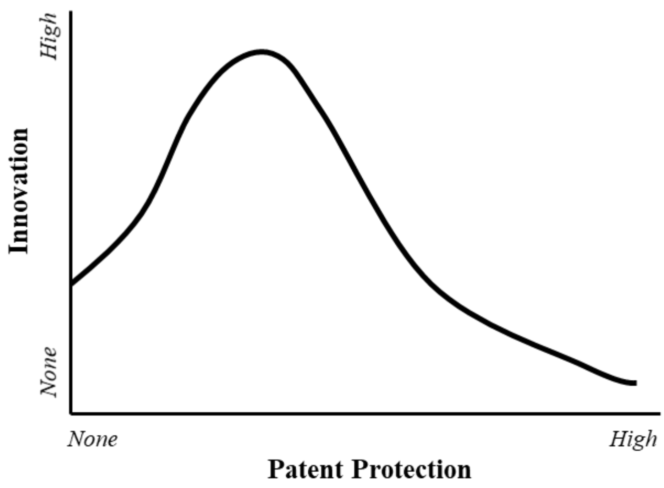
Puttitanun (2005) also found positive effects of more stringent patent protection, whereby the effect is only significant for middle-income countries. Allred and Park (2007) found the same effect, yet significantly positive for developed countries, not only middle-income countries.

The previous studies thus show, that the effect of IPRs on innovation might be connected to the development level of countries, yet so far research shows ambiguous results. Therefore, it would be premature to include the level of development in the postulated hypothesis as the relationship could go either way. Thus, I keep my hypothesis in line with most previous studies and assume that with more stringent IPRs in PTAs comes an increase in innovation. If and how this positive effect might be related to the development level of countries remains to be shown in the analysis.

Hypothesis 3.1: Stringent IPR provisions in PTAs increase innovation.

However, some researchers argue that there is a tipping point to the economic benefits of intellectual property rights. The argument is that after a certain level of protection, IPRs can turn into market barriers and monopolies, which hinder technology transfer and competition benefitting only the rights holder without positive spill-over effects for innovation and society. Dourado and Tabarrok (2015) describe this phenomenon by using the curve displayed in *Figure 18,* which shows the relation between innovation and patent strength. *Figure 18* is a slightly adapted version of the illustration displayed in Dourado and Tabarrok (2015 fig. 3).

Figure 18: Curve of Innovation to Patent Strength



The curve is based on the Laffer curve, which explains the relation between taxes and government revenue (see Buchanan and Lee 1982). Adapted for the relation between innovation and patent strength, the curve shows that stronger patent rights reduce innovation after a certain degree because “*as patents become stronger, the incentives for new innovation decline while the disincentives for using and building on old innovations increases, so the curve must bend eventually*” (Dourado and Tabarrok 2015, 140). Dourado and Tabarrok (2015, 140 et seqq.) provide no indication about when the tipping point occurs, but suggest that the curve is also applicable to other forms of IPR, with slightly varying slopes and occurrences of turning points.

There have been studies, which found a negative or even an inverted u-shaped effect as represented by the curve of innovation to patent strength in *Figure 18*. For example, Lerner (2009) found in his study a negative effect of more stringent IPRs on innovation, whereas Hudson and Minea (2013) found both a negative as well as an inverted u-shaped effect depending on the development level of countries. These results imply that there might be a tipping point of the optimal level of IPRs as proposed by Dourado and Tabarrok (2015). Therefore, I assume that unlike for the other factors affected by IPR measures, there is a tipping point to the positive effects of IPRs for innovation. Based on the previous discussion on the TRIPS Agreement being a minimum or maximum standard of IPR protection (see *Figure 7: Diverging Ideals of IPR Standards*), I postulate that stringent IPR provisions still have a positive effect on innovation as long as they do not go beyond the commitments of TRIPS. If a PTA includes TRIPS-plus provisions, I expect to find a negative effect on innovation.

Hypothesis 3.2: TRIPS-plus provisions in PTAs decrease innovation.

5.2.1.4 Technology Transfer

One of the reasons to protect IPRs is the postulated effect of technology transfers. Maskus (2004, 9) defines technology transfer as “*any process by which one party gains access to a second party's information and successfully learns and absorbs it into his production function. Clearly, much technology transfer occurs between willing partners in voluntary transactions. Thus, there are demanders and suppliers of technology and information is traded in technology markets*.” According to the rationale of IPRs, countries can thus encourage technology transfer by ensuring the IPRs of right holders.

Most studies analysing the effect of IPRs on technology transfer find a strong and significant positive relationship. The operationalisation of technology transfer, however, varies immensely. Whilst some studies use R&D, FDI or licensing data as a measure for technology transfer, other papers look at exports and imports (see Maskus 2012 Table 2.7). I consider technology transfer to be either related to actual disclosure of information related to patent protection and the exchange of IPR-related goods and not the mere transfer of financial flows such as FDI and licensing. For example, I expect technology transfer to be mainly connected to patents, whereby the idea is to receive protection for a limited amount of time and in turn disclose the protected invention afterwards ensuring the transfer of technology. Alternatively, technology is transferred through the import of IPR-related goods, from which the importing countries can advance their technology (see Maskus 2004, 10).

Studies using data on traded goods for technology transfer found mainly apparent positive effects of IPRs. For example, Co (2004) looked at the US in R&D-intensive exports to 71 countries between 1970 to 1992 and found that exports increased significantly with more patent protection in these countries. Ivus (2010) looked at exports of developed countries to developing countries between 1962 to 2000 and also showed that with an increase of patent protection in developing countries comes an increase of patent-sensitive exports to them by developed countries. And Maskus and Yang (2013) analysed the effect of patent reforms before and after TRIPS was signed for 82 countries between 1985 and 2005 and found significant positive effects on technology transfers. The effects are more pronounced after TRIPS was signed, with growing impacts for developing countries around the time of their domestic due date for the TRIPS entry into force. This implies that the positive effects of more stringent IPR provisions in PTAs might be especially pronounced for TRIPS-plus commitments. As the results are not directly linked to the domestic implementation of TRIPS but are based on the interpretation of the authors, I bear their argument in mind, without formulating a separate hypothesis for TRIPS-plus commitments.

The most comprehensive study so far is probably the one by Chen (2017). He analysed 119 countries between 1976 to 2010 and found strong positive effects of more stringent IPR protection on the imports of R&D-intensive products. And as commonly observed for the effect analysis of IPRs, there were also studies finding no significant effect of more stringent IPR protection on imports nor exports (for example Koff et al. 2011).

Due to the predominance of studies finding positive effects using similar measures for technology transfer, I argue that more stringent IPRs have a positive effect on technology transfers.

Hypothesis 4: Stringent IPR provisions in PTAs increase technology transfer.

5.2.1.5 Growth

The rationale of IPR is based on the assumption that, ultimately, IPRs have a positive effect on economic growth. Growth is closely related to competitiveness and innovation, and it is assumed that a short-term restriction of competition through IPRs is legitimised due to the long-term positive effects on innovation, which is one of the driving forces of economic growth. Moreover, all other assumed positive effects of IPRs, such as increased FDI, are supposed to stimulate growth further.

Previous research on the effects of IPRs on growth often focuses on the development of GDP. For example, Gould and Gruben (1996) analysed the relationship between the average yearly per capita growth from 1960 to 1988 to the level of domestic patent protection and found a significantly positive effect of more stringent IPR on economic growth. Falvey et al. (2006) also found a significantly positive effect of IPR on growth measured as the average growth rate of GDP per capita. However, they only found visible effects for low-income and high-income countries, whereas middle-income countries are not significantly affected by more stringent IPR protection.

Similar to the previous research on the other factors, there are also studies suggesting an opposite or no effect of IPRs on growth. For instance, Ostergard (2014, 26) found that IPRs have no significant effect on growth, even differentiated according to the development level of countries. Another recent study by Gold et al. (2019) looked at the effects of domestic TRIPS-plus provisions on the economic growth captured by GDP per capita and found that the effect of IPRs on growth is mostly indirect, through positive effects on technology transfers such as imports. Further, their analysis shows that the effect of growth on more stringent IPRs is much more pronounced than the effect of IPRs on growth. However, their results might not be generalisable to general IPR analysis. As described previously, their IPR measure is based on TRIPS-plus regulations and is conditional to the US IPR regulations. Their results might thus be applied to TRIPS-plus regulation, but not IPR regulation per se and might be biased towards the US IPR regulation standards. However, their results indicate that there might also be a tipping point of the positive effects of IPRs on growth, similar to the one described for innovation. Their IPR measurement through TRIPS-plus factors could represent this tipping point and explain the inverted effects of IPRs on growth. As there have been too few studies on this topic so far, I remain with the previously tested base assumption that stronger IPRs increase growth, which should also be visible for stringent IPR provisions in PTAs.

Hypothesis 5: Stringent IPR provisions in PTAs increase growth.

5.2.1.6 Summary of Economic Effect Hypotheses

Table 66 summarises the eight hypotheses on the economic effects of IPRs in PTA. Based on the previous research, I predominately postulate a positive effect of the IPR design on the five factors investment in R&D, FDI and licensing, innovation, technology transfer and growth. Only for the second hypothesis on innovation, I assume a possible negative impact of TRIPS-plus commitments in PTAs.

Table 66: Economic Effects Hypotheses Overview

Factor	Hypotheses		Relation
Investment in R&D	H1.1	Stringent IPR provisions in PTAs increase investment in R&D.	Positive
	H1.2	Stringent IPR enforcement provisions in PTAs drive the increase of investment in R&D.	Positive
FDI	H2.1	Stringent IPR provisions in PTAs increase FDI.	Positive
Licensing	H2.2	Stringent IPR provisions in PTAs increase licensing.	Positive
Innovation	H3.1	Stringent IPR provisions in PTAs increase innovation.	Positive
	H3.2	TRIPS-plus provisions in PTAs decrease innovation.	Negative
Technology Transfer	H4	Stringent IPR provisions in PTAs increase technology transfer.	Positive
Growth	H5	Stringent IPR provisions in PTAs increase growth.	Positive

I expect there to be variation according to the different IPR forms and the level of IPR protection, be it general IPR provisions, specific IPR commitments or TRIPS-plus conditions. I test all of these measures, yet as the analysis of the economic effects has so far not been related extensively to the effects of IPRs in PTAs, I refrain from formulating a more refined hypothesis on IPR design matter than the direction of the relationship between stringent IPRs and respective factors. Only for the first hypothesis on the effects of investment in R&D, I include an additional hypothesis on enforcement as there has been a previous study showing significant results.

In the following sections, I describe how these factors are operationalised, which explanatory and control variables I use in the analysis, highlight some descriptive statistics, and describe the models I apply for the analysis of the economic effects.

5.2.2 Economic Effects: Data

The data is based on the IPRs in PTAs dataset, which is used for the country and year selection as well as the explanatory variables. Included are only cases of PTAs, which have entered into force, as otherwise, the PTAs should not enfold any lasting economic effects. For the dependent variables, which I describe in the next subchapters, I added data from the World Bank resp. the WIPO database.

The PTA effect analysis usually concentrates on the effects of PTAs on the trade flows in-between PTA members and, therefore, uses a dyadic-format for the data. This is due to the preferential nature of common PTA commitments such as tariffs that are granted (only) to PTA members. By using a dyadic-dataset, the analysis shows the changes amongst the trade flows between PTA members. Unlike conventional effect analyses of PTAs, IPRs in PTAs are granted on an MFN basis and are thus not preferential. The MFN and NT principles granted in TRIPS are strictly speaking only applicable to WTO members, as TRIPS is one of the three pillars of the WTO (besides GATT and GATS). Currently, there are still 34 countries not part of the WTO such as Algeria, Azerbaijan, Belarus, Iran, Iraq and Serbia. Yet some of them are on the accession track and most likely already complying with the MFN commitment. Further, it can be assumed that for IPRs countries make no distinction between WTO members or not, due to their domestic nature. The effects should have a broader range than only in-between PTA partners as the IPR provisions are implemented into domestic law and applicable to all countries, regardless if they are part of the PTA or not. Therefore, I refrain from using a dyadic-format, converted my IPRs in PTAs dataset from a PTA-level to a country-level format and added the data for the dependent variables for all countries included in my dataset. Thus, the effects data is in so far limited as it only includes countries which have signed a PTA, which entered into force. However, as my data also contains PTAs without any IPR, the dataset should at least show if the economic effects are solely due to PTAs or can also be linked to the design of IPRs in PTAs. If the former was true, then there should be no visible variation based on the IPR design, i.e. cases of PTAs with no IPR and cases of PTAs with stringent IPR should show the same effects.

For the description of the dependent variables, I already apply some descriptive statistics for those dependent variables based on the data from the World Bank. The World Bank data has a predefined category of low-, middle- and high-income countries, which I use in the next section to display some of the dependent variables according to the development level over time. This should give some insights on how the development level shapes the discussion on economic effects. However, the classification also shows that there is some missing data for the selected years, mostly for the low-income countries. Therefore, I use for the analysis a further refined classification differentiating between low-middle and upper-middle-income countries.

5.2.2.1 Economic Effects: Dependent Variables

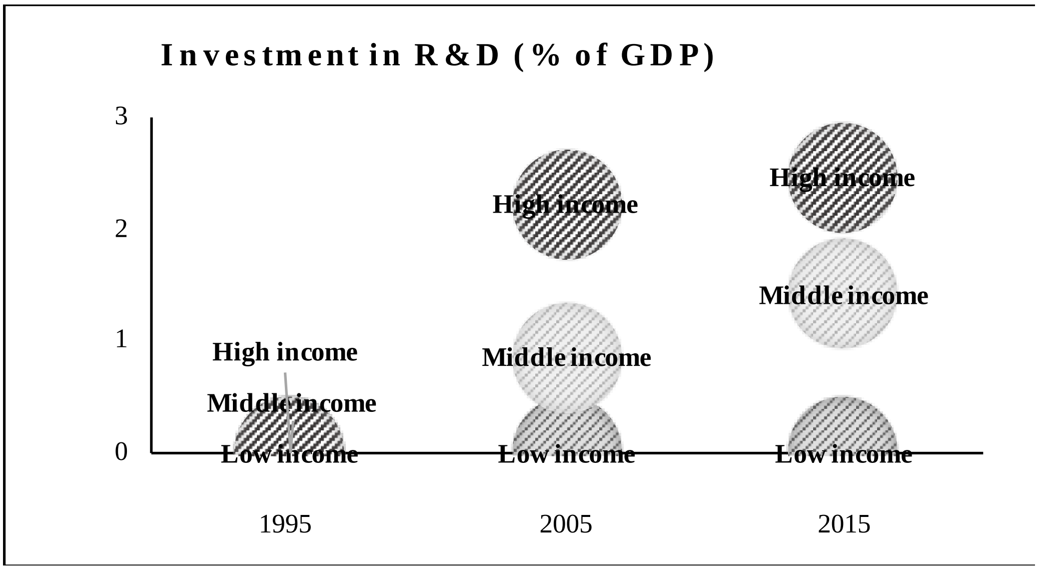
I employ 23 dependent variables for the five factors analysed for the economic effects of IPRs. The measure for the effects is captured by using the delta between the time of PTA signature to five different time lags for each variable. Firstly, I use the delta to the time of the entry into force of the PTA (*df*). Secondly, I use a delta to a three-year-lag (*df3*) and a five-year-lag (*df5*) after the time of entry into force for the short-term and intermediate impact, as well as a delta to a ten-year-lag (*df10*) for the long-term impact. The first time frame represents when the IPR provisions should be in force and could already deploy their effects. However, as the rationale of IPRs argue that the effects of IPRs take some time to unfold, I use three additional lags representing a short-term, intermediate and long-term lag. Thirdly, as some PTAs include an additional transition period for IPR provisions, I include the same delta calculation for each variable reflecting the transition period (*dft*). This means that, for example, the investment in R&D is measured as the change of the variable at the time of entry into force of the PTA to the time of PTA signature: $df = \frac{Investment\ in\ R\&D_{Year\ PTA\ entry\ into\ force}}{Investment\ in\ R\&D_{Year\ PTA\ signature}} - 1$. I apply this calculation to every dependent variable described below for these five time dimensions (*df*, *df3*, *df5*, *df10*, *dft*).

5.2.2.1.1 *Investment in R&D*

For the investment in R&D, I use the data from the World Bank database (World Bank 2018a) on expenditure on R&D ranging from 1960 until 2017. I do not differentiate between public and private investment in R&D as more stringent IPRs should encourage both private as well as public investments.

As previous research has shown, the effects of the identified factors supposedly vary depending on the development status of countries. *Graph 29* displays the development of the investment in R&D over time for the World Bank categories of low-, middle- and high-income countries. For those groups on the zero line of the graph, the World Bank data includes no information. For *Graph 29* this applies to the data for low-income countries and all country groups in the year 1995.

Graph 29: World Development Indicators – Investment in R&D



Graph 29 shows, on the one hand, that middle-income have had a steeper growth in R&D expenditure from 2005 until 2015 than high-income countries. The middle-income countries were thus able to drastically reduce the gap between their share of investment in R&D of the GDP compared to one of the high-income countries. On the other hand, the graph shows that the pre-set development categories by the World Bank might be misleading due to their lack of data for the categories. Nevertheless, the data also show that there seems to be a difference for countries resulting from their development status. Thus, I include a slightly adapted development measure in the control variables to capture these effects in the analysis.

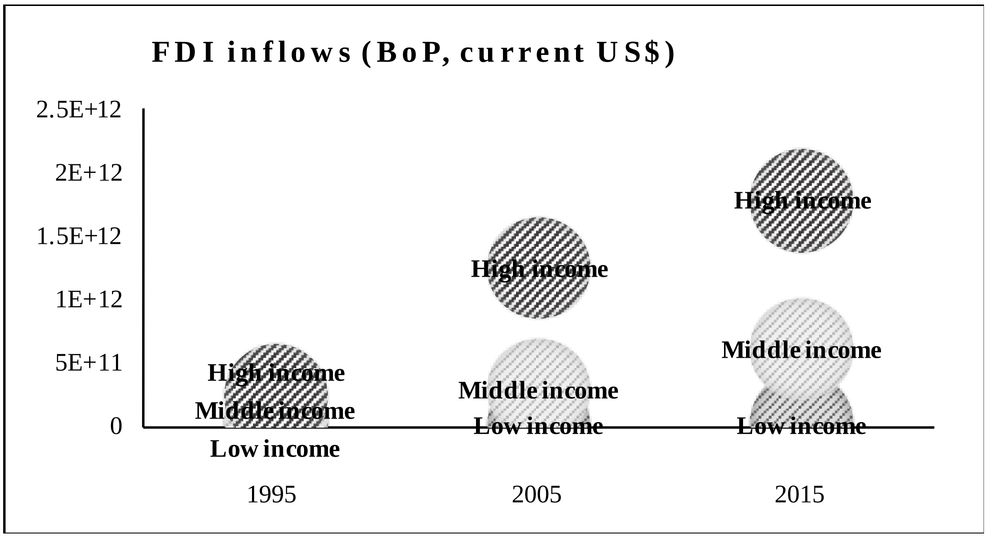
According to the rationale of IPRs, high-income countries would have the highest protection of IPR already before 2005, and middle-income countries would have substantially increased their IPR protection after 2005, leading them to increase their investment in R&D substantially. As there is no data for the top category of low-income countries for the selected years, there can no assumptions be made about their IPR protection standard. The analysis will try to show if it indeed was the increase in IPR protection through PTAs that has positively impacted the increase in investment in R&D.

5.2.2.1.2 FDI/ Licensing

The data for both FDI and licensing are taken from the World Bank database (World Bank 2018a) ranging from 1960 until 2017. For the FDI measure, I use the FDI inflows (BoP, current US$), and for the licensing measure, I use the received charges for the use of IP (BoP, current US$). *Graph 30* illustrates the development of FDI and *Graph 31* the development of licensing according to the development level of countries.

As *Graph 30* on the next page shows, the development of FDI differs from the development of the investment in R&D. The high-income countries seem to have increased their FDI inflows more than the middle-income countries, which are further away from catching up with the high-income countries in 2015 than they were in 2005. The low-income countries are operating on a level that is compared to the other income groups very low. However, looking at the data of only the low-income countries shows that the FDI inflows have quintupled from 1995 to 2005, and again risen by 250% from 2005 to 2015. All of the development categories thus follow an upward trend.

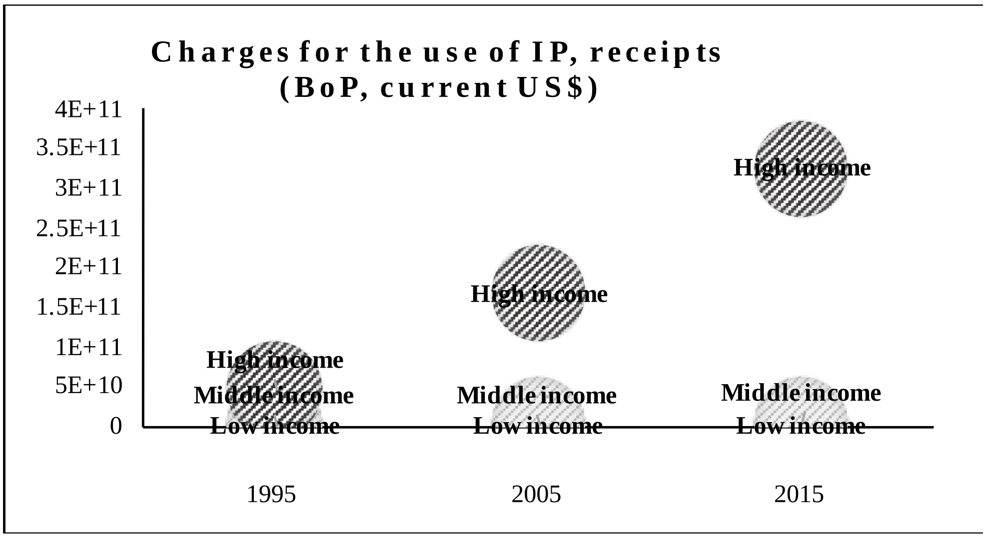
Graph 30: World Development Indicators – FDI



Based on the rationale of IPR, this could indicate that since 1995, when TRIPS entered into force, all countries at least showed some form of IPR protection, which increased their FDI inflows. Moreover, the high-income countries supposedly have substantially increased their IPRs by 2005 and even further in 2015, whereas middle-income countries have started to increase their IPR in 2015. The low-income countries potentially have a low-level of IPR protection, keeping their FDI inflows comparatively low.

For licensing, *Graph 31* shows a slightly different development over time.

Graph 31: World Development Indicators – Licensing



It seems as if there is no data for low- and middle-income countries, when in fact there is, just on a much lower level than for high-income countries. It is apparent that the high-income countries show the steepest increase of payments received for licensing over time and that the distance towards low-and middle-income countries widens continuously. By 2015, the low- and middle-income countries are farthest away from catching-up on licensing fees. Looking at their development in more detail, it shows that the low-income countries have made substantial increases from 1995 to 2005 (2614%) and then almost stagnated from 2005 to 2015 (11%). The received payments for IP charges of middle-income countries had quadrupled from 1995 to 2015 and then almost doubled again from 2005 to 2015 (146%).

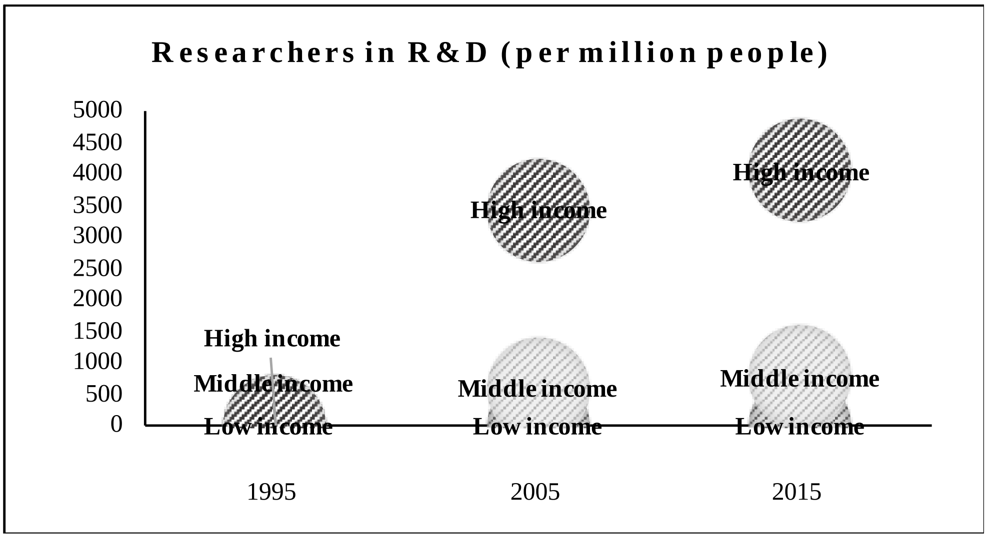
According to the rationale of IPRs, this indicates that high-income countries show the most stringent IPR protection and keep on increasing it over time. Both the middle- and low-income countries have increased their IPR protection after 1995, whereby the low-income countries have adapted their IPR regulation more extensively, leading to a substantial increase in the received licencing fees until 2005. After then, the rationale suggests that the low-income countries have not further increased their IPR protection or only on a marginal level, whereas the middle-income countries further increase their IPR protection. Again, these are only assumptions on the effects of IPRs, which are tested in the analysis.

5.2.2.1.3 Innovation

There are different studies on innovation, which often differ in the way they operationalise innovation. For a long time, the investment in R&D was used as a proxy for innovation, often in relation to GDP. However, more recent studies argue that there are other factors more ideally suited to capture innovation, such as patent applications by residents (see Branstetter, Fisman, and Foley 2006; P. H. Schneider 2005). Based on these studies, I focus on four factors to measure innovation: researchers in R&D, and resident applications for trademarks, industrial designs and patents.

The measure for researchers in R&D (per million people) is taken from the World Bank database (World Bank 2018a) ranging from 1960 until 2017. *Graph 32* shows the development of the number of researchers according to the development level of countries. However, there is no data for all country groups in the year 1995 and also no data for the low-income countries for the other selected years. Nevertheless, the data shows that the high-income countries operate on a substantially higher level than the middle-income countries. Further, they show a steeper increase from 2005 to 2015 and widen the distance to middle-income countries.

Graph 32: World Development Indicators – Innovation



According to the IPR rationale, the impact of stringent IPR regulation would unfold with a certain lag. *Graph 32* would indicate once more that high-income countries already had a more stringent IPR protection before 2005 and further increased it over time, whereas middle-income countries operate on a substantially lower level of IPR protection and marginally increased it over time.

For the resident applications of trademarks, industrial designs and patents, I use the data of the WIPO Intellectual Property Statistics Data Center (World Intellectual Property Organization 2018a). To capture the growth over time, I use a cumulative measure of residential IPR applications.

5.2.2.1.4 Technology Transfer

Previous research on the effects of IPRs has operationalised technology transfer in various ways. Most studies use data on either FDI and licensing or exports respectively imports (Maskus 2012, 75 Table 2.7). I use FDI and licensing as standalone factors and consider them to be only indirect measures of technology transfer because they are not necessarily linked to technology transfer. For example, by using copyright-protected music and paying charges for it, there is hardly any transfer of technology involved. As argued previously, I consider the applications for those IPRs including an obligation to disclose to be a far more representative and observable measures of technology transfer. I thus look at imports of IPR-intensive goods, which has already been used in previous research, and IPR applications as a measure for technology transfer.

For the IPR applications, I use the total applications for industrial designs and patents as well as the applications for industrial designs and patents by PTA members. The application data is provided by the WIPO Intellectual Property Statistics Data Center (World Intellectual Property Organization 2018a) for all of these four variables. The delta is calculated based on the cumulative measure of applications.

For the IPR imports, I also look at the total as well as the imports by PTA members. The design analysis has already shown that it is important for IPR research to differentiate according to the technology-intensiveness of goods. For instance, Manger (2009) states that it is more likely for developing countries to export low-technology goods and for developed countries high-technology goods:

> *"Capital-intensive production takes place in developed countries that offer access to high technology and research and design facilities and personnel. Labor-intensive stages of production are outsourced to the developing world. This vertical fragmentation of production leads to an increase in intra-industry trade, or trade in the same industry in differentiated goods. Unlike intraindustry trade between developed countries, however, the traded goods are differentiated by "quality": developing countries are more likely to export low-cost goods, while developed countries export highcost, high-quality goods. For example, while many car manufacturers produce their upscale vehicles in their home country, entry-level cars are produced in less developed countries."* Manger (2009, 16)

It is thus more likely that stronger IPR protection will have a positive effect on already stronger sectors. For instance, a positive effect on low-technology imports from developing countries and high-technology imports from developed countries. To reflect the various IPR-related sectors, I differentiate between products with a high, medium-high, medium-low and low technology-intensiveness (*htp*, *mhtp*, *mltp*, *ltp*) for both total imports and imports by PTA members (see *Table 25: Nomenclature for Technology Intensiveness of Goods*). The data is derived from the World Bank's World Integrated Trade Solutions (WITS) database (World Bank 2018b).

5.2.2.1.5 Growth

Previous studies on the effects of IPR on growth such as Gould and Gruben (1996), Park (1999), and Falvey et al. (2004) operationalise growth as the average annual GDP per capita. For my analysis, I operationalise growth in four manners: by looking at the delta of GDP, GDPpc, GDP growth rate and GDPpc growth rate. The GDP and GDP growth rate show the economic growth of a country, whereas the GDPpc and GDPpc growth rate show the country's level of development. The data is downloaded from the World Bank database (World Bank 2018a) ranging from 1960 until 2017.

5.2.2.2 Economic Effects: Explanatory Variables

The explanatory variables are solely based on the design of IPRs in PTAs. Similar to Kim (2015), who compares those PTAs with stringent IPR provisions to those without stringent IPR provisions, I analyse if the design of IPRs in PTAs affects the dependent variables. Based on the rationale of IPRs in PTAs (see *2.2.1.3 Rationale of IPRs in PTAs*), I expect there to be a difference between those PTAs, which include no IPRs, general IPR, specific IPRs and TRIPS-plus provisions.

I use the same variables, which I used as dependent variables for the design analysis. For general IPR, I use the Index IPR general, Index IPR scope mentioned, binary variables for IPR scope mentioned, Index IPR general enforcement and the Index IPR multilateral coherence dummy. For stringent IPR, I use the index IPR specific, Index IPR scope tangible, binary variables for IPR scope tangible, Index IPR specific enforcement, Index IPR multilateral coherence, Index TRIPS-plus, and additive variables for TRIPS-plus categories. Additionally to the stringent variables, I test the Index IPR DSM and for enforcement the Index IPR general enforcement, Index IPR specific enforcement and Index IPR enforcement.

As shown in the legal-institutional analysis, one of the core problems of the effect analysis is the lack of knowledge about the effectiveness of commitments on IPRs in PTAs. Without a domestic IPR dataset matching the PTA provisions, there is no knowledge on which IPR provisions actually require a change in domestic regulation and which commitments simply repeat the status quo. In theory, also these latter non-commitments and repetitions could have an economic effect by reinsuring the stability of the IPR system and its values. However, as long as there is no domestic data on IPRs, there is no ideal control for this effectiveness issue. I deal with this effectiveness issue in two manners. Firstly, I use the design features and assume that there is an effect regardless if the commitments require a change in that status quo or not (*overall*). Secondly, I create an additional measure based on the design features, which only accounts for the design features in the first PTA per country (*first-comer*). For example, if a country has two PTAs including TRIPS-plus provisions on patents, I account for them in the PTA entering into force first. For the second PTA, it would be a non-commitment, as the provisions should have been already implemented at the time the first PTA entered into force. The first-comer IPR measurement is thus a more conservative approach than the overall IPR measure. Conclusively, I run separate models for the overall and first-comer IPR measures and per model include either general, specific or TRIPS-plus provisions.

5.2.2.3 Economic Effects: Control Variables

I use the same seven control measures as for the analysis of the design (*4.2.3 Control Variables*). Namely, I include for each country the annual score for democratisation (Polity 2); a variable accounting for IPR-interested PTA members for the three IPR country blocks *classic IP leaders*, *countries with a high increase of patent protection* and *new IP* *producers and developers*; the annual GDP and GDPpc (log); as well as the average geographic distance between PTA members. The variables are measured at the time of entry into force of the PTA. For the data of the country blocks and the average geographical distance, I use the measures of the PTA-level dataset.

The descriptive graphs shown before already indicate that the dependent variables developed differently according to a countries' development level. As the previous research has suggested, the effect of IPRs might differ based on the development level of countries. For example, in the case of patent protection, it might be that low-income countries have a lower risk of reverse-engineering. Thus, IPR protection might not play a substantial role because the means for IPR infringement are not given. Yet the effect of stronger patent protection should be visible for middle- and high-income countries with actual capabilities of infringing on patents (see Fink and Maskus 2005, 7). Therefore, I will test the models additionally for four different development level:. low-income, lower-middle-income, upper-middle-income and high-income countries. The classification is based on the World Bank Analytical Classifications (World Bank 2018a). As described before, the World Bank data already comes with a classification of low-, middle- and high-income countries, which I used for the previous descriptive graphs of some of the dependent variables. However, this classification generates more missing data than the more fine-grained classification, which is thus preferable. The development level is already represented by the GDP variables, thus the levels are not included in the normal regression model. Rather, I run separate models for subgroups of the data according to the development level of countries.

5.2.2.4 Economic Effects: Descriptive Statistics

In total, the data includes 3'833 data entries for 201 countries covering 632 PTAs, which entered into force between 1949 to 2018. The data entries include mostly data entries for high-income countries (1844; 48%), whereas the other development groups for upper-middle-income countries (642; 17%), lower-middle-income countries (627; 16%), and low-income countries (501; 13%) are more equally distributed in the dataset. 219 data entries of countries are unclassified due to NAs in the World Bank classification (6%).

The descriptive statistics for the dependent variables are co-dependent on the time dimension, i.e. for the smaller time lags (*df*) there are generally more observations than for the greater time lags (*df10*). *Table 67* displays thus the values for the *df* time dimension to give some insights on the descriptive statistics of the dependent, explanatory (IPR overall) and control variables. It shows that most of the dependent variables only have limited data availability. When looking at time dimensions further in the future, this issue grows even more pronounced, especially for PTAs that have entered into force only recently. However, there is still a substantial amount of data entries, which allow for a reliable statistical analysis.

For the dependent variables on researchers in R&D and IPR-intensive imports, the number of data entries drops to as low as 584 (15% of all data entries). The effects of IPRs in PTAs on these dependent variables might thus be less generalisable than anticipated. For the other variables, the number of observations is substantially higher, and the results cover the majority of data entries.

Table 67: Descriptive Statistics for the Economic Effects Data

Variables	N	Min	Max	Median	Mean	Std.Dev.
Dependent Variables						
Investment in R&D						
Investment in R&D	1124	-0.82	10.88	0.01	0.05	0.37
FDI/ Licensing						
FDI	3182	-1157.88	4999.09	0.00	5.39	140.08
Licensing	1835	-0.99	13685.85	0.07	8.28	319.52
Innovation						
Researchers in R&D	945	-0.77	2.96	0.04	0.07	0.18
Resident applications for trademarks (cumulative)	2853	0.00	914.60	0.14	1.28	21.38
Resident applications for industrial designs (cumulative)	2474	0.00	288.99	0.10	1.15	10.61
Resident applications for patents (cumulative)	2735	0.00	217.50	0.11	0.45	4.48
Technology Transfer						
Total applications for industrial designs (cumulative)	2268	0.00	330.66	0.08	0.50	7.31
Total applications for patents (cumulative)	2691	0.00	280.64	0.05	0.26	5.45
PTA member applications for industrial designs (cumulative)	1007	-1.00	167.00	0.00	1.38	10.42
PTA member applications for patents (cumulative)	1153	-1.00	2999.00	0.05	10.97	156.81
Total *htp* imports	796	-1.00	54.16	0.09	0.40	3.37
Total *mhtp* imports	796	-1.00	46421.49	0.07	58.61	1645.36
Total *mltp* imports	796	-0.91	9.00	0.09	0.21	0.60
Total *ltp* imports	796	-0.77	7.24	0.08	0.20	0.54
PTA member *htp* imports	754	-1.00	2540945.43	0.06	4504.42	94272.17

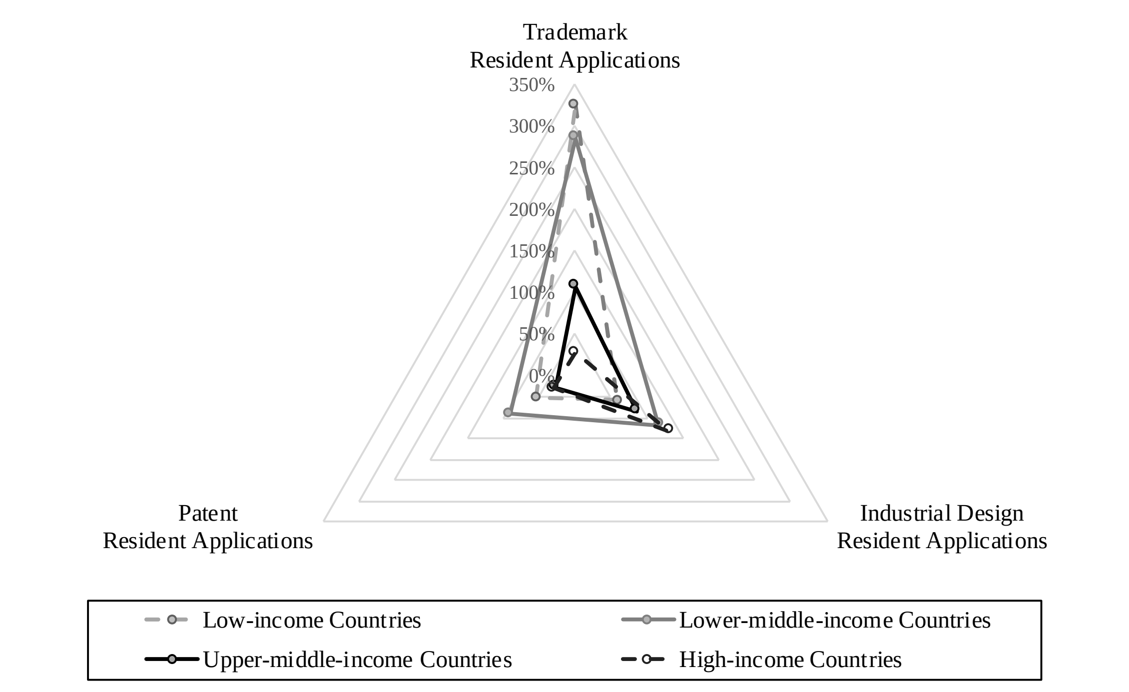
Variables	N	Min	Max	Median	Mean	Std.Dev.
PTA member *mhtp* imports	741	-1.00	97137.20	0.09	369.09	5024.37
PTA member *mltp* imports	757	-1.00	244216.74	0.05	1782.86	17969.90
PTA member *ltp* imports	584	-1.00	244216.74	0.09	2236.55	20394.11
Growth						
GDP growth	3583	-0.75	5.71	0.06	0.12	0.28
GDPpc growth	3583	-0.76	5.31	0.04	0.10	0.26
GDP growth rate	3430	-202.86	283.03	0.00	0.12	11.46
GDPpc growth rate	3434	-1603.58	2106.90	-0.03	0.34	49.47
Independent Variables (Overall)						
IPR Indexes						
Index IPR general (sum)	3833	0.00	24.00	3.00	6.28	6.94
Index IPR specific (sum)	3833	0.00	15.00	0.00	1.87	3.81
Index IPR TRIPS-plus (sum)	3833	0.00	39.00	0.00	4.09	9.68
Binary & Additive Variables of Indexes						
Index IPR general (sum)	see *Appendix 60: Descriptive Statistics for the Economic Effects Data – Binary & Additive Variables of Indexes*					
Index IPR specific (sum)						
Index IPR TRIPS-plus (sum)						
Control Variables						
Democratisation (Polity 2)	3318	-10.00	10.00	9.00	5.42	6.47
Classic IP leaders	3833	0.00	1.00	0.00	0.49	0.50
Countries with a high increase of patent protection	3833	0.00	3.00	0.00	0.14	0.49
New IP producers and developers	3833	0.00	2.00	0.00	0.12	0.39
ln GDP	3613	16.05	30.45	24.64	24.43	2.53
ln GDPpc	3613	3.72	12.10	8.75	8.61	1.69
ln Geographic distance (mean)	3511	4.11	9.89	7.42	7.55	0.89

The descriptive statistics of the independent variables and control variables has changed slightly compared to the design analysis (see *4.2.4 Design: Descriptive Statistics*) due to the conversion from PTA-level to the country-level format of the data. The details of the IPR general and specific binary variables, as well as the IPR TRIPS-plus additive variables, are listed in the appendix due to their extensiveness. In the following paragraphs, I show descriptive graphs for some of the dependent variables in relation to the income level of countries, because previous research has shown that the effects of IPRs vary according to the income level of countries. Therefore, I illustrate those variables, which I have not displayed in the previous subchapters and differentiate between low-income, lower-middle-income, upper-middle-income and higher-income countries.

Firstly, I look at innovation using IPR applications by residents (*Graph 33*). Secondly, I display the technology transfer using IPR applications (*Graph 34*) as well as IPR-intensive imports (*Graph 35*, *Graph 36*). Thirdly, I highlight the development of growth over time using GDP (*Graph 37*) and GDP per capita (*Graph 38*).

Graph 33 shows the *df* delta (see *formula*) of the average cumulative resident applications for trademarks, industrial designs and patents according to the development level of countries.

Graph 33: Resident IPR Applications by Development Level

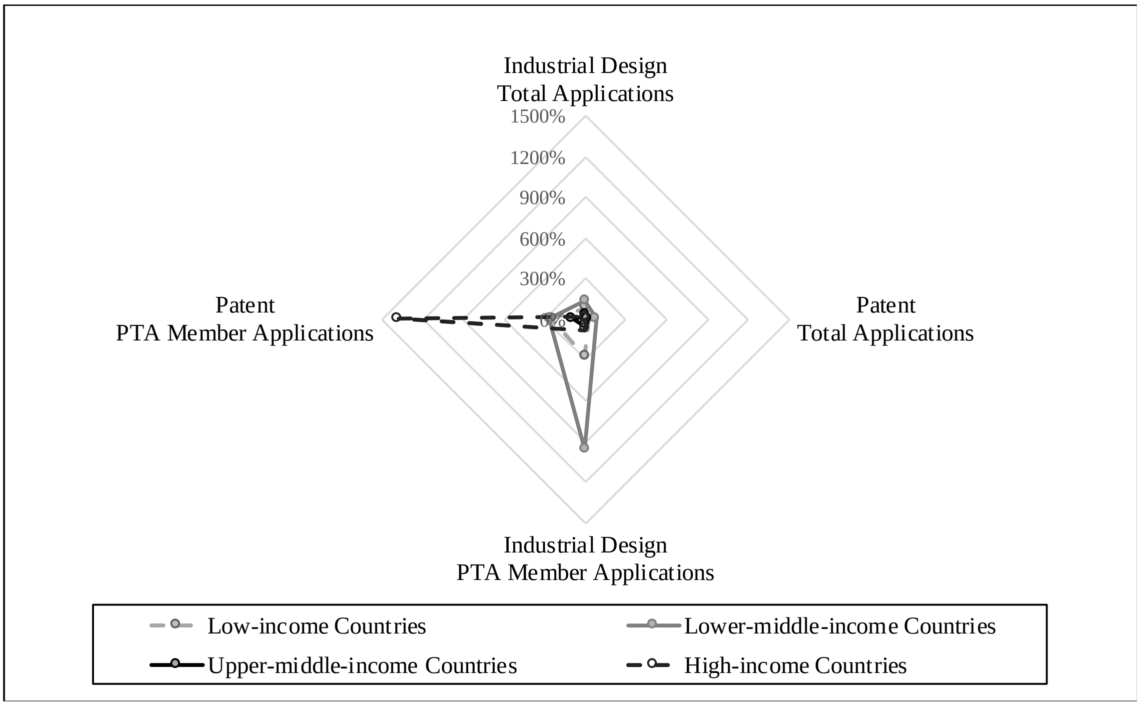


The graph shows that the most pronounced increase in resident applications is visible for trademarks. Particularly, low- and lower-middle-income countries' residents increase their trademark applications immensely from the time of PTA signature compared to the time of the entry into force of the PTA. The analysis will shows if this increase is connected to the design of IPRs in PTAs or might be coincidental. Lower-middle-income countries show overall the highest increase in IPR-applications by residents. This suggests an increased innovative domestic activity for goods protected by trademarks, industrial designs and patents at the time of entry into force of a PTA. The residential applications by upper-middle- and higher-income countries are far less pronounced. For patents, there is almost no increase, whereas upper-middle-income countries' residents increase their applications for trademarks, and high-income countries' residents increase their applications for industrial designs. The innovation in connection with PTAs seems thus more likely to be connected to trademarks and industrial design for developed countries, whereas innovation of patents is also relevant in lower-middle-income countries.

Graph 34 displays four measures of technology transfer: the *df* delta of the total cumulative applications as well as applications by PTA members for each industrial designs and patents.

The graph illustrates that the total applications of both industrial designs as well as patents are only marginally impacted for all development levels of countries. However, looking at patent applications by PTA members, the graph shows that there is an immense increase in high-income countries at the time of entry into force of the PTA compared to the time of PTA signature. This is in so far astonishing, as the high-income countries most likely already ensured a similar IPR protection domestically and the PTA most likely did alter the IPR regulation only marginally. Thus, the increase might not be only connected to the design of IPRs in PTAs and rather to other PTA factors. The other income-level countries also show an increase of patent applications by PTA members, yet on a much lower level than high-income countries. A similarly pronounced increase can be observed for industrial design applications by PTA members in lower-middle-income countries, and on a lower level also in low-income countries. This could suggest that after more stringent IPR protection is granted in the PTA, PTA members are more likely to protect industrial designs in lower-middle-income and to a lesser extent in low-income countries.

Graph 34: Total and PTA Member IPR Applications by Development Level

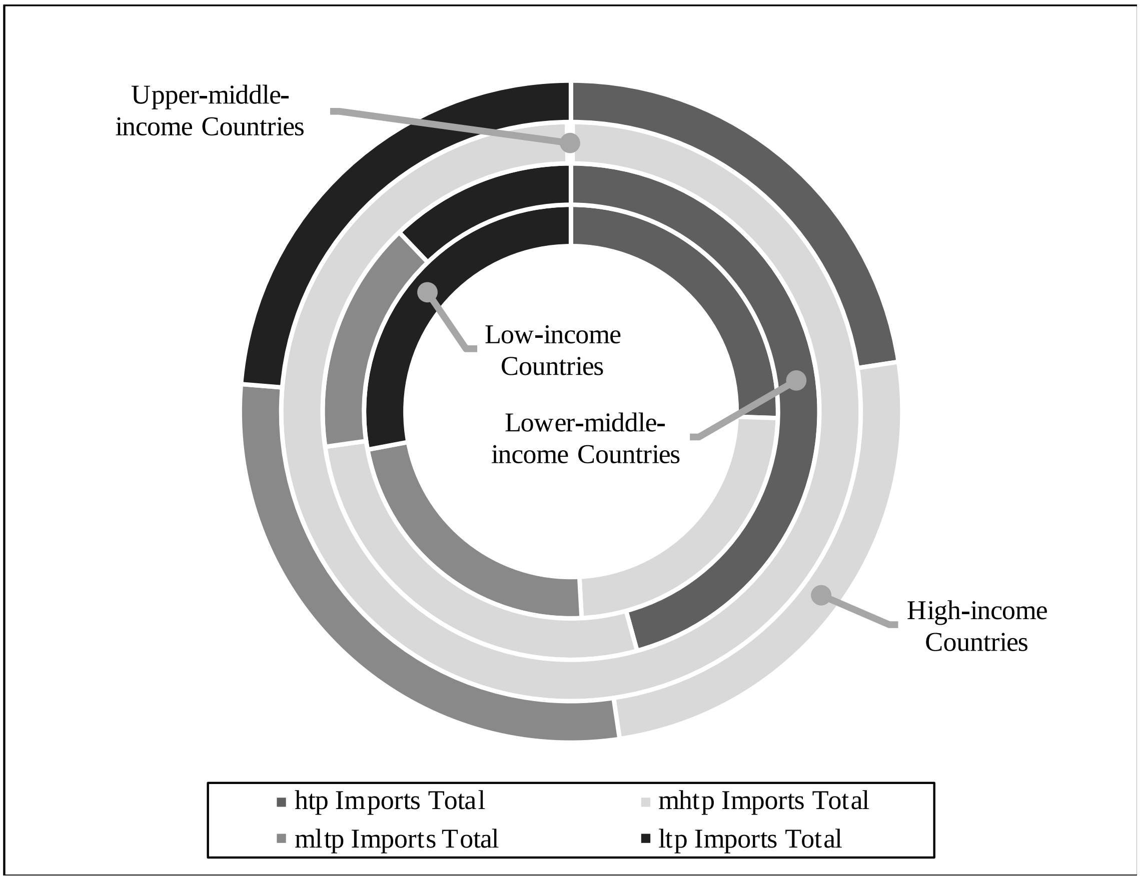


Graph 35 shows the delta (*df*) of the average total IPR-intensive imports differentiated by colour (see legend). The rings represent the development level of countries, whereby the inner circle represents the values of low-income countries, followed by lower-middle-income countries, upper-middle-income countries and the outmost ring the high-income countries.

The graph shows that total *mhtp* imports play an important part across all countries' development levels. For upper-middle-income countries, they show by far the most relevant increase (*df*) across all imports, almost diminishing the other coloured bars. For high- and low-income countries, the positive effect on imports is almost equally distributed across the IPR-intensiveness forms. For lower-middle-income countries, *htp* imports increase the most, followed by *mhtp* imports, whereas *mltp* and *ltp* imports are less increased. If these results are connected to the IPR design, then it could, for example, mean that more stringent IPR protection immensely increase *mhtp* imports in upper-middle income countries.

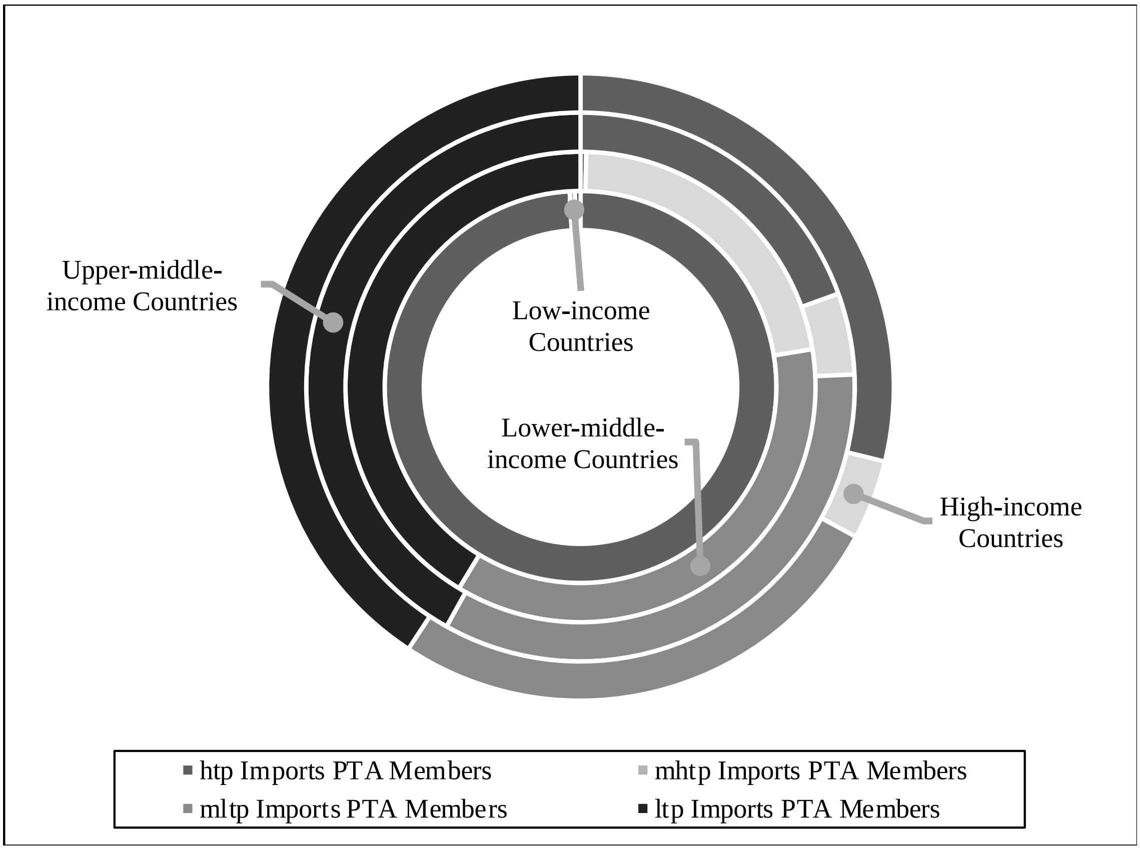
Similar to the total imports illustrated in *Graph 35*, *Graph 36* shows the delta (*df*) of the average IPR-intensive imports by PTA members differentiated by colour.

Graph 35: Total IPR-intensive Imports by Development Level



The picture for IPR-intensive imports by PTA members differs from the one for total imports. Here, the increase of *mhtp* imports is only sizeable for lower-middle-income countries. For low-income countries, it is mostly *htp* imports by PTA members, which increase immensely between the time of PTA signature and the entry into force of the PTA (*df*). For all other development levels, the most increase can be seen for *ltp* imports and *mltp* imports by PTA members. For high- and upper-middle-income countries, *htp* imports by PTA members also increase substantially, yet they are only marginally important in lower-middle-income countries. Again, if these developments in the dependent variable are affected by the IPR design, it could be that, for instance, the PTA provisions and the following implementation of more stringent IPRs in low-income countries have a strong positive effect on *htp* imports from PTA members. The analysis will test if the observable changes in the imports are statistically related to stringent IPRs in PTAs, or if IPR design in general matters to the development of IPR-intensive imports.

Graph 36: IPR-intensive Imports from PTA Members by Development Level

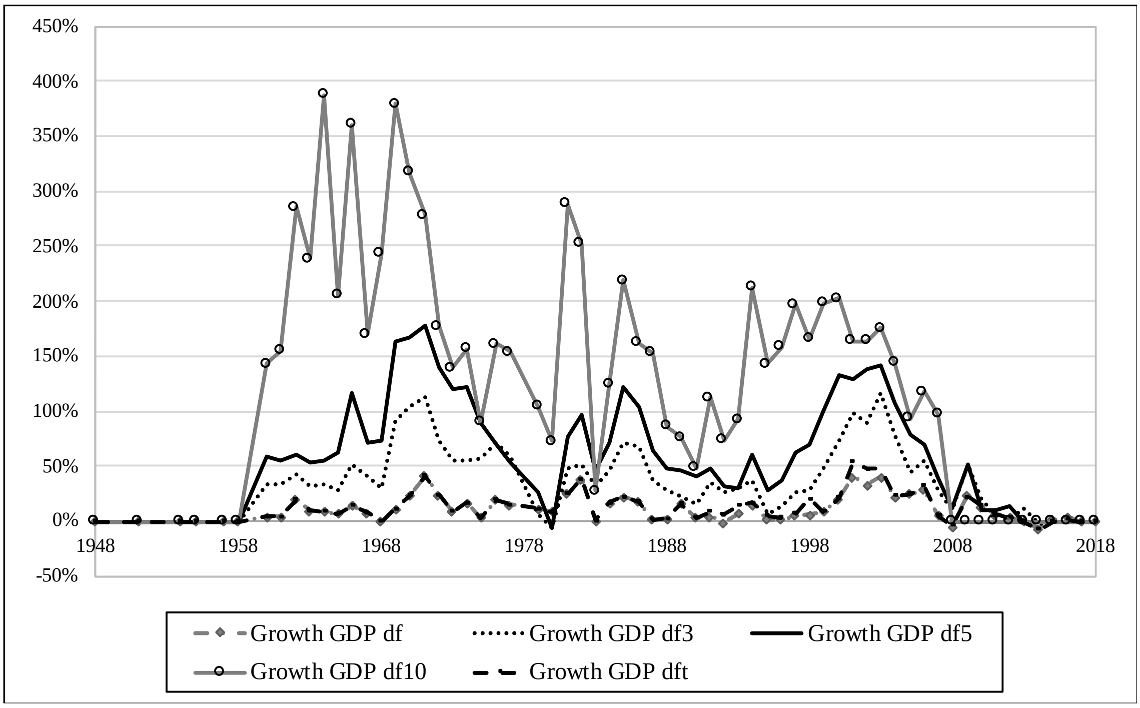


Finally, *Graph 37* and *Graph 38* display the average development of growth for the five delta time dimensions over time. They show that the development of growth is not only yet predominantly positive.

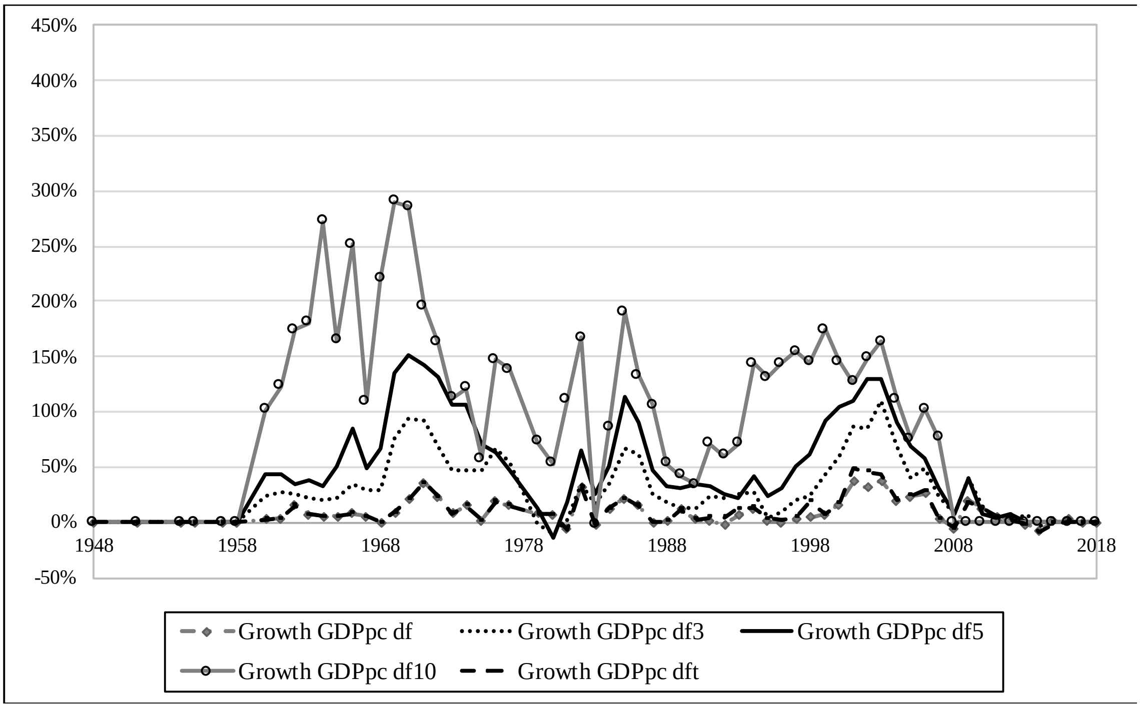
The years in the graph represent the year of PTA signature, which is the constant year across deltas. The GDP and GDPpc data is only available for the years between 1960 and 2017, which means that PTAs signed before 1960 are not represented and, for example, PTAs signed after 2007 have no data for the ten-year lag. The beginning and end of the graphs are thus flat due to a lack of data availability. However, the score after 2007 of the *df* and other time-lags is mostly available, yet is indeed operating on a comparatively lower level.

Overall, the graphs show that the development of growth for GDP and GDP per capita are highly similar, whilst growth by GDPpc is operating at a slightly lower level than GDP. For both measures, the highest increase in growth can be observed for the delta with the ten-year lag after the entry into force of the PTA (*df10*). Similar developments are shown by the five-year lag delta (*df5*) and the three-year lag delta (*df3*) but on a lower level. The difference between the measure of growth with the time of entry into force (*df*) compared to the time of the transition period (*dft*) is less pronounced than anticipated, yet at certain points in time the delta for the transition period tends to score slightly higher (approximately 10%).

Graph 37: Development of Average GDP by the Five Time Deltas (*df, df3, df5, df10, dft*)



Graph 38: Development of Average GDPpc by the Five Time Deltas (*df, df3, df5, df10, dft*)



Graph 37 shows that there are certain peaks of PTAs signed in particular years. Looking at the ten-year lag (*df10*), it starts with PTAs signed in 1962 and peaks in 1964 and with some turbulence reaches a similar level again until 1969. These years of PTA signature show long term the most positive growth delta Then growth drops significantly for PTAs signed afterwards, only rising again in 1982 and 1985 before deflating again. With the agreements around the time of the TRIPS signature in 1994, the long-term growth increases to a highly consistent level until PTAs signed in 2003. The following drop might be overrepresented due to the missing data for the ten-year lag after 2007. The shorter time-lags show that mid-term growth is also highest for those PTAs signed in 1970, 1986, and 2002-2003. However, the highly positive delta seen in the early 60ies and 90ies are only visible for the long-term perspective and are less relevant for the short- and mid-term growth.

These development graphs alone give no indication on the impact of the design of IPRs in PTAs. The postulated effect of more stringent IPR provisions increasing growth is not apparent by looking at these graphs, as it is mostly PTAs after 2000, which include stringent IPRs (see *Graph 1: Development of IPRs in PTAs (cumulative)*). I elaborate in the following paragraphs on the models used for the analysis, before looking for explanations for the descriptive statistics shown above and testing the postulated hypotheses.

5.2.2.5 Economic Effects: Models

In total, I run 1'380 models for the economic effects: 12 models according to the overall and first-comer IPR explanatory variable selection for each of the 23 dependent variables for each of the five time dimensions. Kepaptsoglou et al. (2010 Table 1) show that most of the previous studies for the effects of PTAs, which used a gravity model to explain the effect on trade flows, applied an OLS model respectively an OLS model with fixed effects. Therefore, I will also run my models using OLS regression. *Figure 19* on the next page displays the model specifications.

There is some loss of coded PTAs due to missing values in the dependent variables, especially for the greater time lags (five years and ten years). The regression tables will include the number of observations, which vary not only across variables but also time dimensions. Additionally, to the models shown in *Figure 19*, I also run the models including only the subsets of the four country development levels (low-, lower-middle-, upper-middle- and high-income) to see if the effects are driven by a certain development level of countries.

Figure 19: Economic Effects Model Specifications

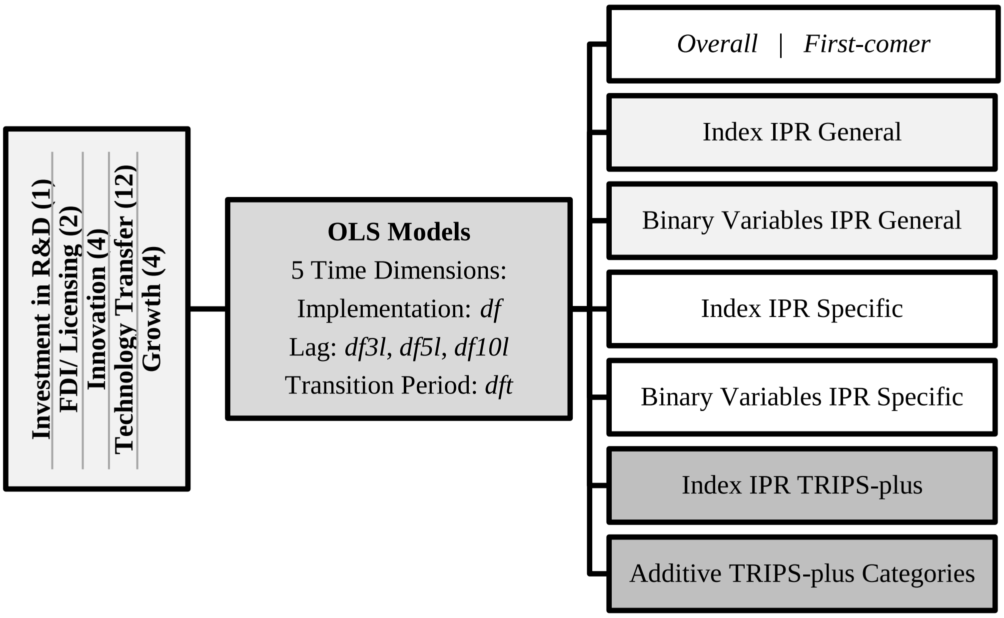


Table 68 presents a model overview for the economic effect analysis, lists the 23 dependent variables run for five time dimension (1x5), the six independent variable combinations run once for overall (O) and once for first-comer (FC) measurements of the design variables (6x2). The model fits of the dependent variables affected significantly by at least one IPR explanatory variables are included in the *Appendix 61: Model Fit of Economic Effect Analysis (AIC & BIC)*.

Table 68: Model Overview for Economic Effect Analysis

Variables	Number of DVs	Variations	Number of Models	Model Label
Dependent Variables (DVs)	**115**		**1’380**	
Investment in R&D				
Investment in R&D	1x5	6x2	60	m1
FDI/ Licensing				
FDI	1x5	6x2	60	m2.1
Licensing	1x5	6x2	60	m2.2
Innovation				
Researchers in R&D	1x5	6x2	60	m3.1
Resident applications for trademarks (cumulative)	1x5	6x2	60	m3.2
Resident applications for industrial designs (cumulative)	1x5	6x2	60	m3.3

Variables	**Number of DVs**	**Varia-tions**	**Number of Models**	**Model Label**
Resident applications for patents (cumulative)	1x5	6x2	60	m3.4
Technology Transfer				
Total applications for industrial designs (cumulative)	1x5	6x2	60	m4.1
Total applications for patents (cumulative)	1x5	6x2	60	m4.2
PTA member applications for industrial designs (cumulative)	1x5	6x2	60	m4.3
PTA member applications for patents (cumulative)	1x5	6x2	60	m4.4
Total *htp* imports	1x5	6x2	60	m4.5
Total *mhtp* imports	1x5	6x2	60	m4.6
Total *mltp* imports	1x5	6x2	60	m4.7
Total *ltp* imports	1x5	6x2	60	m4.8
PTA member *htp* imports	1x5	6x2	60	m4.9
PTA member *mhtp* imports	1x5	6x2	60	m4.10
PTA member *mltp* imports	1x5	6x2	60	m4.11
PTA member *ltp* imports	1x5	6x2	60	m4.12
Growth				
GDP growth	1x5	6x2	60	m5.1
GDPpc growth	1x5	6x2	60	m5.2
GDP growth rate	1x5	6x2	60	m5.3
GDPpc growth rate	1x5	6x2	60	m5.4

5.2.3 Economic Effects: Analysis

The order for the economic effect analysis follows the five factors investment in R&D (*5.2.3.1*), FDI and licensing (*5.2.3.2*), innovation (*5.2.3.3*), technology transfer (*5.2.3.4*), and growth (*5.2.3.5*). I display those regression tables, which show a significant result for the IPR indexes and include the significant regression tables for the binary and additive variables in *Appendix 62: Economic Effect Regression Tables of the Binary Variables for IPR General*, *Appendix 63: Economic Effect Regression Tables of the Binary Variables for IPR Specific*, resp. *Appendix 64: Economic Effect Regression Tables of the Additive Variables for the TRIPS-plus Categories*. Further, I display the significant effects of the IPR indexes according to the development of countries in *Appendix 65: Significant Models of High-income Countries (HIC)*, *Appendix 66: Significant Models of Upper-middle-income Countries (UMIC)*, *Appendix 67: Significant Models of Lower-middle-income Countries (LMIC)*, resp. *Appendix 68: Significant Models of Low-income Countries (LIC)*.

The regression analysis shows that not all of the factors are generally affected by IPRs in PTAs. For example, there are no significant results of IPR provisions on FDI, resident applications for trademarks nor the total applications for trademarks and patents. However, IPR has an effect on these factors, if one separates the dataset according to the level of development of countries.

For those factors generally impacted by IPRs, the design of IPRs in PTAs shapes the direction of the effect, whereby all of the IPR indexes – general, specific and TRIPS-plus – show significant effects on multiple factors. However, some of the significant results observed for IPRs are surpassed by the effect of the control variables included in the model or are highly marginal. For instance, the impact of the IPR indexes on technology transfer measured by the total *htp* and *mltp* imports has significant estimates scoring below *1.02E-09*. Furthermore, the results vary according to the development level of countries, with high-income countries being affected most often across all factors and lower-middle-income countries the fewest. Again, these results according to the development level have to be used with precaution as the number of observations is in some cases insufficient for general statements. Overall, those factors affected the most by IPR measures are licensing and technology transfer, namely PTA member applications for industrial designs and patents, total *mhtp* and *ltp* imports, and PTA member *htp*, *mhtp* and *mltp* imports.

5.2.3.1 Investment in R&D Economic Effect Analysis

The analysis of the effects of IPR on investment in R&D shows highly mixed results across the different deltas and IPR measures. Only two of the overall IPR measures have a significant effect, whereas the first-comer IPR measure has multiple significant results. In summary, the significant effects of IPR on investment in R&D are predominately negative. *Table 69* displays the significant effects for the overall IPR measure on the left-hand side and on the right-hand side, the ones for the comparable time lag for the first-comer IPR measure.

For the overall IPR measure, there are only these two displayed significant results, whereby the index IPR general has a positive effect (*estimate = 0.025*) after a ten-year lag, and the index IPR specific has a negative effect after the transition period has passed (*-0.003*). This means that an increase of general IPR provisions in PTAs has a positive effect on the investment in R&D after ten years of the PTA entering into force whilst an increase of specific provisions decreases the investment in R&D after the IPR transition period has ended. However, the number of observations of *df10l* (*N = 433*) is comparatively low and might not reflect a generalisable positive effect, especially considering the significant results of the first-comer IPR models. As the effects on the right-hand side show, the results for the transition period of the first-comer IPR measure are similar. The ten-year lag for the FC models shows no significant (positive nor negative) effect, yet the transition period models display significantly negative results for both the index IPR general (*-0.008*) as well as index IPR specific (*-0.01*).

Table 69: Economic Effects Regression – Investment in R&D, IPR Indexes I

	Overall IPR		First-comer IPR	
	df10l	*dft*	*dft*	
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	0.025* (0.012)	—	-0.008* (0.003)	—
Index IPR specific (sum)	—	-0.003. (0.002)	—	-0.01. (0.006)
Index IPR TRIPS-plus (sum)	—	—	—	—
Control Variables				
Democratisation (Polity 2)	-0.029. (0.017)	0.002 (0.002)	0.001 (0.002)	0.002 (0.002)
Classic IP leaders	0.15 (0.227)	0.073*** (0.02)	0.069*** (0.019)	0.075*** (0.02)
Countries with a high increase of patent protection	0.178 (0.178)	-0.024 (0.018)	-0.024 (0.018)	-0.021 (0.018)
New IP producers and developers	0.045 (0.265)	0.037* (0.018)	0.032. (0.018)	0.038* (0.018)
ln GDP	-0.059 (0.047)	-0.001 (0.005)	-0.001 (0.005)	-0.002 (0.005)
ln GDPpc	-0.046 (0.101)	-0.022** (0.008)	-0.024** (0.008)	-0.024** (0.008)
ln Geographic distance (mean)	-0.183* (0.092)	0.028** (0.009)	0.025** (0.008)	0.024** (0.008)
Intercept	3.598** (1.186)	0.017 (0.106)	0.076 (0.104)	0.071 (0.104)
Model	m1_df10l_gi	m1_dft_si	m1_fc_dft_gi	m1_fc_dft_si
Observations	433	817	817	817

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Table 69 also shows that some of the control variables have a more pronounced effect on the investment in R&D than the IPR indexes. The classic IPR leaders, for example, score for all *dft* models significant and substantially higher than the IPR indexes, meaning that if the US, EU, EFTA or Japan are members of a negotiated PTAs than there is a positive effect on the investment in R&D after the transition period has ended. A similar effect on a lower level can be observed for the new IP producers and developers Israel, South Korea, Singapore and Taiwan. A consistently negative effect is shown for the GDP per capita (log) measure, indicating that with an increase in the GDP per capita, there is a decrease in the investment in R&D.

Besides the overall IPR measure, the first-comer results show uniformly significant negative results of IPR on investment in R&D, indicating that the positive result for the ten-year lag might indeed be unreliable due to the reduced number of observations. The remaining significant results for the IPR indexes are illustrated in *Table 70* on the next page. The table shows that the TRIPS-plus provisions in PTAs have no significant effect on the investment in R&D and that the general provisions have a reoccurring negative effect over time. However, the most distinct negative effect has the index IPR specific after the time of entry into force of the PTAs (*-0.026*), which means that the investment in R&D is decreased by including more general and especially more specific IPR provisions in PTAs. Similar to the models covering the overall IPR measure, the control variables in the FC models have a more pronounced significant effect on the investment in R&D. The most consistent positive effect can be observed for the classic IP leader, respectively the negative one for the GDP per capita (log). The significant effects cover all time deltas except the ten-year lag.

These results would suggest that the effect of IPR on investment in R&D is most likely observable if the PTA is the first one to include the IPR commitments (FC models) and contrary to the anticipated positive effect, these more novel IPR provisions lead to a decrease of investment in R&D over time.

The general binary variables also show some significantly positive and negative effects. For example, for the overall IPR measurement *ipr_mfn* and *ipr_m_new_plant_varieties* have a significantly positive effect on investment in R&D, whilst others have a significantly negative effect such as *ipr_border_measures* and *ipr_m_copyrights_related_rights*. This suggests that if certain general IPR variables are included in PTAs, whether novel or repetitively, then these variables increase resp. decrease investment in R&D. However, the results are, for the most part, only visible for a single time dimension and do not constitute generalisable patterns for particular variables. This predicament also extends to the FC models as well as the specific binary variables.

Table 70: Economic Effects Regression – Investment in R&D, IPR Indexes II

	First-comer IPR			
	df	*df*	*df3l*	*df5l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	-0.014* (0.007)	—	-0.024. (0.013)	-0.015* (0.007)
Index IPR specific (sum)	—	-0.026* (0.01)	—	—
Index IPR TRIPS-plus (sum)	—	—	—	—
Control Variables				
Democratisation (Polity 2)	-0.006. (0.003)	-0.006. (0.003)	-0.02** (0.006)	0.006. (0.003)
Classic IP leaders	0.15*** (0.04)	0.173*** (0.041)	0.09 (0.078)	0.197*** (0.044)
Countries with a high increase of patent protection	-0.008 (0.039)	-0.002 (0.039)	-0.042 (0.068)	0.017 (0.035)
New IP producers and developers	0.038 (0.038)	0.052 (0.038)	0.131. (0.069)	0.172*** (0.042)
ln GDP	-0.01 (0.009)	-0.012 (0.009)	0.008 (0.017)	0.005 (0.009)
ln GDPpc	-0.039* (0.017)	-0.041* (0.017)	-0.026 (0.034)	-0.081*** (0.018)
ln Geographic distance (mean)	0.015 (0.017)	0.017 (0.017)	0.005 (0.033)	0.026 (0.018)
Intercept	0.538* (0.215)	0.563** (0.215)	0.225 (0.415)	0.43. (0.224)
Model	m1_fc_df_gi	m1_fc_df_si	m1_fc_df3l_gi	m1_fc_df5l_gi
Observations	923	923	764	684

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The TRIPS-plus additive variables show more consistently significant effects. For instance, *ipr_tripsplus_geo_indications* have a significantly positive and *ipr_tripsplus_new_plant_varieties* a significantly negative effect on the investment in R&D, for both overall and FC IPR measures. This means that countries including IPR commitments on GIs going beyond TRIPS have an increased investment in R&D, whilst the effect is negative for TRIPS-plus provisions on new plant varieties.

Finally, looking at the results for the separate development levels of countries, the regression analysis shows that the FC models include significantly negative results across development levels except for low-income countries (LIC). For the LIC models, the index IPR specific has a significantly positive effect on the investment in R&D after a ten-year lag (*2.112*). However, the number of observations is again substantially lower than for the other models, meaning that these results could change with broader data coverage for the dependent variable. The overall IPR measure shows mostly significantly positive results for high-income countries (HIC), lower-middle-income countries (LMIC) and LIC across various time deltas. These results suggest that for those PTAs repeating IPR provisions already included in a countries' previous PTA, there is a significantly positive effect on investment in R&D and a negative effect if the IPR provisions are novel (FC). For upper-middle-income countries (UMIC), there are only significantly negative effects for the FC models.

5.2.3.2 FDI/ Licensing Economic Effect Analysis

For **FDI**, there are no significant results of the IPR indexes across all models and time dimensions. This is the case for both the overall as well as the FC IPR measurement. Furthermore, neither the general and specific binary variables nor the TRIPS-plus additive variables show significant results of any of the IPR variables on FDI across all tested models. For illustrative purposes, the following *Table 71* displays the results for the IPR indexes at *df*. The regression table shows that the level of democratisation has a consistently significant negative effect on FDI. This means that with an increased level of democratisation, there is a decrease of investment in R&D for the time between PTA signature and the entry into force of the PTA. This effect remains valid for the majority of the tested models and thus also for other time dimensions.

There is only one observable significant effect of IPRs on FDI, which is found in one of the HIC models. Hereby, the regression analysis shows that the index IPR general of the overall IPR measure has a positive effect on FDI (*1.325*) for the time after the transition period has ended (*dft*). This means that an increase in general IPR variables has a positive effect on FDI in high-income countries, even if the general IPR provisions repeat previous commitments. This effect is not driven by any IPR variable in particular as the general binary variables of the HIC models show no distinct positive effects, rather significantly negative effects (*ipr_m_new_plant_varieties*: *-32.076*; *ipr_m_encrypted_program_carrying_satellite_signals*: *-39.52*). HIC countries are thus more likely to receive an increase in FDI after the transition period for IPRs has ended if the increase general IPR provisions in their PTAs. The positive direction is along the line of the postulated hypothesis.

Table 71: Economic Effects Regression – FDI

	Overall IPR		
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	0.032 (0.504)	—	—
Index IPR specific (sum)	—	0.064 (0.876)	—
Index IPR TRIPS-plus (sum)	—	—	0.025 (0.329)
Control Variables			
Democratisation (Polity 2)	-1.678** (0.621)	-1.675** (0.62)	-1.675** (0.62)
Classic IP leaders	6.156 (7.915)	6.117 (7.977)	6.096 (8.026)
Countries with a high increase of patent protection	7.403 (7.03)	7.374 (6.972)	7.357 (6.958)
New IP producers and developers	-12.256 (8.476)	-12.259 (8.476)	-12.244 (8.47)
ln GDP	-1.324 (2.03)	-1.323 (2.03)	-1.315 (2.033)
ln GDPpc	0.5 (3.359)	0.504 (3.331)	0.501 (3.337)
ln Geographic distance (mean)	-1.043 (3.852)	-1.065 (3.896)	-1.048 (3.843)
Intercept	50.829 (49.067)	51.038 (49.392)	50.766 (48.691)
Model	m2.1_df_gi	m2.1_df_sgi	m2.1_df_ti
Observations	2594	2594	2594

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

For **licensing**, the situation is different than for FDI, and the regression analysis shows significant results. *Table 72* summarises the significant effects of the IPR indexes on licensing and illustrates that the observable effects are only seen for the index IPR general. For the overall IPR measure, the effect is significantly negative for the three-year lag (*-0.57*) and significantly positive after the transition period has ended, yet on a much lower level (*0.057*). For novel IPR commitments shown in the FC model, the effect is most pronounced and significantly positive after the five-year lag (*1.978*).

The general binary variables for the FC models show ambiguous results. Whilst some general variables have a significantly positive effect in some models, their effect is significantly negative for the model in other time dimensions. The only general FC IPR variable with a consistently positive effect on licensing is *ipr_investment_nt* resp. with a consistently negative effect are *ipr_as_investment* and *ipr_assistance_coop_coordination*. For example, this implies that where IPR is defined as investment there is a negative effect on licensing, which is counterbalanced if the investment provisions also grant national treatment. The FC measure shows no further significant results for both the binary specific variables and the TRIPS-plus additive variables.

Table 72: Economic Effects Regression – Licensing

	Overall IPR		FC IPR
	df3l	*dft*	*df5l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	-0.57* (0.281)	0.057. (0.032)	1.978. (1.025)
Index IPR specific (sum)	—	—	—
Index IPR TRIPS-plus (sum)	—	—	—
Control Variables			
Democratisation (Polity 2)	1.017* (0.494)	-0.104. (0.055)	0.431 (0.701)
Classic IP leaders	-6.204 (4.567)	-0.455 (0.528)	-12.732. (6.641)
Countries with a high increase of patent protection	18.892*** (4.409)	-0.086 (0.513)	21.885*** (6.069)
New IP producers and developers	-0.497 (4.462)	-0.225 (0.518)	-4.287 (6.272)
ln GDP	-4.929*** (1.206)	-0.316* (0.14)	-5.426** (1.725)
ln GDPpc	6.433** (2.107)	0.076 (0.246)	8.938** (2.937)
ln Geographic distance (mean)	3.651 (2.269)	-0.219 (0.26)	1.163 (3.226)
Intercept	44.453 (28.986)	11.114*** (3.3)	59.03 (41.194)
Model	m2.2_df3l_gi	m2.2_dft_gi	m2.2_fc_df5l_gi
Observations	1326	1356	1224

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The overall IPR measure shows for the general binary variables consistently significant positive results of *ipr_mentioned* and negative ones for *ipr_1_article* and *ipr_m_layout_design_integ_circuits*. This implies that if countries repeatedly mention IPRs, licensing increases, whilst including only one IPR article resp. generally mentioning the layout-design of integrated circuits decreases licensing. Out of the specific binary variables of the overall measure, *ipr_t_industrial_designs* has a significantly reoccurring positive effect on licensing, whilst *ipr_t_new_plant_varieties* shows a negative one. Thus, countries repeating tangible industrial design measures in their PTAs have an increase in licensing whilst those including tangible provisions on new plant varieties experience a decrease. For the TRIPS-plus additive variables, there is one reoccurring significant negative effect, namely for *ipr_tripsplus_enforcement*. This means that TRIPS-plus provisions have no positive effect on licensing and by including TRIPS-plus provisions on enforcement, a countries' licensing decreases.

Looking at the countries according to their development level, the HIC models show multiple significant results, whereby all results show a negative effect of the IPR indexes on licensing. This means that the effect of IPRs on licensing in HIC are contrary to the anticipated positive effect. For the UMIC models, there is only one significant result, namely for the five-year lag of the FC measure of the index IPR general (*9.691*). Thus, unlike for the HIC models, here, more general IPR increases licensing along the line of the argument of the hypothesis. For the LMIC models, there IPR indexes show no significant results on licensing. Lastly, for the LIC models, there are two significant results for the index IPR specific for the three-year lag for both the overall (*5.687*) and FC measure (*5.687*). This means that specific IPR provisions have a positive effect on licensing in low-income countries.

In summary, the IPR indexes have no generalisable effects on FDI but significantly positive as well as negative effects on licensing. The analysis according to the development level of countries shows significant diverging results.

5.2.3.3 Innovation Economic Effect Analysis

The results for the innovation factors differ substantially. Whereas researchers in R&D are significantly affected by the IPR indexes, the residential applications for trademarks, industrial designs and patents are only selectively impacted.

Firstly, all IPR indexes have a significant effect on **researchers in R&D**. *Table 73* displays the significant results of the overall IPR measure for *df*, and *Table 74* for *df3l*. *Table 75* illustrates the significant effects of the FC IPR measure. All three tables show that the index IPR general, specific and TRIPS-plus have a significantly negative effect on the development of the number of researchers in R&D. However, across all displayed models, the control variables show a more pronounced significant effect, namely a consistently positive effect of the classic IP leader and geographical distance as well as a negative effect of GDPpc (log).

Table 73: Economic Effects Regression – Innovation: Researchers in R&D I

	Overall IPR		
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	-0.006*** (0.001)	—	—
Index IPR specific (sum)	—	-0.011*** (0.002)	—
Index IPR TRIPS-plus (sum)	—	—	-0.003*** (0.001)
Control Variables			
Democratisation (Polity 2)	0.003 (0.002)	0.002 (0.002)	0.002 (0.002)
Classic IP leaders	0.049* (0.022)	0.075*** (0.022)	0.063** (0.022)
Countries with a high increase of patent protection	-0.035 (0.021)	-0.024 (0.021)	-0.017 (0.021)
New IP producers and developers	0.04* (0.02)	0.051* (0.02)	0.042* (0.02)
ln GDP	-0.001 (0.005)	-0.002 (0.005)	-0.003 (0.005)
ln GDPpc	-0.021* (0.01)	-0.023* (0.01)	-0.021* (0.01)
ln Geographic distance (mean)	0.028** (0.009)	0.042*** (0.01)	0.032** (0.01)
Intercept	0.103 (0.116)	-0.006 (0.116)	0.065 (0.117)
Model	m3.1_df_gi	m3.1_df_si	m3.1_df_ti
Observations	786	786	786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Table 74: Economic Effects Regression – Innovation: Researchers in R&D II

	Overall IPR		
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	-0.007** (0.002)	—	—
Index IPR specific (sum)	—	-0.016*** (0.004)	—
Index IPR TRIPS-plus (sum)	—	—	-0.006*** (0.002)
Control Variables			
Democratisation (Polity 2)	0.001 (0.004)	0.001 (0.004)	0.001 (0.004)
Classic IP leaders	0.113** (0.043)	0.135** (0.044)	0.131** (0.044)
Countries with a high increase of patent protection	-0.02 (0.04)	-0.011 (0.039)	-0.006 (0.039)
New IP producers and developers	0.064 (0.039)	0.093* (0.04)	0.091* (0.04)
ln GDP	-0.004 (0.009)	-0.004 (0.009)	-0.004 (0.009)
ln GDPpc	-0.086*** (0.02)	-0.089*** (0.02)	-0.089*** (0.02)
ln Geographic distance (mean)	0.054** (0.018)	0.073*** (0.02)	0.067*** (0.019)
Intercept	0.757** (0.237)	0.559* (0.24)	0.598* (0.239)
Model	m3.1_df3l_gi	m3.1_df3l_si	m3.1_df3l_si
Observations	640	640	640

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Table 75 illustrates that the effect of the IPR indexes is more pronounced after the three-year lag. However, the number of observations has also substantially dropped (*N=640*), which means that the results are less generalisable. Table 75 summarises the significant results for the FC IPR measure, which display almost identical effects for the IPR indexes as seen in the overall IPR analysis. The results imply that an increase in general, specific and TRIPS-plus provisions in PTAs has a significantly negative effect on the number of researchers in a country after the PTA has entered into force and even more so three years after the entry into force. This intermediate negative effect is not counterbalanced by a later positive effect, which means that there is no positive effect of IPR on this measure of innovation.

Table 75: Economic Effects Regression – Innovation: Researchers in R&D III

	First-comer IPR				
	df	*df*	*df3l*	*df3l*	*df3l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	—	—	-0.018. (0.009)	—	—
Index IPR specific (sum)	-0.018** (0.006)	—	—	-0.035** (0.011)	—
Index IPR TRIPS-plus (sum)	—	-0.008*** (0.002)	—	—	-0.011*** (0.003)
Control Variables					
Democratisation (Polity 2)	0.001 (0.002)	0.001 (0.002)	-0.002 (0.004)	-0.001 (0.004)	-0.001 (0.004)
Classic IP leaders	0.056* (0.023)	0.066** (0.022)	0.108* (0.043)	0.135** (0.045)	0.129** (0.044)
Countries with a high increase of patent protection	-0.011 (0.021)	-0.014 (0.021)	0 (0.039)	0.001 (0.039)	0 (0.039)
New IP producers and developers	0.043* (0.02)	0.038. (0.02)	0.053 (0.039)	0.076. (0.039)	0.059 (0.038)
ln GDP	-0.002 (0.005)	-0.005 (0.005)	-0.006 (0.009)	-0.009 (0.009)	-0.009 (0.009)
ln GDPpc	-0.027** (0.01)	-0.025* (0.01)	-0.089*** (0.02)	-0.091*** (0.02)	-0.085*** (0.02)
ln Geographic distance (mean)	0.023* (0.009)	0.032*** (0.01)	0.055** (0.019)	0.06** (0.019)	0.065*** (0.019)
Intercept	0.178 (0.12)	0.158 (0.117)	0.778** (0.239)	0.809*** (0.238)	0.733** (0.236)
Model	m3.1_fc_df_si	m3.1_fc_df_ti	m3.1_fc_df3l_gi	m3.1_fc_df3l_si	m3.1_fc_df3l_ti
Observations	786	786	640	640	640

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The general binary variables show a less consistent picture. For the overall IPR measure, only the variable *ipr_implementation* shows a reoccurring positive effect on the number of researchers in R&D. Unlike the FC IPR measure, which shows repeating significant negative results for *ipr_implementation*, as well as *ipr_mentioned* and *ipr_m_industrial_designs*. Moreover, the FC models also include reoccurring significant positive effects for *ipr_1_article*, *ipr_m_geo_indications*, *ipr_m_layout_design_integ_circuits*, and *ipr_m_domain_names*. For instance, this means that if countries include a general provisions on IPR implementation for the first time in a PTA, there is a negative effect on the number of researchers. This effect is inverted if countries repeat the implementation provisions (overall IPR measure). The specific binary variables show for the overall IPR measures a negative impact of *ipr_civil_administrative_procedures_remedies* and *ipr_t* *_geo_indications*, whereas the FC measure shows a positive effect of *ipr_t_patents* and a negative one for *ipr_t_industrial_designs*. For example, this means that countries including specific commitments on patents for the first time in a PTA, there is a positive effect on the number of researchers in R&D, whereas the effect is inverted for industrial design. Further, for the repetitive use of specific provisions on GIs, there is also a negative effect observable.

The TRIPS-plus additive variables of the overall IPR measurement show a reoccurring positive effect of *ipr_tripsplus_trademarks* and a negative one for *ipr_tripsplus _new_plant_varieties* as well as *ipr_tripsplus_trad_knowledge_genetic_resources*. The FC IPR measure also indicates a positive effect of *ipr_tripsplus_trademarks* and a negative effect of *ipr_tripsplus_trad_knowledge_genetic_resources*, as well as *ipr_tripsplus _enforcement* and *ipr_tripsplus_exhaustion*. This indicates that, for example, PTAs mentioning or repeating TRIPS-plus provisions on trademarks positively affect the number of researchers in R&D, whereas firstly mentioned TRIPS-plus provisions on enforcement or exhaustion have a negative effect.

Further, the analysis for the subgroups of the development levels shows multiple significant results for the IPR indexes. The HIC data shows multiple significant results for all indexes with predominately negative results, and only two positive results for the general index in the *df10l* and *dft* model (*0.008* resp. *0.004*). The *df10l* model has a limited number of observations, and the results are not representative for the HIC data. The UMIC subgroup displays multiple significant results for all indexes also with predominately negative results as well as three positive results for the TRIPS-plus index in the overall *df5l* and *df10l* and FC *df10l* model (*0.017*, *0.046* resp. *0.14*). Here, the two latter results also are found in the models with the fewest observations due to the ten-year lag, and the results are not generalisable for the UMIC data. For the LMIC data, there is only one significant result for the general index (-*0.015*), which is significantly negative. There are no significant results for the LIC data. Thus, the majority of results for the HIC, UMIC and LMIC data primarily reflects the negative effects also found in the general analysis.

Secondly, I analyse the **resident applications for trademarks** as a measure for innovation. However, the regression tables for the resident applications show no significant results for the IPR indexes on the number of researchers in R&D. This concerns the overall and FC IPR measures as well as the general and specific binary variables and the additive categories. *Table 76* illustrates the regression for *df* and shows that the indexes all have a negative effect on the number of researchers, yet to no significant extent. The only significant effect is shown by the level of democratisation, which has a significantly negative effect on the number of researchers in R&D.

Table 76: Economic Effects Regression – Innovation: Resident Applications for Trademarks

	Overall IPR		
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	-0.089 (0.08)	—	—
Index IPR specific (sum)	—	-0.042 (0.131)	—
Index IPR TRIPS-plus (sum)	—	—	-0.01 (0.049)
Control Variables			
Democratisation (Polity 2)	-0.284** (0.104)	-0.294** (0.104)	-0.294** (0.104)
Classic IP leaders	-0.176 (1.308)	-0.4 (1.309)	-0.427 (1.317)
Countries with a high increase of patent protection	-1.672 (1.106)	-1.474 (1.091)	-1.455 (1.089)
New IP producers and developers	0.517 (1.318)	0.451 (1.317)	0.437 (1.316)
ln GDP	0.164 (0.316)	0.154 (0.316)	0.15 (0.316)
ln GDPpc	-0.246 (0.525)	-0.285 (0.524)	-0.289 (0.525)
ln Geographic distance (mean)	-0.316 (0.612)	-0.377 (0.622)	-0.403 (0.614)
Intercept	4.475 (7.518)	5.114 (7.614)	5.414 (7.52)
Model	m3.2_df_gi	m3.2_df_si	m3.2_df_ti
Observations	2278	2278	2278

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The separation of the data according to the development level of countries shows multiple significant results across all IPR indexes for HIC. Most effects are negative, with the only two positive effects observable for the overall general IPR *dft* and FC specific index *dft*. For UMIC, the analysis shows only one significantly positive result for the general index *dft* (*0.016*), and for LMIC and LIC, there are no significant results. This means that LMIC and LIC are in line with the general analysis, which observes no effect. For UMIC, there is a slight positive effect on the number of resident applications for trademarks for countries including general provisions, whereas HIC are negatively affected.

Thirdly, I look at the **resident applications for industrial designs** and find multiple significant effects for the overall IPR measure and none for the FC measure. *Table 77* and *Table 78* display all significant effects found for the IPR indexes.

Table 77: Economic Effects Regression – Innovation: Resident Applications for Industrial Designs I

	Overall IPR		
	df	*df*	*df*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	-0.16*** (0.044)	—	—
Index IPR specific (sum)	—	-0.172* (0.07)	—
Index IPR TRIPS-plus (sum)	—	—	-0.062* (0.026)
Control Variables			
Democratisation (Polity 2)	-0.035 (0.063)	-0.051 (0.063)	-0.051 (0.063)
Classic IP leaders	0.823 (0.741)	0.722 (0.749)	0.748 (0.753)
Countries with a high increase of patent protection	-1.052. (0.635)	-0.735 (0.626)	-0.676 (0.624)
New IP producers and developers	0.717 (0.734)	0.669 (0.735)	0.621 (0.735)
ln GDP	0.098 (0.179)	0.092 (0.18)	0.075 (0.18)
ln GDPpc	0.148 (0.308)	0.085 (0.308)	0.088 (0.308)
ln Geographic distance (mean)	-0.399 (0.353)	-0.408 (0.36)	-0.474 (0.354)
Intercept	1.632 (4.294)	1.65 (4.347)	2.479 (4.296)
Model	m3.3_df_gi	m3.3_df_si	m3.3_df_ti
Observations	1998	1998	1998

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Table 77 shows that the general and specific IPR indexes have a more pronounced impact on the resident applications for industrial designs than the TRIPS-plus index. The results indicate that with an increase of general and specific provisions, the number of residential applications for industrial design decreases significantly. At least for the time between the date of signature of the PTA and its entry into force (*df)*. However, the IPR indexes are not the only variables with significant results. Unlike for the previously analysed factors, here, the countries with a high increase of patent protection have the most pronounced significant result, at least in the model including the general IPR index. If a country signs a PTA with Brazil, China, India or Mexico, then this negatively affects the resident applications for industrial design. However, if the PTA includes IPR specific or TRIPS-plus provisions then the effect loses its significance.

Table 78 shows that for the three-year lag (*df3l*), the negative effect of the three IPR indexes intensifies. Moreover, the countries with a high increase of patent protection have no more significant effect, whilst democratisation shows a reoccurring negative and classic IPR leaders a consistently positive effect. This means that a higher score on the democratisation index intermediately decreases the residential applications for industrial design, whereas PTAs with the classic IP leaders substantial increase them.

Table 78: Economic Effects Regression – Innovation: Resident Applications for Industrial Designs II

	Overall IPR		
	df3l	*df3l*	*df3l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	-0.304** (0.092)	—	—
Index IPR specific (sum)	—	-0.421** (0.154)	—
Index IPR TRIPS-plus (sum)	—	—	-0.159** (0.061)
Control Variables			
Democratisation (Polity 2)	-0.297* (0.126)	-0.33** (0.125)	-0.334** (0.125)
Classic IP leaders	3.146* (1.514)	3.032* (1.521)	2.993* (1.521)
Countries with a high increase of patent protection	-0.848 (1.251)	-0.377 (1.234)	-0.275 (1.231)
New IP producers and developers	1.679 (1.451)	1.664 (1.453)	1.583 (1.452)
ln GDP	-0.155 (0.366)	-0.153 (0.366)	-0.181 (0.366)
ln GDPpc	0.765 (0.621)	0.686 (0.62)	0.689 (0.62)
ln Geographic distance (mean)	-1.021 (0.708)	-0.863 (0.728)	-0.963 (0.721)
Intercept	11.351 (8.758)	9.582 (8.894)	10.887 (8.821)
Model	m3.3_df3l_gi	m3.3_df3l_si	m3.3_df3l_ti
Observations	1797	1797	1797

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Looking at the effect of the IPR design in more detail highlights that the specific binary IPR variables have no significant effect on the resident applications for industrial designs, both for the overall and FC IPR measurement. Out of the overall binary general variables, only the variable *ipr_1_article* has a negative effect and *ipr_assistance_coop_coordination* a positive one. The FC binary general variables only have a significant negative effect for the variable *ipr_nt (-0.577*) for *dft*. The overall TRIPS-plus additive variables also show only significant effects for *dft*, whereby *ipr_tripsplus_geo_indications* has a significantly negative effect (*-0.767*), and *ipr_tripsplus_exhaustion* has a significantly positive effect (*6.975*). The effect of exhaustion remains significant for the FC IPR measure (*6.495*). For instance, this means that countries agreeing to TRIPS-plus exhaustion measures in PTAs experience a rise in residential applications for industrial designs after the transition period for IPRs has ended. However, the majority of the IPR variables are negatively related to the dependent variable and are mirroring the effects observable for the IPR indexes.

The analysis for the subgroups of countries' development levels shows multiple significant results for HIC. All of them are negative except for the positive effect of the FC index IPR specific for *dft*, which additionally represents the most pronounced estimate (*0.815*). The results for the UMIC data is similar to the HIC data with multiple significant negative results for the general IPR index of both overall and FC IPR measure. The LMIC data differs as it shows two significant positive results for the FC general IPR index of *df3l* and *df5l*. The LIC analysis displays no significant results for the IPR indexes. The results suggest that the design of IPRs in PTAs has no effect on resident applications for industrial designs in LIC, whereas an increase in general IPR commitments has a positive effect of residential applications in LMIC. The negative relation between IPR design and resident applications is mirrored by the HIC and UMIC data.

Fourthly, I analyse the **resident applications for patents** as a measure for innovation. *Table 79* on the next page displays the only two significant results of the IPR indexes found for the five-year and ten-year lag of the overall IPR measure. Both results show a significant negative effect for the index IPR general, whereby in both models, democratisation shows an even more pronounced negative effect on the resident applications for patents. Moreover, the *df10l* model includes a significantly negative effect of countries with a high increase of patent protection and GDP (log) as well as a significantly positive one for GDPpc (log). As the number of observations is comparably high for *df10l*, this indicates that after ten years of the entry into force of the PTA, the resident applications are negatively affected not only by the general IPR provisions in a PTA but also, for example, by the level of democratisation.

Table 79: Economic Effects Regression – Innovation: Resident Applications for Patents

	Overall IPR	
	df5l	*df10l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	-0.056. (0.031)	-0.152* (0.07)
Index IPR specific (sum)	—	—
Index IPR TRIPS-plus (sum)	—	—
Control Variables		
Democratisation (Polity 2)	-0.188*** (0.038)	-0.753*** (0.084)
Classic IP leaders	0.111 (0.484)	-0.474 (1.075)
Countries with a high increase of patent protection	-0.511 (0.389)	-1.757. (0.898)
New IP producers and developers	-0.163 (0.466)	1.361 (1.285)
ln GDP	-0.129 (0.119)	-0.718** (0.261)
ln GDPpc	0.165 (0.196)	1.89*** (0.436)
ln Geographic distance (mean)	-0.297 (0.227)	-0.425 (0.502)
Intercept	7.509** (2.814)	15.64* (6.404)
Model	m3.4_df5l_gi	m3.4_df10l_gi
Observations	1901	1558

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The detailed IPR variables analysis finds no significant results for all FC regressions as well as none for the overall binary specific and additive TRIPS-plus variables. Only one of the overall binary general models shows significant effects. Again, these results are found in the *df10l* model, which shows a significant negative effect for *ipr_as_investment* (*-14.297*) and a positive one for *ipr_assistance_coop_coordination* (*3.501*). This suggests that those countries with PTAs defining IPR as investment have a substantially lower number of residential applications for patents, whereas a general commitment to IPR assistance, cooperation and coordination positively affects them.

The analysis of the development subgroups mostly reflects the negative results found for the analysis of the general data. The HIC have multiple significant results across indexes predominately negative expect from significantly positive results for the overall general index for *dft* and all three FC IPR indexes for *dft*. The UMIC only has three significant results, whereby one is significantly positive for the overall general IPR index for *dft*, and the other two are significantly negative for the specific and TRIPS-plus indexes for *df*. For LMIC, there are two significant negative results for the overall general IPR index for *df5l* and *df10l.* The LIC have one significant result for the FC general IPR index (*0.052*) and are otherwise not visibly impacted by the design of IPRs in PTAs. Except for the LIC, the majority of effects for the development level of countries is negative and as suggested by the comprehensive analysis shows a decrease of residential applications for patents with an increase of IPRs in PTAs. Unlike in the original dataset, the analysis by development level also shows significant negative effects for the specific and TRIPS-plus indexes.

In summary, the analysis of the four measures for innovation shows consistent negative effects of the general, specific and TRIPS-plus indexes.

5.2.3.4 Technology Transfer Economic Effect Analysis

The regression analysis for technology covers twelve factors, namely, the total applications for industrial designs, total applications for patents, PTA member applications for industrial designs, PTA member applications for patents, total *htp* imports, total *mhtp* imports, total *mltp* imports, total *ltp* imports, PTA member *htp* imports, PTA member *mhtp* imports, PTA member *mltp* imports and PTA member *ltp* imports. Where the results show a positive relationship between the design of IPRs in PTAs and technology transfer, the effects are predominantly positive or at least positive as well as negative.

Firstly, the **total applications for industrial designs** are not significantly affected by the design of IPRs, neither for the overall nor the FC IPR measurement. *Table 80* on the following page displays the regression results of the general, specific and TRIPS-plus index for the overall IPR measure for *df*. The table shows that the only significant effect is observable for the control variable measuring the geographical distance, which shows for the models including the specific resp. TRIPS-plus index a significantly negative effect on the number of total applications for industrial designs. This means that with an increased distance between PTA members, there are fewer total applications for industrial designs.

Table 80: Economic Effects Regression – Technology Transfer: Total Applications for Industrial Designs (cumulative)

	Overall IPR		
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	-0.03 (0.032)	—	—
Index IPR specific (sum)	—	0.001 (0.052)	—
Index IPR TRIPS-plus (sum)	—	—	0.002 (0.019)
Control Variables			
Democratisation (Polity 2)	0.01 (0.045)	0.008 (0.045)	0.008 (0.045)
Classic IP leaders	-0.28 (0.523)	-0.384 (0.527)	-0.393 (0.531)
Countries with a high increase of patent protection	-0.512 (0.446)	-0.425 (0.438)	-0.424 (0.437)
New IP producers and developers	0.352 (0.522)	0.32 (0.522)	0.32 (0.522)
ln GDP	0.101 (0.133)	0.1 (0.133)	0.101 (0.133)
ln GDPpc	-0.326 (0.235)	-0.355 (0.235)	-0.357 (0.235)
ln Geographic distance (mean)	-0.385 (0.247)	-0.426. (0.251)	-0.428. (0.247)
Intercept	4.142 (3.044)	4.538 (3.077)	4.551 (3.036)
Model	m4.1_df_gi	m4.1_df_si	m4.1_df_ti
Observations	1807	1807	1807

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The in-depth analysis of the general and specific binary IPR variables as well as the TRIPS-plus additive categories also finds no significant effect for IPR on the total applications for industrial designs, neither for the overall nor the FC IPR measure.

The development level subgroups show some significant links, yet only for the HIC and UMIC data. For both of these subgroups, the analysis reveals multiple significant positive and negative results for the overall and FC IPR measure across all indexes. The LMIC and LIC data displays no significant effects. This suggests that HIC and UMIC countries total applications for industrial deigsn can be both positively as well as negatively affected by the design of IPRs in PTAs, whereas the those countries with a lower income level are not affected by it.

Secondly, I look at the **total applications for patents**, which also display no significant results for the IPR design for both the overall as well as the FC IPR measures. Therefore, *Table 81* illustrates the regression analysis for the general, specific and TRIPS-plus index for the overall IPR measure for *df*. Similar to the analysis of the total applications for industrial designs, the table only shows significant effects for the geographical distance. Hereby, the effect is significantly negative across all IPR indexes. There are also no observable effects when looking at the general and specific binary variables nor the TRIPS-plus additive variable, neither for the overall nor FC IPR measure.

Table 81: Economic Effects Regression – Technology Transfer: Total Applications for Patents (cumulative)

	Overall IPR		
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	-0.019 (0.022)	—	—
Index IPR specific (sum)	—	0.005 (0.036)	—
Index IPR TRIPS-plus (sum)	—	—	0.002 (0.013)
Control Variables			
Democratisation (Polity 2)	0.006 (0.031)	0.004 (0.031)	0.004 (0.031)
Classic IP leaders	-0.378 (0.362)	-0.45 (0.363)	-0.455 (0.365)
Countries with a high increase of patent protection	-0.184 (0.303)	-0.131 (0.299)	-0.131 (0.298)
New IP producers and developers	0.003 (0.371)	-0.02 (0.371)	-0.019 (0.37)
ln GDP	0.098 (0.087)	0.095 (0.087)	0.096 (0.087)
ln GDPpc	-0.138 (0.152)	-0.152 (0.152)	-0.153 (0.152)
ln Geographic distance (mean)	-0.287. (0.167)	-0.315. (0.171)	-0.315. (0.168)
Intercept	1.528 (2.062)	1.83 (2.087)	1.825 (2.061)
Model	m4.2_df_gi	m4.2_df_si	m4.2_df_ti
Observations	2194	2194	2194

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

However, all of the subgroups of income levels show significant results. The HIC data has multiple significant positive and negative results across all indexes for both the overall and FC IPR measure. The UMIC data also includes multiple significant effects, which are predominately positive except for a negative effect for FC index IPR general for *df10l* (*-0.053*). The LMIC data has one significant effect for the overall general index for *df10l* (*-0.435*), and the LIC data three significant effects for the overall general index for *df*, *df3l* and *df5l*. The effects of IPR design on the total applications for patents are thus mixed for the HIC, mostly positive for UMIC and negative for both the LMIC and LIC. Hence, the development level of countries clearly affects the direction of the effect of IPRs in PTAs for this measure.

Thirdly, I look at the **PTA member applications for industrial designs**, and unlike for the total applications, the regression analysis finds significant effects. *Table 82* displays the significant overall IPR effects and *Table 83* the significant FC IPR effects.

Table 82: Economic Effects Regression – Technology Transfer: PTA Member Applications for Industrial Designs (cumulative) I

	Overall IPR			
	df5l	*df5l*	*df10l*	*df10l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	—	—	—	—
Index IPR specific (sum)	0.206. (0.114)	—	0.476** (0.178)	—
Index IPR TRIPS-plus (sum)	—	0.086. (0.05)	—	0.301** (0.097)
Control Variables				
Democratisation (Polity 2)	0.023 (0.13)	0.02 (0.13)	-0.14 (0.175)	-0.138 (0.175)
Classic IP leaders	-0.58 (1.351)	-0.545 (1.35)	-6.274*** (1.883)	-6.237*** (1.871)
Countries with a high increase of patent protection	-1.667 (1.272)	-1.739 (1.268)	-1.837 (1.516)	-1.788 (1.509)
New IP producers and developers	0.199 (1.182)	0.136 (1.2)	-1.416 (1.803)	-1.303 (1.798)
ln GDP	0.701* (0.281)	0.702* (0.281)	0.738* (0.371)	0.68. (0.371)
ln GDPpc	-1.018. (0.544)	-1.002. (0.545)	0.312 (0.722)	0.409 (0.722)
ln Geographic distance (mean)	2.144** (0.704)	2.209** (0.696)	4.288*** (0.942)	4.125*** (0.944)
Intercept	-23.447** (8.052)	-23.985** (8.004)	-47.341*** (11.438)	-45.539*** (11.456)
Model	m4.3_df5l_si	m4.3_df5l_ti	m4.3_df10l_si	m4.3_df10l_ti
Observations	506	506	361	361

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Table 82 shows that the overall specific IPR and TRIPS-plus indexes have a significantly positive effect on the applications for industrial designs by PTA members. However, the effects of the FC IPR measure in *Table 83* show significantly negative results for the general IPR and TRIPS-plus index. This suggests that novel general IPR and TRIPS-plus commitments significantly decrease the PTA member applications for industrial designs, whilst repetitive specific IPR and TRIPS-plus provisions increase them. However, the regression analysis also shows that the other included factors also have a significant and mostly more pronounced effect than the IPR design features. Moreover, the results for the overall IPR and FC general IPR index are hardly generalisable due to the particularly low number of observations (less than 14% of the total observations).

Table 83: Economic Effects Regression – Technology Transfer: PTA Member Applications for Industrial Designs (cumulative) II

	First-comer IPR		
	df	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	—	-0.485. (0.247)	-12.984** (4.866)
Index IPR specific (sum)	—	—	—
Index IPR TRIPS-plus (sum)	-0.066. (0.036)	—	—
Control Variables			
Democratisation (Polity 2)	0.025 (0.058)	-0.233 (0.178)	-5.834*** (1.11)
Classic IP leaders	0.749 (0.587)	-4.59* (1.951)	7.03 (11.191)
Countries with a high increase of patent protection	-0.907 (0.618)	-2.64. (1.515)	13.934 (11.138)
New IP producers and developers	0.044 (0.548)	-1.051 (1.823)	-18.192* (7.943)
ln GDP	0.336** (0.126)	0.942* (0.369)	7.524*** (2)
ln GDPpc	-0.811*** (0.245)	-0.565 (0.788)	-16.179*** (4.873)
ln Geographic distance (mean)	1.355*** (0.29)	5.382*** (0.946)	9.743* (4.499)
Intercept	-11.049*** (3.315)	-52.008*** (11.293)	-55.66 (61.999)
Model	m4.3_fc_df_ti	m4.3_fc_df10l_gi	m4.3_fc_dft_gi
Observations	755	361	430

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The detailed IPR variables analysis finds significant effects for all time dimensions for both the overall and FC IPR measure. The general binary variables have plenty of reoccurring effects, whereby the overall IPR shows mostly effects with a consistent direction. Namely, the analysis finds positive effects for *ipr_nt*, *ipr_border_measures*, *ipr_m_trademarks*, *ipr_m_encrypted_program_carrying_satellite_signals* and negative results for *ipr_mfn*, *ipr_investment_mfn*, *ipr_assistance_coop_coordination*, and *ipr_m _geo_indications*. The FC IPR measure identifies different variables with reoccurring effects, namely positive effects for *ipr_investment_dispute_settlement_mechanism*, *ipr_m _undisclosed_information*, and *ipr_m_domain_names*, as well as negative ones for *ipr _investment_expropriation_exception*, *ipr_m_patents*, *ipr_m_layout_design_integ_circuits*, and *ipr_m_trad_knowledge_genetic_resources*. The IPR measures thus show that there are many general IPR variables that have an effect on PTA members for industrial designs, and that their effects vary according to their novelty in a countries' PTA.

The specific binary variables show a similar picture with multiple reoccurring significant IPR variables, whereby the positive and negative effects vary according to the IPR measurement. For example, the overall IPR measure displays significantly positive effects for *ipr_special_requirements_related_border_measures* and *ipr_t_trademarks*, whereas the FC IPR measure suggests a positive effect of *ipr_t_patents* and *ipr_t_domain_names*. However, the FC IPR measure also shows a significantly negative effect of specific provisions on industrial designs, meaning that if PTAs include specific industrial design provisions for the first time, it has a significantly negative effect on the PTA member applications for industrial designs. Thus, where the IPR provisions most likely require a change of the status quo of the domestic legislation, PTA members are less likely to apply for the protection of industrial design.

The TRIPS-plus additive variables have fewer, yet also a couple of significant reoccurring results. For the overall IPR measure, *ipr_tripsplus_undisclosed_information* and *ipr_tripsplus_layout_design* have a positive resp. *ipr_tripsplus_patents*, *ipr_tripsplus _trad_knowledge_genetic_resources*, and *ipr_tripsplus_exhaustion* a negative effect on PTA members applications for industrial designs. The FC IPR measure shows only one reoccurring effect for the TRIPS-plus variables, namely for PTAs including *ipr_tripsplus_encrypted_program_carrying_satellite_signals*. Certain TRIPS-plus variables thus have a significantly positive or negative effect on the number of applications for industrial designs by PTA members. Albeit the results should be considered and generalised carefully, as the number of observations is low across most models.

Looking at the development level of countries, the regression analysis also shows multiple significant results. For the HIC data, there are multiple significant negative effects across indexes and both IPR measures. Unlike the UMIC data, which shows a significant positive result for the specific IPR index for both overall and FC measure for *df10l*. However, the number of observations might make these results unreliable. The LMIC data has two significant negative effects, one for the overall TRIPS-plus index for *df* (-*0.121*) and one for the FC general index for *df10l* (-*0.353*). The LIC data finds one significant result for the overall index IPR general *df* (*0.509*). The effects thus seem to vary across the level of development, yet are even more prone to bias due to the additional separation resp. reduction of the number of observations.

Fourthly, I also examine the **PTA member applications for patents** and find multiple significant results for the design of IPRs in PTAs again. *Table 84* and *Table 85* on the following pages illustrate all significant results for the overall IPR indexes, and *Table 86* displays all significant effects found for the FC IPR measure.

The overall IPR regressions show a clear positive effect of the general, specific and TRIPS-plus IPR indexes for *df, df3l, df5l* or *df10l*. Only for *dft*, there is a significantly negative effect of the index IPR TRIPS-plus. This indicates that after a certain amount of time has passed between PTA signature and the PTA entering into force, the IPR commitments increase the applications for patents by PTA members. TRIPS-plus commitments have an initial negative effect after the transition period has ended, yet the positive effects for the other deltas suggest that this effect turns positive over time. Besides the effect of the TRIPS-plus index for *df10l*, the effects of the general and specific index are far more distinct than the ones for the TRIPS-plus index. In light of the low number of observations and the lower reliability of the *df10l* results, it is likely that the general and specific IPR commitments in PTAs have a more distinct effect on the PTA member applications for patents than commitments going beyond TRIPS, especially considering the significant negative results for *dft*.

Besides the significant effect of the IPR design, the tables also show that there are other factors in the model with a more pronounced effect. GDP (log) shows a consistently positive effect, surpassed only by the positive results for the geographic distance. This suggests that a higher GDP is in a country and the greater the distance to its PTA partner, the more applications for patents will it receive by its PTA partners.

Table 84: Economic Effects Regression – Technology Transfer: PTA Member Applications for Patents (cumulative) I

	Overall IPR				
	df	*df3l*	*df5l*	*df5l*	*df10l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	—	—	—	2.69*** (0.475)	—
Index IPR specific (sum)	—	—	3.733*** (1.111)	—	2.285*** (0.432)
Index IPR TRIPS-plus (sum)	0.876* (0.42)	0.425* (0.201)	—	—	—
Control Variables					
Democratisation (Polity 2)	0.582 (1.984)	0.095 (0.847)	-0.121 (1.281)	-0.412 (1.264)	0.243 (0.414)
Classic IP leaders	13.35 (19.686)	4.084 (7.97)	-3.531 (12.801)	-8.807 (12.599)	-1.707 (4.158)
Countries with a high increase of patent protection	-24.655 (18.62)	-13.245. (7.52)	-19.207. (11.403)	-16.829 (11.227)	-7.015* (3.561)
New IP producers and developers	-14.481 (16.899)	-4.589 (6.745)	-18.141. (10.672)	-25.267* (10.601)	-6.356 (4.14)
ln GDP	16.708*** (3.812)	7.587*** (1.584)	10.094*** (2.566)	9.481*** (2.532)	1.882* (0.802)
ln GDPpc	-2.485 (7.37)	-0.645 (3.048)	0.466 (4.824)	1.303 (4.76)	-0.265 (1.598)
ln Geographic distance (mean)	34.835*** (8.73)	14.715*** (3.734)	18.634** (6.031)	14.728* (5.869)	7.39*** (1.992)
Intercept	- 687.258*** (108.213)	- 303.791*** (47.373)	- 399.344*** (74.162)	- 356.653*** (72.73)	-99.529*** (25.577)
Model	m4.4_df_ti	m4.4_df3l_ti	m4.4_df5l_si	m4.4_df5l_ti	m4.4_df10l_si
Observations	980	796	721	721	521

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Table 84 shows for some models also a significant negative effect of countries with a high increase of patent protection. This suggests that if Brazil, China, India or Mexico are part of the PTA then countries are less likely to receive more applications by them or other PTA members after the PTA has entered into force than at the time of PTA signature. The other country blocks show no significant effect on the overall IPR measures, same as the other control variables democratisation and GDPpc.

Table 85: Economic Effects Regression – Technology Transfer: PTA Member Applications for Patents (cumulative) II

	Overall IPR	
	df10l	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	—	—
Index IPR specific (sum)	—	—
Index IPR TRIPS-plus (sum)	2.292*** (0.21)	-1.521. (0.848)
Control Variables		
Democratisation (Polity 2)	0.24 (0.383)	2.667 (3.959)
Classic IP leaders	-1.368 (3.842)	36.8 (35.811)
Countries with a high increase of patent protection	-3.932 (3.303)	-18.879 (31.382)
New IP producers and developers	-4.202 (3.836)	46.278. (26.395)
ln GDP	0.835 (0.75)	21.998*** (6.005)
ln GDPpc	-0.083 (1.479)	0.844 (13.326)
ln Geographic distance (mean)	3.295. (1.866)	36.025* (15.253)
Intercept	-45.156. (24.139)	- 898.225*** (198.686)
Model	m4.4_df10l _ti	m4.4_dft_ti
Observations	521	622

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

For the FC effects displayed in *Table 86* on the next page, the results are different compared to the overall IPR measure in both direction and emphasis. The IPR design only shows significant effects for the TRIPS-plus index for *df*, *df3l* and *df5l*, which are all distinctly negative. This suggests that amongst those IPR commitments mentioned for the first time in a countries' PTA, the general and specific ones have no significant effect on PTA member applications for patents, whereas TRIPS-plus provisions have a clear negative effect on them. Thus, when countries first include provisions more stringent than TRIPS, PTA members decrease their applications for patents.

The regression table also shows the same effects as found for the overall IPR measure, namely a significant negative one for countries with a high increase of patent protection and a significant positive one for GDP (log) and the geographic distance.

Table 86: Economic Effects Regression – Technology Transfer: PTA Member Applications for Patents (cumulative) III

	First-comer IPR		
	df	*df3l*	*df5l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	—	—	—
Index IPR specific (sum)	—	—	—
Index IPR TRIPS-plus (sum)	-2.494* (1.205)	-1.179* (0.491)	-1.858* (0.863)
Control Variables			
Democratisation (Polity 2)	0.454 (1.986)	0.058 (0.846)	0.147 (1.284)
Classic IP leaders	30.943 (19.733)	11.196 (7.975)	10.426 (12.804)
Countries with a high increase of patent protection	-29.348 (18.558)	-16.599* (7.47)	-25.218* (11.387)
New IP producers and developers	-11.492 (16.903)	-3.035 (6.72)	-8.806 (10.486)
ln GDP	15.939*** (3.829)	7.341*** (1.588)	10.402*** (2.576)
ln GDPpc	-3.502 (7.395)	-1.031 (3.051)	-0.383 (4.849)
ln Geographic distance (mean)	45.245*** (8.872)	20.21*** (3.649)	30.133*** (5.878)
Intercept	-736.319*** (107.003)	-335.27*** (45.955)	-489.907*** (71.343)
Model	m4.4_fc_df_ti	m4.4_fc_df3l_ti	m4.4_fc_df5l_ti
Observations	980	796	721

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The general binary variables show multiple reoccurring significant positive and negative effects for the overall IPR measure. For instance, there are positive effects for *ipr_m_trademarks* and *ipr_m_patents*, and negative ones for *ipr_m_industrial_designs* and *ipr_m_layout_design_integ_circuits*. This indicates that by mentioning for examples patents in a general manner in PTAs, the number of patent applications by PTA members increases.

The FC IPR measure only shows one significant reoccurring measure, which is negative for *ipr_m_trad_knowledge_genetic_resources*. This suggests that if a country includes general provisions on TK & GR for the first time in a PTA, then it has a negative effect on the applications for patents by PTA members.

The specific binary variables also show multiple reoccurring effects for the overall IPR measure, which are, for example, positive for *ipr_transparency* and *ipr_t_patents*, as well as negative for *ipr_committee* and *ipr_t_industrial_designs*. Thus, not only general but also specific patent provisions in PTAs have a positive effect on the number of patent applications by PTA members. However, other factors such as specific provisions on industrial designs decrease the PTA member applications for patents. Looking at the FC measure, there is again only one significant result, namely for ipr_t_trad_knowledge_genetic_resources for both *df3l* and *df5l*. Specific TK &GR commitments decrease the number of patent applications by PTA members, which repeats the observable effect for general statements on TK & GR.

The TRIPS-plus additive variables show a multiple reoccurring significant effects for the IPR overall measure again, yet no significant impact for the FC IPR measure. For example, the additive variables for *ipr_tripsplus_trademarks* and *ipr_tripsplus_patents* have a significantly positive effect on PTA members applications for patents, whereas *ipr_tripsplus_geo_indications* and *ipr_tripsplus_enforcement* have a significantly negative effect. This suggests that countries, which are repeating TRIPS-plus provisions on patents, can expect an increase in patent applications by PTA members, whereas repetitive TRIPS-plus enforcement provisions have the opposite effect.

The development level analysis shows that multiple significant positive and negative results for both the overall and FC measure across all indexes for the HIC as well as the LIC data. For the UMIC data, there is one significant negative effect for the overall general IPR index for *df10l* (*-0.619*). These results suggest that the countries with the highest resp. lowest income level are affected the most, both positively as well as negatively when it comes to PTA member applications for patents. The UMIC can be affected negatively by general IPR provisions, yet the results need some further testing due to the low data availability of the *df10l* measures.

Fifthly, I look at the **total *htp* imports** as a measure for technology transfer. The regression analysis shows multiple significant effects of the IPR indexes for both the overall and FC IPR measure. However, these effects take place on a very low level, i.e. show neglectable low estimates. The highest impact of an IPR index shows an estimate of

0.000000001017. Thus, the IPR design in PTAs for the total *htp* imports is significant, yet not highly important. *Table 87* illustrates some of the found significant effects for both the overall and the FC IPR measure and shows that the effect of some of the other control variables is also significant, yet on a similarly low level as for the IPR indexes.

Table 87: Economic Effects Regression – Technology Transfer: Total *htp* Imports

	Overall IPR		First-comer IPR		
	df5l	*dft*	*df3l*	*df3l*	*df3l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	—	0. (0)	0* (0)	—	0. (0)
Index IPR specific (sum)	—	—	—	0* (0)	—
Index IPR TRIPS-plus (sum)	0. (0)	—	—	—	—
Control Variables					
Democratisation (Polity 2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Classic IP leaders	0*** (0)	0 (0)	0*** (0)	0*** (0)	0*** (0)
Countries with a high increase of patent protection	0 (0)	0. (0)	0 (0)	0 (0)	0 (0)
New IP producers and developers	0 (0)	0* (0)	0 (0)	0 (0)	0 (0)
ln GDP	0*** (0)	0*** (0)	0*** (0)	0*** (0)	0*** (0)
ln GDPpc	0** (0)	0 (0)	0*** (0)	0*** (0)	0*** (0)
ln Geographic distance (mean)	0** (0)	0 (0)	0** (0)	0*** (0)	0*** (0)
Intercept	-1*** (0)	-1*** (0)	-1*** (0)	-1*** (0)	-1*** (0)
Model	m4.5_df5l_ti	m4.5_dft_gi	m4.5_fc_df3l_gi	m4.5_fc_df3l_si	m4.5_fc_df3l_ti
Observations	311	182	305	305	305

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The regression table also shows that the number of observations is fairly low, making the results of this analysis less generalisable and reliable.

The general and specific binary variables as well as the additive TRIPS-plus variables repeat this pattern and show multiple significant results for both the overall and FC IPR measure. Similar to the IPR indexes, the estimates are very low and only for *df* there are estimates with an effect higher than *0.00000000*. This suggests that the effect of IPR design on the total *htp* imports is highest after the entry into force of a PTA, remains significant but loses its importance afterwards.

The analysis separated according to the development level of countries shows that the HIC, LMIC and LIC mirror the results of the previous analysis and show multiple significant positive results for both the overall and FC IPR measure across indexes, yet on a very low level. The UMIC data has only two significant positive results for the overall TRIPS-plus index for *df10l* and the FC specific index for *df3l*, yet both on a very low level. The effects are thus similar across the development levels, whereby UMIC are a little less affected than the other income-level countries. However, for this dependent variable, the number of observations is particularly low, making the results possible unreliable.

Sixthly, I examine the **total *mhtp* imports** and find no significant results for any of the IPR indexes, neither for the overall nor the FC IPR measure. *Table 88* thus illustrates the effects for the three IPR indexes of the overall IPR measure for *df*.

There are also no significant results for the FC binary regressions nor for the overall binary specific and TRIPS-plus variables. The only significant results found in the more detailed analysis of the IPR variables is the one for the overall general binary variables for *df*, *df3l* and *df5l*. Thereby, there are reoccurring positive effects for the variable *ipr_m_new_plant_varieties*, with the most pronounced effect for *df* (*682.929*). This suggests that general provisions on the protection of new plant varieties in PTAs increases the total number of *mhtp* imports after the entry into force of a PTA, three years later as well as five years later.

Unlike the general analysis, the subgroups of the development levels show multiple significant effects. The HIC data finds one significant positive result for the overall TRIPS-plus index for *df10l*, yet on a very low level. But the UMIC and LMIC data have multiple significant positive results for the overall indexes, although also on a very low level. The LIC data shows predominantly significantly negative effects on a very low level. Thus, even though the income level of countries seems to matter for the effect of IPR design on total *mhtp* imports, the estimates are so low that the importance of IPR is neglectable.

Table 88: Economic Effects Regression – Technology Transfer: Total *mhtp* Imports

	Overall IPR		
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	7.786 (12.179)	—	—
Index IPR specific (sum)	—	-10.149 (24.042)	—
Index IPR TRIPS-plus (sum)	—	—	-3.343 (10.359)
Control Variables			
Democratisation (Polity 2)	9.063 (14.756)	10.451 (14.664)	10.445 (14.673)
Classic IP leaders	-158.152 (217.533)	-64.67 (237.627)	-73.485 (242.189)
Countries with a high increase of patent protection	-33.771 (171.165)	-79.594 (162.783)	-74.521 (161.834)
New IP producers and developers	-52.291 (161.354)	-59.937 (161.364)	-60.885 (161.671)
ln GDP	-1.161 (49.921)	2.756 (50.108)	1.388 (49.912)
ln GDPpc	21.012 (84.194)	29.709 (84.15)	28.868 (84.137)
ln Geographic distance (mean)	-54.622 (87.538)	-47.819 (88.253)	-50.596 (87.743)
Intercept	294.862 (1002.824)	142.542 (1031.284)	198.244 (1012.406)
Model	m4.6_df_gi	m4.6_df_si	m4.6_df_ti
Observations	623	623	623

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Seventhly, I use the **total *mltp* imports** as a measure for technology transfer and find a multitude of significant results for both the overall as well as the FC IPR measure. The effects are displayed in *Table 89* on the following page and shows similar to the total *htp* imports that the effect of IPR design on the total *mltp* imports is significant, but on a very low level. The highest observable effect for an IPR index has an estimate of *0.0000000001809*, which indicates that the effect of IPR in PTAs is benign. The effects of the other variable in the model are comparably insignificant. Additionally, the number of observations is precariously low, making the results unreliable.

The general binary variables show a significant effect for the overall IPR measure of *ipr_assistance_coop_coordination* (*-0.14*), and for the FC IPR measure multiple significant effects, yet on a very low level.

Table 89: Economic Effects Regression – Technology Transfer: Total *mltp* Imports

	Overall IPR			First-comer IPR	
	dft	*dft*	*dft*	*dft*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	0* (0)	—	—	—	—
Index IPR specific (sum)	—	0* (0)	—	0*** (0)	—
Index IPR TRIPS-plus (sum)	—	—	0* (0)	—	0*** (0)
Control Variables					
Democratisation (Polity 2)	0 (0)	0 (0)	0 (0)	0 (0)	0*** (0)
Classic IP leaders	0** (0)	0** (0)	0*** (0)	0** (0)	0 (0)
Countries with a high increase of patent protection	0 (0)	0 (0)	0 (0)	0 (0)	0*** (0)
New IP producers and developers	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
ln GDP	0*** (0)	0*** (0)	0*** (0)	0*** (0)	0 (0)
ln GDPpc	0 (0)	0 (0)	0 (0)	0* (0)	0*** (0)
ln Geographic distance (mean)	0 (0)	0. (0)	0 (0)	0. (0)	0. (0)
Intercept	-1*** (0)	-1*** (0)	-1*** (0)	-1*** (0)	-1*** (0)
Model	m4.7_dft_gi	m4.7_dft_si	m4.7_dft_ti	m4.7_fc_dft_si	m4.7_fc_dft_ti
Observations	279	279	279	279	279

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The specific binary variables also show multiple significant effects for the overall IPR measure on a very low level, whereas for the FC IPR measure, there are only two significant positive effects for *ipr_t_geo_indications* (*0.23*) and *ipr_t_trad_knowledge_genetic_resources* (*0.258*). This suggests concretely that specific provisions on GI and TK & GR increase *mltp* imports.

The TRIPS-plus additive variables show no significant effects for the overall IPR measure and for the FC IPR measure there is only one significant effect for *ipr_tripsplus_trademarks* for the *df* model (*0.121*). This indicates that if countries firstly include TRIPS-plus provisions on trademarks, there is an increase in *mltp* imports.

The number of observations is so low that the analysis of the level of development cannot be considered as being representative for the subgroups. For the sake of completeness, I briefly summarise the findings.

The HIC data shows for the overall and FC TRIPS-plus index a significant positive effect for *df3l*, yet on a very low level. The UMIC data has all positive effects for the overall and FC IPR measures across indexes but also on a very low level. For the LMIC data, the analysis finds no significant effects. Finally, the LIC data shows significant negative effects for the overall and FC IPR measures for the specific and TRIPS-plus index for *df*. Again, these results are based on an insufficient number of observations due to the missing data for the dependent variable.

Eighthly, I analyse the **total *ltp* imports** and find no significant effects of any of the IPR indexes.

Table 90: Economic Effects Regression – Technology Transfer: Total *ltp* Imports

	Overall IPR		
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	299.94 (193.32)	—	—
Index IPR specific (sum)	—	-251.31 (373.5)	—
Index IPR TRIPS-plus (sum)	—	—	-181.69 (156.69)
Control Variables			
Democratisation (Polity 2)	27.41 (223.8)	99.38 (221.74)	97.21 (220.93)
Classic IP leaders	-417.41 (3384.72)	3185 (3723.17)	4195.73 (3717.5)
Countries with a high increase of patent protection	129.66 (2321.11)	-1119.77 (2210.36)	-1077.06 (2203.51)
New IP producers and developers	10.31 (2286.44)	-261.33 (2291.57)	-451.43 (2298.11)
ln GDP	1311.29. (714.86)	1368.01. (717.21)	1369.5. (715.83)
ln GDPpc	572.19 (1193.16)	889.03 (1191.23)	929.77 (1188.88)
ln Geographic distance (mean)	-2998.62* (1253.85)	-2967.89* (1260.18)	-3008.24* (1255.3)
Intercept	-14083.16 (14371.77)	-16355.08 (14607.07)	-16381.6 (14456.47)
Model	m4.8_df_gi	m4.8_df_si	m4.8_df_ti
Observations	462	462	462

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Table 90 thus illustrates the regression results for the general, specific and TRIPS-plus index for the overall IPR measure for *df*. It shows that two of the control variables have significant reoccurring effects on the total *ltp* imports. Namely, GDP (log) has a significantly positive and geographical distance a significantly negative effect. This means that the further apart PTA members are, the lower is the total of *ltp* imports and the higher a countries' GDP, the more low-technology products it imports. However, the number of observations is comparatively low, and the results might not be generalisable.

The general binary variables show pronounced significant effects for both the overall as well as the FC IPR measure. These effects are sometimes the opposite depending on the IPR measure. For example, the variable *ipr_as_investment* has for the overall IPR measure a positive effect (*31'388.2*) and for the FC a negative one (*-26'473.2*). This suggests that if a country defines IPR as investment for the first time in a PTA, there is a significant decrease in *ltp* imports, yet if a country repeatedly includes it in its PTAs, then the *ltp* imports increase substantially compared to the time of PTA signature.

The specific binary variables show significant effects only for the overall IPR measure, namely for the following variables: *ipr_special_requirements_related_border _measures* (*21'744.8*), *ipr_provisional_measure* (*-20'386.4*), *ipr_t_industrial_designs* (*20'262.7*), and *ipr_t_new_plant_varieties* (*-24'180.4*). This indicates that special border measures and specific provisions on industrial designs increase the total *ltp* imports, whilst provisional measures and tangible provisions on new plant varieties decrease them.

The TRIPS-plus additive variables find only one significant effect for the overall measure of *ipr_tripsplus_enforcement* (*1'674.7*). This means that repetitively used IPR enforcement provisions in PTAs, which go beyond the TRIPS regulation, have a positive effect on the total imports of low-technology products.

For the development level, the HIC data shows only significantly negative results for the specific and TRIPS-plus indexes, predominately for the overall measure. The UMIC data has one significantly positive result for the overall general index for *df*, whereas the LMIC data finds no significant results for the IPR indexes. The LIC data has one significant negative result for the overall general index for *df5l* and one significantly positive result for the FC TRIPS-plus measure for *dfl10*. The development level thus alters the effects, but yet again, the number of observations is too low to make generalisable statements.

Ninthly, besides looking at the total imports, I analyse the effect that the design of IPRs in PTAs has on the **PTA member *htp* imports**. The analysis shows no significant results for any of the indexes. *Table 91* on the next page thus displays the insignificant results for the overall general, specific and TRIPS-plus indexes for *df* to illustrate the regression results. It has to be noted, that due to the missing values in the dependent variable, the number of observations is barely above 15%, making the results hardly generalisable.

Unlike the indexes, the control GDP (log) and GDPpc (log) have a significant effect on the *htp* imports from PTA members. For the displayed *df* model, GDP has a positive effect and GDPpc a negative one. This means that countries with a higher GDP are more likely to have more *htp* imports by PTA members after the PTA has entered into force, whilst a higher GDPpc decreases the *htp* imports.

Table 91: Economic Effects Regression – Technology Transfer: PTA Member *htp* Imports

	Overall IPR		
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	-506.6 (712.8)	—	—
Index IPR specific (sum)	—	-642.7 (1396)	—
Index IPR TRIPS-plus (sum)	—	—	-248.2 (601.1)
Control Variables			
Democratisation (Polity 2)	943.9 (892.8)	896.3 (889.6)	901.1 (890.1)
Classic IP leaders	-1840.3 (12651.8)	-1390.2 (13898)	-1449.9 (14233.5)
Countries with a high increase of patent protection	-592.5 (9992.8)	1273.1 (9478.5)	1566.9 (9425.5)
New IP producers and developers	-4704.5 (9395.9)	-4531.2 (9394)	-4617.3 (9411.1)
ln GDP	7321.8* (2914.8)	7319.1* (2921.9)	7244.5* (2912.6)
ln GDPpc	-11252.3* (4883.2)	-11390.4* (4882.1)	-11420.3* (4880.7)
ln Geographic distance (mean)	940.8 (5138.3)	1068.1 (5181)	901.2 (5146.8)
Intercept	-90886 (59056.7)	-93728.9 (60527.8)	-90738.2 (59466.2)
Model	m4.9_df_gi	m4.9_df_si	m4.9_df_ti
Observations	584	584	584

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The general binary variables show multiple significant results for the overall IPR variables. There are reoccurring positive effects for the variables *ipr_assistance_coop_coordination*, *ipr_general_enforcement*, *ipr_investment_dispute_settlement_mechanism*, *ipr_border_measures*, and *ipr_m_geo_indication*s as well as one negative one for *ipr_more_than_1_article*. For instance, this suggests that if countries repeatedly include more than one provision on IPRs, there is a decrease of *htp* imports by PTA members.

The specific binary variables also show only significant effects for the overall IPR measure and none for the FC IPR measure. The analysis shows reoccurring positive effects for *ipr_special_requirements_related_border_measures*, *ipr_transparency*, and *ipr _t_trad_knowledge_genetic_resources* and a negative effect for *ipr_t_copyrights_related _rights*. This indicates, for example, that certain specific enforcement provisions such as special border measures and transparency increase the *htp* imports by PTA members, whilst specific copyright commitments decrease these imports.

The TRIPS-plus additive variables show only reoccurring effects for two overall variables, concretely a positive effect for *ipr_tripsplus_new_plant_varieties* and a negative one for *ipr_tripsplus_industrial_design*. For the FC IPR measure, there is also one significant positive effect of *ipr_tripsplus_trad_knowledge_genetic_resources* for *df*. This means that, for example, if a country includes TRIPS-plus provisions on TK & GR for the first time in a PTA, it increases the *htp* imports by PTA members.

The analysis according to the development level shows that the IPR design in PTAs matter to some income levels whilst others are not significantly affected by it. The HIC data shows multiple significant negative effects for the TRIPS-plus index of the overall IPR measure. The LMIC data has only one significant effect for general IPR index for *df* (*1.256*). There are no significant effects for the UMIC and LIC data. Thus, HIC have fewer *htp* imports by PTA members if they include TRIPS-plus provisions in their PTAs, whereas LMIC have more *htp* imports by PTA members at the time of entry into force of the PTA if they include general IPR provisions in their PTAs.

Tenthly, I examine the **PTA member *mhtp* imports** and, like the results found for the *htp* imports by PTA members, I find no significant results for the IPR indexes. Therefore, *Table 92* simply illustrates the effects for the overall IPR measure of the IPR indexes for *df*. One again, the number of observations is undesirably low due to the missing data for the dependent variable. This might make the results of the regression analysis less reliable than anticipated. Whereas some of the previous variables were significantly affected by the control variables, the *mhtp* imports show no significant effects for any of the tested variables.

Furthermore, there are no significant results for the FC binary and TRIPS-plus additive variables. The overall IPR measure also finds no significant results for the specific binary and TRIPS-plus additive variables, but for the general binary variables. There, the analysis shows three significant results, which are positive for *ipr_assistance_coop_coordination* and *ipr_general_enforcement* as well as negative for *ipr_more_than_1_article*. This suggests that countries repeatedly including more than one article on IPR have fewer *mhtp* imports by PTA members, whilst those repeating IPR assistance, cooperation and coordination resp. general IPR enforcement commitments have more *mhtp* imports.

Table 92: Economic Effects Regression – Technology Transfer: PTA Member *mhtp* Imports

	Overall IPR		
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	-15.27 (28.95)	—	—
Index IPR specific (sum)	—	-36.093 (56.351)	—
Index IPR TRIPS-plus (sum)	—	—	-16.513 (24.192)
Control Variables			
Democratisation (Polity 2)	12.25 (36.55)	11.134 (36.427)	11.657 (36.447)
Classic IP leaders	-338.09 (512.11)	-239.886 (563.13)	-211.493 (575.611)
Countries with a high increase of patent protection	-502.3 (404.9)	-461.329 (383.63)	-447.154 (381.215)
New IP producers and developers	-277.29 (379.58)	-277.474 (379.288)	-285.218 (379.953)
ln GDP	158.59 (118.39)	162.52 (118.715)	159.029 (118.356)
ln GDPpc	-3.75 (198.53)	-3.824 (198.118)	-3.572 (198.046)
ln Geographic distance (mean)	219.25 (210.19)	231.041 (211.888)	223.032 (210.312)
Intercept	-5076.4* (2391.72)	-5335.937* (2449.248)	-5208.597* (2407.986)
Model	m4.10_df_gi	m4.10_df_si	m4.10_df_ti
Observations	575	575	575

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The analysis according the the income-level of countries shows that unlike the general analysis, most categories find some significant effects. The HIC data has significantly positive effects for the FC IPR measure of the general and specific IPR index, whereas the UMIC data finds multiple significant positive effects for all IPR indexes of the overall IPR measure. The LMIC are the only ones, where the *mht*p imports by PTA members are not significantly affected by the IPR indexes. The LIC data is the only one showing significant negative effects for the general IPR index for both overall and FC measure. This suggests that the *mht*p imports by PTA members in LIC are negatively affected by general IPR in PTAs, whereas the *mhtp* imports in both UMIC and HIC are positively affected. Again, the number of observations is even lower for the subgroups than for the general analysis, making these results possibly unreliable.

Eleventhly, I analyse the **PTA member *mltp* imports** and also find no significant effects for the IPR indexes. *Table 93* displays the overall regression analysis for the general, specific and TRIPS-plus indexes for *df*.

Out of the control variables, GDP (log) has a significant positive effect and geographic distance a significant negative one. This implies one the one hand that in countries signing a PTA with PTA members further away, there is a decrease of *mltp* imports from these PTA members. On the other hand, countries with a higher GDP are more likely to import medium-low-technology products by their PTA members.

The general binary variables find some significant results, all for the *df* models. The overall IPR measure finds only negative effects, namely for *ipr_investment_expropriation_exception* and *ipr_implementation*. The FC IPR measure additionally finds positive results for *ipr_investment_dispute_settlement_mechanism*, *ipr_m_patents* and *ipr_m _new_plant_varieties*, as well as negative results for *ipr_as_investment* and *ipr_m_industrial_designs*. This suggests, for instance, that if countries define for the first time in their PTAs IPR as investment, or if the repetitively include general IPR implementation provisions, they experience a decrease of the *mltp* imports by PTA members.

The specific binary variables as well as the TRIPS-plus additive variables have no significant results for any of the models, neither for the overall nor the FC IPR measure.

Table 93: Economic Effects Regression – Technology Transfer: PTA Member *mltp* Imports

	Overall IPR		
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	170.4 (135.2)	—	—
Index IPR specific (sum)	—	-222.6 (265.5)	—
Index IPR TRIPS-plus (sum)	—	—	-138.1 (114)
Control Variables			
Democratisation (Polity 2)	103.4 (169.3)	125.6 (168.8)	130.8 (168.8)
Classic IP leaders	-230.7 (2406.4)	1814.9 (2653.2)	2447.2 (2709.3)
Countries with a high increase of patent protection	107 (1893.2)	-894.2 (1797)	-847.4 (1785.2)
New IP producers and developers	-134 (1777.4)	-343 (1778)	-437.5 (1780.1)
ln GDP	938.7. (552.2)	1013.6. (554.1)	998.9. (552)
ln GDPpc	240.4 (929.1)	441.8 (927.8)	468.1 (926.8)
ln Geographic distance (mean)	-2506.9* (973.5)	-2313.1* (983.3)	-2335.5* (975.4)
Intercept	-5858.6 (11184.3)	-9288.3 (11469.4)	-9019.3 (11264.1)
Model	m4.11_df_gi	m4.11_df_si	m4.11_df_ti
Observations	590	590	590

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The analysis of the data according to countries' development levels shows only a couple of significant effects of the IPR indexes on the *mltp* imports by PTA members. The HIC data finds significantly negative results for the specific and TRIPS-plus indexes, mostly for the overall models as well as the FC IPR measure for *df10l*. The UMIC and LMIC subgroups have no significant results, whereas the LIC data shows one significant effect of the overall general IPR index for *df5l*. The results suggest that the development level of countries matters for the analysis of the *mltp* imports by PTA members and that HIC mostly experience a decrease of imports, UMIC and LMIC are not affected, and LIC show a tendency for more *mltp* imports with general IPRs in PTAs. However, due to the low number of observations of the subgroups, these results have to be considered and generalised carefully.

Twelfthly, I look at the **PTA member *ltp* imports**. This is the only one out of the four technology-intensive measures of imports by PTA members, which shows significant results. However, almost all of the significant results register at a very low level. On the following pages I display in *Table 94* all significant effects found for the overall IPR measure, and in *Table 95* all significant effects except the *dft* models for the FC measure. The overall IPR measure only has significant results for those deltas with the lowest numbers of observation, namely *df10l* and *dft*. These models represent less than 8% of all observations for the IPR design data, and the results are thus most likely unreliable.

Table 94: Economic Effects Regression – Technology Transfer: PTA Member *ltp* Imports I

	Overall IPR		
	df10l	*dft*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	0. (0)	—	—
Index IPR specific (sum)	—	0. (0)	—
Index IPR TRIPS-plus (sum)	—	—	0. (0)
Control Variables			
Democratisation (Polity 2)	0 (0)	0 (0)	0 (0)
Classic IP leaders	0 (0)	0** (0)	0** (0)
Countries with a high increase of patent protection	0 (0)	0 (0)	0 (0)
New IP producers and developers	0 (0)	0 (0)	0 (0)
ln GDP	0** (0)	0*** (0)	0*** (0)
ln GDPpc	0 (0)	0 (0)	0 (0)
ln Geographic distance (mean)	0 (0)	0* (0)	0* (0)
Intercept	-1*** (0)	-1*** (0)	-1*** (0)
Model	m4.12_df10l_gi	m4.12_dft_si	m4.12_dft_ti
Observations	299	289	289

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Besides the effects of the design of IPRs in PTAs, the other variables included in the model also show only marginal impacts, some of them also significant ones. Generally, there are the classic IP leaders, GDP (log) and geographic distance with a significant effect on the *ltp* imports by PTA members.

The results of the overall IPR measure for *dft* in *Table 94* are almost identical to the ones for the FC IPR measure. As they bare no additional insights due to the low level of their estimates, I refrain from displaying them in an additional regression table. The far more interesting effects are displayed in *Table 95* for *df*.

Table 95: Economic Effects Regression – Technology Transfer: PTA Member *ltp* Imports II

	First-comer IPR			
	df	*df3l*	*df5l*	*df5l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	0.012. (0.007)	—	—	—
Index IPR specific (sum)	—	0. (0)	0** (0)	—
Index IPR TRIPS-plus (sum)	—	—	—	0* (0)
Control Variables				
Democratisation (Polity 2)	0.013** (0.004)	0 (0)	0. (0)	0. (0)
Classic IP leaders	-0.061 (0.064)	0** (0)	0*** (0)	0*** (0)
Countries with a high increase of patent protection	0.013 (0.049)	0** (0)	0* (0)	0* (0)
New IP producers and developers	0.043 (0.049)	0 (0)	0 (0)	0 (0)
ln GDP	0.016 (0.015)	0*** (0)	0*** (0)	0*** (0)
ln GDPpc	-0.06* (0.026)	0 (0)	0* (0)	0* (0)
ln Geographic distance (mean)	0.004 (0.027)	0. (0)	0* (0)	0* (0)
Intercept	0.193 (0.305)	-1*** (0)	-1*** (0)	-1*** (0)
Model	m4.12_fc_df_gi	m4.12_fc_df3l_si	m4.12_fc_df5l_si	m4.12_fc_df5l_ti
Observations	623	532	493	493

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The effects take place on a higher level than for all other deltas and show a positive effect of the index IPR general on the *ltp* imports by PTA members. This means that if a country includes in their PTA for the first time (more) general IPR provisions, there is an increase of PTA member *ltp* imports. Furthermore, the table also shows a significantly positive effect of democratisation and a negative one for GDPpc (log), yet only for the *df* model. This would mean that with an increase of democratisation and a decrease of a countries GDPpc, there is an increase of *ltp* imports by PTA members.

The general binary variables mirror the high number of significant effects, yet most of these effects are also restricted to a very low set of estimates. There are no significant results for the specific binary variables nor the TRIPS-plus additive variables for any of the tested models.

The development levels show significant results for all four subgroups. The HIC data finds significant positive results for the specific and TRIPS-plus index for both overall and FC IPR measure. The UMIC data also has multiple significant results for all indexes, whereby the most significant ones are significantly negative. The LMIC data shows two significant positive results for the general IPR index yet with fairly low estimates. And the LIC data has multiple significant results, which are all negative except the IPR general for *df10l* (which has the lowest number of observations). The number of observations is especially low, and the results might not be generalisable. So far, the analysis suggests that HIC mostly see an increase of *ltp* imports by PTA members with more specific and TRIPS-plus commitments in their PTAs, whereas UMIC and LIC predominately are faced with a decrease of *ltp* imports by PTA members if they increase the IPR content of their PTAs.

In summary, the IPR indexes have a significant effect on technology transfer. The trend is predominately positive for the overall IPR measure, i.e. the reoccurring IPR provisions, whereas the FC IPR measure, reflecting provisions firstly mentioned in a countries PTA, shows mostly negative effects. However, a majority of the dependent measures for technology transfer have only a limited number of observations impeding general statements about the relationship between the design of IPRs in PTAs and technology transfer.

5.2.3.5 Growth Economic Effect Analysis

The following section describes the analysis for the four growth measures GDP, GDP per capita, GDP growth rate and GDP per capita growth rate. Only the latter finds no significant effects for the IPR indexes.

Firstly, the results for the **GDP** development shows multiple significant effects of the IPR indexes for both the overall as well as the FC IPR measure. *Table 96* and *Table 97* display the significant results for the overall IPR measure, whereas *Table 98* and *Table 99* illustrate the FC IPR measure effects.

Table 96 shows negative effects for the overall specific and TRIPS-plus indexes for both *df* as well as *df3l*, whereby the effects become more distinct over time. The general provisions seem to have no significant effect on GDP for these deltas.

The control variables only show a significant effect for the *df3l* models, whereby democratisation and geographic distance have a significantly negative effect on GDP. The effect of the former is on a lower level than the effect of the IPR measure, yet the effect of geographic distance is more pronounced. This suggests that when the distance between PTA members increases and the level of democratisation increases, there might be a decrease of GDP between PTA signature and three years after the PTA has entered into force. In these models, the other control variables have no significant effects on GDP.

Table 96: Economic Effects Regression – Growth: GDP I

	Overall IPR			
	df	*df*	*df3l*	*df3l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	—	—	—	—
Index IPR specific (sum)	-0.01*** (0.002)	—	-0.03*** (0.004)	—
Index IPR TRIPS-plus (sum)	—	-0.005*** (0.001)	—	-0.011*** (0.002)
Control Variables				
Democratisation (Polity 2)	0 (0.001)	-0.001 (0.001)	-0.007** (0.002)	-0.007*** (0.002)
Classic IP leaders	0.013 (0.014)	0.018 (0.014)	0.03 (0.03)	0.026 (0.03)
Countries with a high increase of patent protection	0.003 (0.013)	0.004 (0.013)	0.013 (0.028)	0.018 (0.028)
New IP producers and developers	-0.005 (0.016)	-0.008 (0.016)	0.051 (0.035)	0.045 (0.035)
ln Geographic distance (mean)	0.002 (0.007)	0.001 (0.007)	-0.03. (0.016)	-0.036* (0.016)
Intercept	0.128* (0.055)	0.136* (0.055)	0.743*** (0.124)	0.783*** (0.123)
Model	5.1_df_si	5.1_df_ti	m5.1_df3l_si	m5.1_df3l_ti
Observations	2970	2970	2764	2764

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Same as *Table 96*, *Table 97* on the next page displays the significant overall IPR effect, yet for the *df5l* and *dft* models. It also shows significant negative effects for the specific and TRIPS-plus indexes, which become more distinct over time (estimates *df5l* > estimates *df3l* > estimates *df*). The effect of the control variables also develops accordingly.

Additionally, the *dft* model shows a significant positive effect for the index IPR general. This makes it the only GDP model with a positive effect of an overall IPR index. Moreover, after the *dft* GDP is also significantly affected by some of the control variables, namely positively by countries with a high increase of patent protection and negatively by new IP producers and developers. However, this effect is only visible for the model including the index IPR general and thus not generalisable.

Table 97: Economic Effects Regression – Growth: GDP II

	Overall IPR			
	df5l	*df5l*	*dft*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	—	—	0.01*** (0.001)	—
Index IPR specific (sum)	-0.041*** (0.009)		—	-0.004. (0.002)
Index IPR TRIPS-plus (sum)	—	-0.015*** (0.004)	—	—
Control Variables				
Democratisation (Polity 2)	-0.016*** (0.004)	-0.017*** (0.004)	-0.001 (0.001)	0.001 (0.001)
Classic IP leaders	0.029 (0.057)	0.017 (0.057)	-0.018 (0.016)	0.015 (0.016)
Countries with a high increase of patent protection	0.042 (0.053)	0.048 (0.053)	0.035* (0.015)	0.011 (0.015)
New IP producers and developers	0.004 (0.066)	-0.003 (0.066)	-0.043* (0.018)	-0.023 (0.019)
ln Geographic distance (mean)	-0.068* (0.03)	-0.075* (0.03)	-0.042*** (0.008)	-0.023** (0.009)
Intercept	1.382*** (0.233)	1.434*** (0.232)	0.451*** (0.064)	0.339*** (0.066)
Model	m5.1_df5l_si	m5.1_df5l_ti	m5.1_dft_gi	m5.1_dft_si
Observations	2653	2653	2786	2786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The results suggest that repetitively including general provisions on IPRs in PTAs has a positive effect on GDP after the transition period has ended, whereas repeating specific and TRIPS-plus commitments has a significantly negative effect, especially after for the intermediate time lags (*df3l* and *df5l*).

The FC IPR measure shown in the following *Table 98* and *Table 99* indicates another relationship between GDP and IPR design. Firstly, the general IPR index scores positively across all FC models and shows an increased impact over time. Thus, unlike for the overall IPR measure, those countries including general IPR commitments in their PTAs for the first time, are significantly more likely to experience an increased GDP across all time deltas. Secondly, the significant results of the specific and TRIPS-plus indexes are less frequent than for the overall IPR measure.

The control variables mostly show similar results as for the overall IPR measure, which means a significantly negative effect of democratisation and geographic distance.

Table 98: Economic Effects Regression – Growth: GDP III

	First-comer IPR				
	df	*df3l*	*df3l*	*df5l*	*df5l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	0.014*** (0.002)	0.047*** (0.005)	—	0.069*** (0.009)	—
Index IPR specific (sum)	—	—	—	—	-0.028. (0.016)
Index IPR TRIPS-plus (sum)	—	—	-0.011** (0.003)	—	—
Control Variables					
Democratisation (Polity 2)	0 (0.001)	-0.006** (0.002)	-0.008*** (0.002)	-0.015*** (0.004)	-0.018*** (0.004)
Classic IP leaders	-0.021 (0.013)	-0.063* (0.03)	-0.005 (0.03)	-0.083 (0.056)	-0.01 (0.056)
Countries with a high increase of patent protection	0.014 (0.013)	0.046 (0.028)	0.031 (0.028)	0.086. (0.052)	0.064 (0.053)
New IP producers and developers	-0.01 (0.016)	0.04 (0.035)	0.032 (0.035)	-0.015 (0.065)	-0.026 (0.066)
ln Geographic distance (mean)	-0.017* (0.007)	-0.087*** (0.016)	-0.052** (0.016)	-0.14*** (0.03)	-0.092** (0.03)
Intercept	0.259*** (0.054)	1.133*** (0.12)	0.907*** (0.122)	1.865*** (0.228)	1.561*** (0.229)
Model	m5.1_fc_df_gi	m5.1_fc_df3l_gi	m5.1_fc_df3l_ti	m5.1_fc_df5l_gi	m5.1_fc_df5l_si
Observations	2970	2764	2764	2653	2653

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Table 99 displays significantly positive results of all three IPR indexes for *dft*. This means that after the transition period has ended, countries including general, specific and TRIPS-plus commitments for the first time in one of their PTAs have an increased GDP compared to the time of PTA signature. The effect of the specific and TRIPS-plus indexes on GDP is thus ambiguous across different time measures.

Table 98 and *Table 99* show also that the effects for the specific IPR and TRIPS-plus indexes generally operate on a lower significance level than the results for the general IPR index. Moreover, the general IPR index shows higher estimates for the identical time deltas. It can, therefore, be assumed that the index IPR general has the most significant effect on GDP amongst the IPR indexes indeed. The number of observations is comparable across time deltas, making the results reliable.

Table 99: Economic Effects Regression – Growth: GDP IV

	First-comer IPR				
	df5l	*df10l*	*dft*	*dft*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	—	0.08** (0.028)	0.021*** (0.002)	—	—
Index IPR specific (sum)	—	—	—	0.012* (0.005)	—
Index IPR TRIPS-plus (sum)	-0.016* (0.007)	—	—	—	0.006** (0.002)
Control Variables					
Democratisation (Polity 2)	-0.018*** (0.004)	-0.052*** (0.013)	0.002 (0.001)	0.001 (0.001)	0.001 (0.001)
Classic IP leaders	0 (0.057)	-0.303. (0.176)	-0.007 (0.016)	0.004 (0.016)	0.002 (0.016)
Countries with a high increase of patent protection	0.062 (0.053)	-0.009 (0.181)	0.019 (0.015)	0.014 (0.015)	0.014 (0.015)
New IP producers and developers	-0.026 (0.066)	-0.084 (0.261)	-0.022 (0.018)	-0.028 (0.019)	-0.028 (0.019)
ln Geographic distance (mean)	-0.086** (0.03)	-0.38*** (0.096)	-0.038*** (0.008)	-0.029*** (0.008)	-0.03*** (0.008)
Intercept	1.518*** (0.231)	4.812*** (0.735)	0.437*** (0.063)	0.378*** (0.064)	0.389*** (0.064)
Model	m5.1_fc_df5l_ti	m5.1_fc_df10l_gi	m5.1_fc_dft_gi	m5.1_fc_dft_si	m5.1_fc_dft_ti
Observations	2653	2301	2786	2786	2786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The general binary variables show multiple significant results for both the overall as well as the FC IPR measure. For instance, there are reoccurring positive results for the overall and FC variables of *ipr_general_enforcement* and *ipr_m_undisclosed_information* resp. negative ones for *ipr_as_investment*, *ipr_border_measure*s and *ipr_m_layout_design_integ_circuits*. This suggests that, on the one hand, general measures on enforcement and undisclosed information have a positive effect on GDP. Hereby, the effect occurs for countries including these measures for the first time as well as those repetitively including them in their PTAs. On the other hand, countries defining IPR as investment, only including general border measures on IPR and mentioning layout-designs of integrated circuits in a general manner in their PTAs experience a negative effect on GDP.

The specific binary variables show fewer yet also a couple of significant reoccurring effects, which are exclusively negative. For the overall IPR measure, these negative effects are seen for *ipr_committee* and *ipr_t_copyrights_related_rights*, and for FC there is only one effect for *ipr_service_provider_liability*. This indicates that repetitive specific measures on IPR committees and coprights as well as firstly including commitments on service provider liability lead to a decrease in GDP.

The TRIPS-plus additive variables find only negative effects for the overall IPR measure, namely for *ipr_tripsplus_copyrights_related_rights* and *ipr_tripsplus_geo_indications*, whereas the FC IPR measure finds a positive effect of *ipr_tripsplus_trademarks* and a negative one for *ipr_tripsplus_exhaustion*. This means that TRIPS-plus measures on copyrights, geographical indications, trademarks and exhaustion have a negative effect on GDP.

The analysis of the four development-level subgroup shows similar results as the previous regression analysis. The HIC data finds multiple significant results for both the overall and FC IPR measures across all IPR indexes, whereby all results are negative except for the IPR general for *dft*. These results largely mirror the effects found for the regression on the total dataset. The UMIC data also shows multiple significant results with both positive and negative effects across all indexes and overall and FC IPR measures. For the LMIC data, there are mainly significant positive effects for the overall and FC IPR measures, but only for the index IPR general. The LIC data also finds multiple significant effects across all IPR indexes with both positive and negative effects. The level of development thus seems to reflect mostly the results already found in the general analysis and the income-level of countries seems, therefore, less influential for the effect of IPR design on GDP.

Secondly, for the development of **GDP per capita**, the analysis finds multiple significant results. *Table 100* and *Table 101* show the significant effects for the overall IPR measure, and *Table 102* contains the ones for the FC IPR measure.

Table 100 shows the effects for *df* and *df3l*, which are positive for the general IPR index of *df* resp. negative for the specific and TRIPS-plus indexes for both *df* and *df3l*. The specific and TRIPS-plus indexes have a more pronounced explanatory power than the effect of the general IPR index and operate on a higher significance level. This means that countries, which repeatedly include specific or TRIPS-plus provisions in their PTAs, are more likely to be faced with a decrease of GDPpc.

Most of the control variables show no significant effects on the GDPpc. Only the geographical distance shows a reoccurring significant negative effect, which means that with an increase in the distance between PTA partners, there is a decrease in the GDPpc.

Table 100: Economic Effects Regression – Growth: GDPpc I

	Overall IPR				
	df	*df*	*df*	*df3l*	*df3l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	0.002. (0.001)	—	—	—	—
Index IPR specific (sum)	—	-0.009*** (0.002)	—	-0.027*** (0.004)	—
Index IPR TRIPS-plus (sum)	—	—	-0.004*** (0.001)	—	-0.01*** (0.001)
Control Variables					
Democratisation (Polity 2)	0.001 (0.001)	0.002. (0.001)	0.002. (0.001)	0.001 (0.002)	0 (0.002)
Classic IP leaders	-0.012 (0.013)	0.014 (0.013)	0.02 (0.013)	0.028 (0.026)	0.024 (0.026)
Countries with a high increase of patent protection	0.019 (0.012)	0.009 (0.012)	0.01 (0.012)	0.021 (0.025)	0.025 (0.025)
New IP producers and developers	-0.009 (0.015)	0 (0.015)	-0.002 (0.015)	0.056. (0.031)	0.05 (0.031)
ln Geographic distance (mean)	-0.019** (0.007)	-0.006 (0.007)	-0.007 (0.007)	-0.05*** (0.014)	-0.055*** (0.014)
Intercept	0.24*** (0.051)	0.152** (0.051)	0.156** (0.051)	0.77*** (0.108)	0.804*** (0.107)
Model	m5.2_df_gi	m5.2_df_si	m5.2_df_ti	m5.2_df3l_si	m5.2_df3l_ti
Observations	2970	2970	2970	2764	2764

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Table 101 continues the significant results for the overall IPR measure and shows that the effects remain positive for the index IPR general resp. negative for the indexes IPR specific and TRIPS-plus. For the *dft* model, only the general index has a significant effect on GDPpc, whereas for the *df5l* model all three indexes score significantly. Similar to the effects for GDP, the estimates of the specific and TRIPS-plus indexes for the GDPpc regression analysis increase over time and become more pronounced.

As already shown for the previous time deltas, the control variables have no constant reoccurring effects. The most constant one can be found again for the geographic distance between PTA members, which shows a negative effect between an increase in distance and GDPpc.

Table 101: Economic Effects Regression – Growth: GDPpc II

	Overall IPR			
	df5l	*df5l*	*df5l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	0.005. (0.003)	—	—	0.009*** (0.001)
Index IPR specific (sum)	—	-0.037*** (0.007)	—	—
Index IPR TRIPS-plus (sum)	—	—	-0.014*** (0.003)	—
Control Variables				
Democratisation (Polity 2)	-0.004 (0.003)	-0.002 (0.003)	-0.002 (0.003)	0.001 (0.001)
Classic IP leaders	-0.051 (0.045)	0.013 (0.044)	0.002 (0.044)	-0.022 (0.015)
Countries with a high increase of patent protection	0.08. (0.042)	0.05 (0.041)	0.055 (0.041)	0.039** (0.014)
New IP producers and developers	-0.016 (0.052)	0.02 (0.052)	0.014 (0.052)	-0.035* (0.017)
ln Geographic distance (mean)	-0.129*** (0.023)	-0.098*** (0.024)	-0.104*** (0.024)	-0.05*** (0.008)
Intercept	1.611*** (0.18)	1.392*** (0.182)	1.436*** (0.182)	0.477*** (0.06)
Model	m5.2_df5l_gi	m5.2_df5l_si	m5.2_df5l_ti	m5.2_dft_gi
Observations	2653	2653	2653	2786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Table 102: Economic Effects Regression – Growth: GDPpc III

	First-comer IPR				
	df	*df3l*	*df3l*	*df5l*	*df5l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	0.012*** (0.002)	0.039*** (0.004)	—	0.054*** (0.007)	—
Index IPR specific (sum)	—	—	—	—	-0.025* (0.013)
Index IPR TRIPS-plus (sum)	—	—	-0.01*** (0.003)	—	—
Control Variables					
Democratisation (Polity 2)	0.002. (0.001)	0.001 (0.002)	-0.001 (0.002)	-0.001 (0.003)	-0.003 (0.003)
Classic IP leaders	-0.016 (0.012)	-0.053* (0.026)	-0.003 (0.026)	-0.081. (0.044)	-0.022 (0.044)
Countries with a high increase of patent protection	0.019 (0.012)	0.049* (0.024)	0.037 (0.025)	0.087* (0.041)	0.069. (0.041)
New IP producers and developers	-0.004 (0.015)	0.045 (0.03)	0.038 (0.031)	0.001 (0.051)	-0.007 (0.052)
ln Geographic distance (mean)	-0.023*** (0.007)	-0.099*** (0.014)	-0.07*** (0.014)	-0.157*** (0.023)	-0.119*** (0.023)
Intercept	0.266*** (0.05)	1.108*** (0.105)	0.915*** (0.106)	1.794*** (0.179)	1.551*** (0.18)
Model	m5.2_fc_df_gi	m5.2_fc_df3l_gi	m5.2_fc_df3l_ti	m5.2_fc_df5l_gi	m5.2_fc_df5l_si
Observations	2970	2764	2764	2653	2653
	df5l	*df10l*	*dft*	*dft*	*dft*
Index IPR general (sum)	—	0.055** (0.017)	0.018*** (0.002)	—	—
Index IPR specific (sum)	—	—	—	0.01* (0.004)	—
Index IPR TRIPS-plus (sum)	-0.014** (0.005)	—	—	—	0.005* (0.002)
Control Variables					
Democratisation (Polity 2)	-0.003 (0.003)	-0.008 (0.008)	0.004*** (0.001)	0.003** (0.001)	0.003** (0.001)
Classic IP leaders	-0.013 (0.044)	-0.314** (0.104)	-0.01 (0.015)	0.001 (0.015)	-0.001 (0.015)
Countries with a high increase of patent protection	0.068 (0.041)	0.013 (0.107)	0.023. (0.014)	0.019 (0.014)	0.019 (0.014)
New IP producers and developers	-0.008 (0.052)	-0.018 (0.154)	-0.015 (0.017)	-0.02 (0.017)	-0.02 (0.017)
ln Geographic distance (mean)	-0.114*** (0.023)	-0.395*** (0.057)	-0.046*** (0.008)	-0.037*** (0.008)	-0.039*** (0.008)
Intercept	1.512*** (0.181)	4.352*** (0.435)	0.457*** (0.06)	0.406*** (0.06)	0.414*** (0.06)
Model	m5.2_fc_df5l_ti	m5.2_fc_df10l_gi	m5.2_fc_dft_gi	m5.2_fc_dft_si	m5.2_fc_dft_ti
Observations	2653	2300	2786	2786	2786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Table 102 displays that the index IPR general has a significantly positive effect on GDPpc for all FC IPR models. This is the same relationship already discovered for the GDP regression analysis. The table also shows that the effects of the specific and TRIPS-plus indexes are less consistently significant across the time dimensions and that their direction is ambiguous. Whereas they show negative effect for *dfl3* and *dfl5*, the effects are positive for *dft*.

Furthermore, the regression also shows that the control variable geographic distance has a far more pronounced effect than any of the IPR indexes. The effect is significantly negative across all FC models, which means that an increase in the distance amongst PTA members decreases a countries' GDPpc. It is, therefore, more beneficial for the GDPpc to sign PTAs with neighbouring countries than countries further away. The other control variables sporadically show a significant effect, yet not consistently enough to make general statements on the effect on GDPpc.

The general binary variables show multiple significant effects for both the overall and the FC IPR measure. For both IPR measures, there are positive effects for *ipr_general_enforcement*, *ipr_m_undisclosed_information*, *ipr_m_new_plant_varieties* and *ipr _m_trad_knowledge_genetic_resources*, resp. negative effect for *ipr_as_investment* and *ipr_border_measures*. This means, for instance, that general enforcement measures in PTAs increase GDPpc whereas defining IPR as investment has the opposite effect.

The specific binary variables have exclusively negative effects, be it for the overall IPR measure and the variable *ipr_committee* and *ipr_t_copyrights_related_rights*, or the FC IPR measure for *ipr_service_provider_liability* and *ipr_committee*. This means that IPR committees in PTAS per se have a negative effect on GDPpc, regardless if they are novel or repetitive commitments.

The TRIPS-plus additive variables find negative effects for the overall IPR measure of *ipr_tripsplus_copyrights_related_rights* and *ipr_tripsplus_geo_indications* as well as one positive effect for the FC measure for *ipr_tripsplus_trademarks* and a negative one for *ipr_tripsplus_exhaustion*. For example, this indicates that repetitive TRIPS-plus provisions on copyrights and geographical indications increase a countries GDPpc, whereas novel TRIPS-plus provisions on trademarks in a PTA have the opposite impact.

The development level analysis mirrors largely the effects found for the comprehensive regression analysis. The HIC data finds multiple significant effects for both the overall and FC IPR measure, which are all negative except for the general IPR index for *dft*.

The UMIC data finds for the overall and FC IPR measures significantly positive and negative effects across all models. For the LMIC data, there is only one negative effect for the index IPR specific. Otherwise there are only positive effects for the general IPR index for both the overall and FC IPR measure. The LIC data finds multiple significant effects across all indexes, whereby the index IPR general has only positive results, and the other two indexes have both negative as well as positive results.

Thirdly, the **GDP growth rate** finds one significant result for the overall general index, but none for the FC IPR measure. *Table 103* displays this result found in the *df5l* model. The clear positive effect suggests that with an increase of general IPR provisions repeatedly mentioned in PTAs, a country increases its GDP growth rate. However, as none of the other models shows any effects of the IPR indexes, the effect has to be considered carefully before making general statements on the effect of the design of IPRs in PTAs. It is only significant for the intermediate analysis (*df5l*), and not per se generally.

Table 103: Economic Effects Regression – Growth: GDP Growth Rate

	Overall IPR *df5l*
Variables	Estimates (Std. Error)
Index IPR general (sum)	0.147* (0.072)
Index IPR specific (sum)	—
Index IPR TRIPS-plus (sum)	—
Control Variables	
Democratisation (Polity 2)	0.003 (0.075)
Classic IP leaders	0.448 (0.998)
Countries with a high increase of patent protection	-2.807** (0.945)
New IP producers and developers	2.976* (1.164)
ln Geographic distance (mean)	-0.525 (0.528)
Intercept	3.167 (4.045)
Model	m5.3_df5l_gi
Observations	2544

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

However, there are also two control variables, which show an immensely more distinct effect than the general IPR index. Countries with a high increase of patent protection – Brazil, China, India and Mexico – have a significantly negative effect on the GDP growth rate, whereas new IP producers and developers – Israel, South Korea, Singapore and Taiwan – have a significantly positive one. This means if one of the former countries is amongst the PTA members, a country is more likely to experience a decrease in the GDP growth rate resp. if one of the former countries is included, an increase in the GDP growth rate. The other control variables show no significant effects.

The general binary variables show three reoccurring negative effects for the overall IPR measure of *ipr_more_than_1_article* and *ipr_m_new_plant_varieties* as well as for FC IPR measure of *ipr_investment_mfn*. For instance, this indicates that countries repeatedly including more than one article on IPRs are more likely to face a decrease in the GDP growth rate.

The specific binary variables only find a significant effect for the FC IPR measurement, namely reoccurring positive effect for *ipr_criminal_procedures_remedies* and negative ones for *ipr_service_provider_liability*. This suggests that including commitments on criminal procedures and remedies for the first time in a PTA increases a countries' GDP growth rate, whilst the effect is inverted for provisions on service provider liability.

The TRIPS-plus additive variables have no significant effects for the overall IPR measure and only one effect for the FC measure of *ipr_tripsplus_undisclosed_information* for *dft* (-*5.095*). This suggests that most of the TRIPS-plus variables in PTAs have no significant effect on the GDP growth rate. Only TRIPS-plus provisions on undisclosed affect the GDP growth rate, yet negatively.

The analysis according to the development level of countries highlights that the effects differ based on the income level of countries. The HIC data shows significant positive results for both the overall (*df5l*, *df10l*) and FC measure (*df3l*, *dft*) of the index IPR general. The UMIC data finds significantly positive results for the overall general and TRIPS-plus index, whereas the LMIC data has one significant positive effect for TRIPS-plus index of the overall IPR measure. The LIC data finds multiple significant positive effects for all IPR indexes of both the overall and FC IPR measure. This suggests that the GDP growth rate of LIC generally profits significantly from including general, specific and TRIPS-plus provisions in PTAs, whereas for the HIC only the general commitments in PTAs have a significant impact.

Fourthly, the **GDPpc growth rate** also shows no significant results for the IPR indexes. *Table 104* thus displays the effects for the overall IPR measure for *df* to illustrate the results.

The regression shows that unlike the IPR indexes, the control variables have a significant effect on the GDPpc growth rate. Both the classic IP leaders as well as countries with a high increase of patent protection have a significant positive result, meaning that if the US, EU, EFTA and Japan or even more so if Brazil, China, India and Mexico are part of a countries' PTA, there is a significant increase of the countries' GDPpc growth rate.

Table 104: Economic Effects Regression – Growth: GDPpc Growth Rate

	Overall IPR		
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Index IPR general (sum)	0.089 (0.167)	—	—
Index IPR specific (sum)	—	-0.085 (0.304)	—
Index IPR TRIPS-plus (sum)	—	—	-0.054 (0.115)
Control Variables			
Democratisation (Polity 2)	-0.204 (0.192)	-0.18 (0.189)	-0.179 (0.189)
Classic IP leaders	4.184. (2.508)	4.694. (2.526)	4.841. (2.536)
Countries with a high increase of patent protection	7.992** (2.428)	7.726** (2.408)	7.715** (2.403)
New IP producers and developers	-4.018 (2.957)	-3.831 (2.954)	-3.833 (2.949)
ln Geographic distance (mean)	-1.914 (1.324)	-1.671 (1.337)	-1.642 (1.32)
Intercept	12.856 (10.163)	11.304 (10.331)	11.077 (10.22)
Model	m5.4_df_gi	m5.4_df_si	m5.4_df_ti
Observations	2868	2868	2868

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

The general binary variables show only one significant effect for the overall IPR measure for *df3l*, namely for *ipr_border_measures* (*3.176*), and multiple significant effects for the FC IPR measure, also for *df3l*. Concretely, there is a significantly positive effect for *ipr_implementation* (*8.267*), *ipr_m_industrial_designs* (*9.983*) and *ipr_m_new_plant_varieties* (*6.186*), resp. a negative one for *ipr_1_article* (-8.038), *ipr_nt* (*-4.908*), *ipr_as_investment* (*-20.804*), and *ipr_m_layout_design_integ_circuits* (*-6.245*). This suggests, for example, that repeating general statements on IPR border measures increased the GDPpc growth rate, whereas countries' first time defining IPR as investment in a PTA has a substantially negative effect on the GDPpc growth rate.

The specific binary variables show only two significant effects for the overall IPR measure for *ipr_t_industrial_designs* (*-10.14*) and *ipr_t_trad_knowledge_genetic_resources* (*-5.109*), and one significant effect for the FC IPR measure for *ipr_committee* (*7.903*). This means that countries, which repeatedly include specific provisions on industrial design and TK & GR are more likely faced with a decrease of the GDPpc growth rate.

The TRIPS-plus additive variables also find three significant effects, whereby there are two overall effects for *ipr_tripsplus_industrial_design* (*-7.315*) and *ipr_tripsplus _new_plant_varieties* (*7.543*), and one for the FC measure for *ipr_tripsplus_new _plant_varieties* (*9.416*). This indicates that same as for the specific provisions, including TRIPS-plus commitment on industrial design in a PTAs, leads to a decrease of the GDPpc growth rate, whereas TRIPS-plus provisions on new plant varieties have a positive effect.

The development level shows different results for the subgroups of countries. The HIC data finds significant results for the overall specific and TRIPS-plus indexes for *df* and the general index for *df10l*, whereby all of the effects are significantly negative. For the UMIC and LMIC data, there are no significant results. The LIC data shows two significantly positive effects for the overall general IPR for *df5l* and for *df10l*. The design of IPRs in PTAs thus clearly has diverging effects on the GDPpc growth rate depending on the income level of countries. Whereby HIC experience a decrease of the GDPpc growth rate if they include general, specific and TRIPS-plus provisions repetitively in their PTAs, LIC countries benefit from repeating general IPR commitments in their PTAs.

In summary, the IPR indexes show a significant result on growth, predominately for the GDP and GPDpc development and not the resp. growth rate. The effects are mostly negative for the overall IPR measure and barely more often positive than negative for the FC IPR measure. A majority across all measures suggest that growth is negatively affected by the design of IPRs in PTAs.

5.2.4 *Summary of Economic Effects Analysis*

The economic effect analysis has shown that the design of IPRs in PTAs has a significant effect on many of the factors postulated in the rationale of IPRs in PTAs. However, the direction of these effects is often the opposite of the assumed theoretical relationship. *Table 105* summarises the factors, the postulated hypotheses and the direction of the significant regression results for the IPR indexes found in the analysis of the economic effects.

Table 105: Conclusion Overview for the Economic Effects Hypotheses

Factor	Hypotheses		Proposed Relation	Statistical Relation	O	FC
Investment in R&D	H1.1	Stringent IPR provisions in PTAs increase investment in R&D.	Positive	General IPR:	+	–
				Specific IPR	–	–
				TRIPS-plus:		
	H1.2	Stringent IPR enforcement provisions in PTAs drive the increase of investment in R&D.	Positive	General IPR	+/–	+/–
				Specific IPR	+/–	+/–
				TRIPS-plus	+	+
FDI	H2.1	Stringent IPR provisions in PTAs increase FDI.	Positive	General IPR:		
				Specific IPR:		
				TRIPS-plus:		
Licensing	H2.2	Stringent IPR provisions in PTAs increase licensing.	Positive	General IPR:	+/–	+
				Specific IPR:		
				TRIPS-plus:		
Innovation	H3.1	Stringent IPR provisions in PTAs increase innovation.	Positive	General IPR:	–	–
				Specific IPR:	–	–
	H3.2	TRIPS-plus provisions in PTAs decrease innovation.	Negative	TRIPS-plus:	–	–
Technology Transfer	H4	Stringent IPR provisions in PTAs increase technology transfer.	Positive	General IPR:	+	+/–
				Specific IPR:	+	+
				TRIPS-plus:	+/–	+/–
Growth	H5	Stringent IPR provisions in PTAs increase growth.	Positive	General IPR:	+/–	+
				Specific IPR:	–	+/–
				TRIPS-plus:	–	+/–

Table 105 illustrates that all except one hypothesis anticipate a positive effect of the stringent IPR features of PTAs, i.e. the specific and or TRIPS-plus indexes. However, the results predominately show either ambiguous or negative effects. Only for the factors of investment in R&D and technology transfer, the postulated hypotheses match the results found in the regression analysis unambigously. In the following paragraphs, I make a brief summary of each factor and its hypotheses.

For investment in R&D, the general analysis finds significantly negative effects of the specific IPR provisions and only a negative effect for the general IPR variables. This means that *H1.1* is overthrown as stringent IPRs have no positive effect on the investment in R&D. However, *H1.2* is reaffirmed by analysis, as for the subgroup of IPR enforcement variables, there is a significantly positive effect for the TRIPS-plus variables as well as an ambiguous one for the specific index. This means that stringent IPR enforcement provisions in PTAs indeed increase the investment in R&D.

For FDI, none of the regressions shows any significant effects. Therefore, *H2.1* has to be rejected as there are no significant results reaffirming a positive effect of stringent IPR on FDI. This is astonishing in so far as FDI is one of the most prominent factors used to promote the positive effects of IPRs.

For licensing, the regression analysis finds significant positive effects, yet only for the general IPR variables. As the hypothesis assumes that only stringent IPR provisions have a significant effect, *H2.2* also has to be rejected. However, there is a significantly positive between IPRs in PTAs and licensing, whereby it is sufficient to include general IPR commitments to achieve an increase in licensing.

For innovation, the four tested measures find significant results suggesting a clear negative effect of the general, specific and TRIPS-plus IPR design features on innovation. The idea behind the hypotheses for innovation was that there is a positive effect of IPR on innovation but that there might be a tipping point, where the positive effects become negative. However, the results show that the effect of IPRs in PTAs is per se negative on innovation. This means that *H3.1* has to be rejected, and *H3.2* is accepted, with a cautionary note. The underlying theoretical assumption of *H3.2* has to be revisited as there is no previous positive effect of IPRs in PTAs on innovation.

For technology transfer, I tested twelve measures on applications for IPRs and imports of IPR-intensive goods. Across the measures, the regression analysis shows a positive effect of specific IPR provisions on technology transfer and *H4* can, therefore, be accepted. However, the analysis also shows mixed results for the TRIPS-plus measures, meaning that not all stringent IPR factors have the same effect. Moreover, certain measures for technology transfer are not affected in a significant manner, whereas other positive effects operate on a very low level. Further, the results for technology transfer have to be treated prudently as the number of observations for the dependent variables is fairly low, making the results less generalisable than desired. The results for the analysis of technology transfer have to be repeated with a more comprehensive dataset on the dependent variables.

For growth, the effects show predominately significant negative effects of the stringent IPR indexes and mostly positive effects of the general IPR index. However, the FC IPR measure accounting for PTAs firstly including any given IPR provision shows next to some significant negative effects also some significant positive effects of the stringent IPR indexes. Thus, *H5* can only be tentatively and partially accepted for the FC IPR measures. For the comprehensive analysis of stringent IPRs in PTAs, *H5* has to be rejected as a majority of the effects are negative. Nevertheless, the analysis shows that a plurality of the general IPR commitments has a significantly positive effect on growth. Unlike anticipated in the hypothesis, growth is decreased by stringent IPRs in PTAs but increased by general IPR provisions.

Conclusively, almost all hypothesis on the economic effects have to be rejected, either because the analysis finds no significant effects and even more often because the effect of the design of IPRs in PTAs is negative and not as postulated by the rationale of IPRs in PTAs positive.

Besides the analysis of the IPR indexes representing the additive content of general, specific and TRIPS-plus commitments in PTAs, I also looked at the possible effect individual binary IPR variables can have on five factors. The results show that mostly the general binary variables affect the factors, but there are also tendencies for specific and TRIPS-plus variables. However, these results are not generalisable as they reflect tendencies for specific factors rather than concrete evidence of a relation.

Further, I also took into account the development level of countries because previous research has suggested that the development level of countries significantly alters the effects of IPRs in PTAs. So, for every factor, I ran the regression models additionally for the four income-level subgroups HIC, UMIC , LMIC and LIC. The results suggest that there is indeed a difference in how countries are affected by the design of IPRs. Unlike generally assumed, there is not a clear divide between how the high-income countries are affected versus the effects on low-income countries. Only for very few cases, the effects of these income-levels are entirely inverted. For instance, for PTA member applications for industrial designs HIC are negatively affected by IPR design features and LIC positively, whereas for PTA member *mhtp* imports the effects are reversed. Furthermore, there are plenty of measures where the subgroups show no significant effects. Generally, the HIC are affected most often positively as well as negatively by the design of IPRs in

PTAs. *Table 106* summarises the significant effects of the IPR indexes on the five factors for each income-level subgroup.

Table 106: Overview for the Significant Economic Effects by Countries' Development Level

Factor	HIC	UMIC	LMIC	LIC
Investment in R&D				
Investment in R&D	+ / –	–	+ / –	+
FDI/ Licensing				
FDI	+			
Licensing	+ / –	+		+
Innovation				
Researchers in R&D	+ / –	+ / –	–	
Resident applications for trademarks (cumulative)	+ / –	+		
Resident applications for industrial designs (cumulative)	+ / –	–	+	
Resident applications for patents (cumulative)	+ / –	+ / –	–	+
Technology Transfer				
Total applications for industrial designs (cumulative)	+ / –	+		
Total applications for patents (cumulative)	+ / –	+ / –	–	–
PTA member applications for industrial designs (cumulative)	–	+	–	+
PTA member applications for patents (cumulative)	+ / –	–		+
Total *htp* imports	+	+	+	+ / –
Total *mhtp* imports	+	+	+	+ / –
Total *mltp* imports	+	+		–
Total *ltp* imports	–	+		+ / –
PTA member *htp* imports	–		+	
PTA member *mhtp* imports	+	+		–
PTA member *mltp* imports	–			–
PTA member *ltp* imports	+	+ / –	+	+ / –
Growth				
GDP growth	+ / –	+ / –	+	+ / –
GDPpc growth	+ / –	+ / –	+ / –	+ / –
GDP growth rate	+	+	+	+
GDPpc growth rate	–			+ / –

Sometimes the results according to the development levels mirror the results found for the entire dataset, but *Table 106* shows that there is sufficient evidence to support previous research calling for a differentiated analysis. Future research on the effect of IPRs should consider the development level of countries to be an additional level towards understanding the mechanisms behind IPRs.

Concluding, the design of IPRs in PTAs has a significant economic effect, yet this effect is predominately negative for stringent IPR provisions or at least ambiguous.

5.2.5 Economic Effects: Conclusion

The analysis of the economic effects tested the postulated positive impact of IPRs on economic factors based on the rationale of IPRs and the rationale of IPRs in PTAs. Besides the positive effects accredited to IPRs, some argue that the level of IPR protection has its limits, whereby after a certain point, the positive effects become negative. Thereby, TRIPS functions either as a maximum standard and any additional stringent IPR regulation is counterproductive, or TRIPS is considered to be a minimum standard, and IPRs need TRIPS-plus protection to unfold their positive effects.

However, the regression analysis finds that most of the IPR design features in PTAs have a negative effect on the economic factors and not a positive one. Thereby, it is not only those provisions going beyond TRIPS commitments but also specific IPR provisions, which drive the negative direction of the effects. At least, some factors are positively affected by general IPR commitments in PTAs.

These results make it necessary to critically reflect on the rationale of IPRs in PTAs and reconsider it. It might even be necessary the revise the rational of IPRs, yet beforehand, one should run similar regression analyses for the economic effects of domestic IPR regulations. Moreover, countries should reconsider the option of including TRIPS-plus commitments in PTAs. If the economic effects of TRIPS-plus provisions in PTAs are predominately negative, then PTAs might not be the ideal forum for these commitments. The TRIPS-plus provisions in PTAs set an alternative and more stringent standard than the most common denominator (TRIPS) and alter the international IPR regulation due to the MFN character of IPRs in PTAs. Without clear positive effects, the trade-offs gained in PTA negotiations need to be substantial or it should be refrained from including TRIPS-plus in PTAs. Of course, the effects might change if there was a uniform TRIPS-plus standard and not multiple diverging, interest-driven forms of TRIPS-plus regulations.

My analysis has also shown that the level of development of countries should always be considered for the analysis of the effects of IPRs in PTAs. As stated in a report by the United Nations, *"it is unlikely that an increase in the levels of IPR protection will encourage foreign firms to expand their R&D activities in developing countries, unless other conditions (availability of highly qualified personnel, good and inexpensive re-*

search infrastructure, etc.) are met." (United Nations Conference on Trade and Development (UNCTAD) 2010, 18). It is necessary to also take into account the domestic frameworks, which could be commenced by country- or region-specific case studies.

Further research on the effect of IPRs in PTAs should also control for the economic rationale of PTAs (see *2.2.1.1 Rationale of PTAs*). For example in the form of a case study, one could focus on a single country and test if IPRs in PTAs lead to an observable trade creation or trade diversion effect. My study already shows some positive effects for both trade creation looking at the significant positive effects of the total IPR imports as well as indications for a preference of PTA members through the positive effects for PTA members imports. An in-depth study could analyse these effects appropriately.

Moreover, it might be interesting to focus more on a particular form of IPRs in PTAs and select more tailor-made factors for the effect analysis. For example, one could focus on patents and analyse the effects on the pharmaceutical industry.

There should also be an effort by researchers to gather more reliable data on the dependent variables, i.e. those factors supposedly affected by IPR. For example, the number of observations for the data on technology transfer is notoriously low. With technology transfer being one of the key factors for countries to optimise their production process and development level, it is necessary to gather more information on how technology transfer is affected by IPRs as well as IPRs in PTAs (see United Nations Conference on Trade and Development (UNCTAD) 2010, 19).

Concluding, there is a need for further analysis of IPRs in PTAs, ideally in connection with more domestic data on both IPRs, the IPR environment and economic factors.

Chapter 6: Overarching Summary and Conclusion

To conclude my thesis, the following subchapters first summarises and discusses the findings for the three research questions on what is the state of play (dataset), what can explain the status quo (design) and if it matters (effects). Afterwards, I describe the implications of my research and highlight pathways for future studies.

6.1 Summary and Discussion

There has been a vast amount of research on trade agreements as well as intellectual property rights. This monography adds to this previous research by reflecting the existing theories and creating a comprehensive and extensive **dataset on IPRs in PTAs** to test said theories. The dataset allows shedding light on the development and current state of the design of IPRs in PTAs. For instance, it shows that IPRs in PTAs have become far more common than generally assumed and that 80% of PTAs signed after 2010 include specific IPR provisions resp. 68% contain TRIPS-plus provisions. Furthermore, there are not only PTAs with the US, EU, EFTA and Japan, which cover stringent IPR provisions, but also other countries agree on such commitments amongst each other. The analysis of the development of IPRs in PTAs and their effects has thus growing global importance. The dataset also illustrates that there is immense variation in the design, for instance, in regard to the IPR forms covered. Moreover, the descriptive statistics show that these differences also diverge amongst like-minded groups such as the classic IP leaders, suggesting that countries specific preferences impact the design of IPRs in PTAs.

Therefore, I firstly analyse how the **design of IPRs in PTAs** can be explained. This design analysis shows that out of the theoretically derived impact factors, the design of IPRs in PTAs can be mostly explained by economic power asymmetries and domestic interests. The other factors, namely political pressure, veto players, endogeneity, regime preference and path dependency, also affect the design but less distinctively. These results suggest that countries decide on the design of IPR provisions in their PTAs either according to economic pressure and or follow their domestic interests. There is no statistical evidence that countries act according to the rationale of IPRs if it does not align with their domestic interest or if they are subjected to or assert economic power.

Further, I test in the **effect analysis** if the design of IPRs in PTAs matters, i.e. if the effects vary depending on the IPR content of PTAs. For this purpose, I apply two forms of analysis: the legal-institutional and economic effect analysis.

For the ***legal-institutional analysis***, I focus on the commitments toward IPR multilateral agreement in PTAs. Ideally, I would also test the legal effect, but as there is no comprehensive data on domestic IPR regulation, there is no way of testing if PTAs alter domestic IPR regulation or are merely reaffirming the status quo. However, there is information on the ratification of IPR multilateral agreements, which are often included as accession or reaffirmation commitments in PTAs. The legal-institutional analysis tests these commitments and compares the status pre and post PTAs. It shows, that most countries comply with the commitments made on IPR multilateral agreement made in PTAs but that most of these commitments are factually repeating the status quo, i.e. are commitments to already ratified multilateral agreements and do not require a change in the status quo. Moreover, the analysis shows that the more precise and legally binding provision have a stronger effect. They lead to a higher rate of compliance and effectiveness. The analysis of the legal-institutional effects thus shows, that that the design of the IPR commitments matters and impacts the intended factors.

The ***economic effect analysis*** tests if the design of IPRs finds statistical evidence for the effects ascribed to IPRs by the rationale of IPRs. More precisely, I look at the effect of general, specific and TRIPS-plus provisions on investment in R&D, FDI and licensing, innovation, technology transfer and growth. The regression analysis finds that some, yet not all of these factors are significantly affected by the design of IPRs in PTAs. Moreover, the analysis shows that especially the stringent IPR commitments in PTAs have a negative effect on these factors and not a positive one, as suggested by the rationale of IPR. The results indicate that the rationale for IPRs as well as the rationale of IPRs in PTAs calling for an increased IPR protection beyond TRIPS have to be critically revisited. Furthermore, the economic effect analysis illustrates that both the effect of the design of IPRs in PTAS varies according to a countries' development level. Future research should bear in mind that some effects might only be visible for particular income levels.

6.2 Implications and Pathways for Future Research

The importance of my analysis lies not only in the academic development of theoretically founded arguments, but should also serve for policymakers as grounds for negotiations. Recent developments indicate that PTAs will continue to include more stringent IPR provisions. For example, recently signed agreements between Switzerland and Indonesia (2018) as well as the two EU PTAs with Vietnam resp. Mercosur (2019) include stringent IPR provisions and even TRIPS-plus provisions. Countries should be aware of the non-preferential character of IPRs included in PTAs, and that there is an in-balance between received preferential trade-offs and MFN IPR commitments. Especially regarding those IPR provisions going beyond TRIPS, which are not reflecting a harmonised international standard and mostly further very particular interests. After all, my analysis shows that most stringent IPR provisions come with negative economic effects.

In the future, my dataset on IPRs in PTAs should be updated periodically with the latest agreements, which might even include new developments on the IPR front. The already existing data can be used in a multitude of ways. On the one hand, policymakers can use it to gain information about their home country or the PTA commitments of other countries. The data and analysis can thus assist policymakers in making informed decisions with trading partners. On the other hand, my dataset and analysis provide academia with an alternative approach on how to capture and measure PTA design, as well as a novel approach to evaluate PTA design and its effects. Other researchers and institutions can use my data to make in-depth analyses of the IPR design or IPR effects focusing on countries or regions.

Moreover, my dataset could be extended by a more precise legal coding of the IPR provisions, for example, for the specific IPR provisions. Hereby, one could differentiate the specific IPR provisions according to their legal bindingness or analyse the novelty of the commitments. For the latter, one could perform a text-as-data analysis and check how much of the IPR design is copied from already existing IPR multilateral agreements.

Additional, my analysis could be extended by using additional data on the non-PTA variables. For example, the data on technology transfer is scarce, and with an improved dataset, the economic effect analysis might yield more reliable results for technology transfer. The design, as well as the effect analysis, could also be tested using firm-level data, which could represent the domestic interest, power asymmetries as well as the economic effects.

Besides adding to my data and analysis, it would be useful to create a mirroring dataset for the state of domestic IPR regulation that goes beyond patents, trademarks and copyrights. Such a comprehensive dataset could be used to test the rationale of IPRs and the legal effects of IPRs in PTAs. Such data will be relevant to see on the one hand to what degree countries agree to new commitments in PTAs or if the reinforce mostly their domestic legislation. On the other hand, such data could give answers to the compliance of countries with their PTA commitments on IPRs.

Further, it would be interesting to have an IPR dataset containing information on the other fora of IPR regulation such as BITs or state agreements on IPRs. Even though they tend to be either less common or include fewer IPR provisions, their information would be useful for a comprehensive, informed picture on IPR regulation. For example, the state agreement on geographical indications between the Czech Republic and Switzerland signed in 1976 still prevents beer to be labelled as “Pils” in Switzerland if it does not originate from the Czech Republic (see Die Schweizerische Eidgenossenschaft 1976). More information on such agreements could help understand countries’ interest and show the development more comprehensively.

From a legal perspective, it would be interesting to analyse the lawsuits based on the infringement of IPRs in PTAs, for example, regarding the issuance of compulsory licenses, exhaustion measures or IPRs defined as investment. Further, legal scholars can use the T+PTA dataset I created in collaboration with Morin (2019) either for qualitative analysis by helping them identify countries with TRIPS-plus provisions in their PTAs or for quantitative analysis by comparing it to the domestic TRIPS-plus regulation data by Gold et al. (2019).

Finally, future research should also consider the effects of IPRs in PTAs on society. This can be the general costs of IPRs such as higher prices due to patent protection, or more specific factors such as the expenses paid by society for investor-state dispute settlements based on IPR commitments made in PTAs, or the effects of parallel importation (exhaustion regimes) for example in regards to health expenses.

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Appendixes

Appendix 1: List of PTAs per Country

Country	ISO Code	Number of PTAs 724	698
AFGHANISTAN	4	**3**	**2**
ALBANIA	8	**12**	**12**
ALGERIA	12	**12**	**12**
ANDORRA	20	**1**	**1**
ANGOLA	24	**8**	**8**
ANTIGUA AND BARBUDA	28	**17**	**17**
ARGENTINA	32	**37**	**36**
ARMENIA	51	**14**	**14**
AUSTRALIA	36	**21**	**20**
AUSTRIA	40	**69**	**60**
AZERBAIJAN	31	**7**	**6**
BAHAMAS	44	**14**	**14**
BAHRAIN	48	**9**	**9**
BANGLADESH	50	**7**	**6**
BARBADOS	52	**17**	**17**
BELARUS	112	**8**	**8**
BELGIUM	56	**114**	**105**
BELIZE	84	**14**	**14**
BENIN	204	**13**	**13**
BHUTAN	64	**4**	**4**
BOLIVIA	68	**12**	**12**
BOSNIA AND HERZEGOVINA	70	**12**	**12**
BOTSWANA	72	**15**	**15**
BRAZIL	76	**30**	**30**
BRUNEI DARUSSALAM	96	**14**	**14**
BULGARIA	100	**47**	**39**
BURKINA FASO	854	**15**	**15**
BURUNDI	108	**12**	**12**
CAMBODIA	116	**8**	**8**
CAMEROON	120	**16**	**15**
CANADA	124	**22**	**22**
CAPE VERDE	132	**8**	**8**
CENTRAL AFRICAN REPUBLIC	140	**15**	**15**
CHAD	148	**15**	**15**
CHILE	152	**42**	**41**
CHINA	156	**18**	**17**
COLOMBIA	170	**36**	**35**
COMOROS	174	**9**	**8**
CONGO, Democratic Republic of (was Zaire)	180	**13**	**13**
CONGO, Republic of (Brazzaville)	178	**15**	**15**
COOK ISLANDS	184	**4**	**4**
COSTA RICA	188	**24**	**24**
COTE D'IVOIRE	384	**15**	**15**
CROATIA	191	**26**	**24**
CUBA	192	**19**	**19**
CYPRUS	196	**33**	**24**
CZECH REPUBLIC	203	**46**	**37**
DENMARK	208	**101**	**92**
DJIBOUTI	262	**10**	**10**
DOMINICA	212	**17**	**17**
DOMINICAN REPUBLIC	214	**8**	**8**
ECUADOR	218	**18**	**18**
EGYPT	818	**22**	**22**

Country	ISO Code	Number of PTAs 724	698
EL SALVADOR	222	**23**	**23**
EQUATORIAL GUINEA	226	**10**	**10**
ERITREA	232	**2**	**2**
ESTONIA	233	**50**	**41**
ETHIOPIA	231	**9**	**9**
FAROE ISLANDS	234	**9**	**9**
FIJI	242	**9**	**8**
FINLAND	246	**76**	**67**
FRANCE	250	**115**	**106**
GABON	266	**15**	**15**
GAMBIA	270	**10**	**10**
GEORGIA	268	**12**	**12**
GERMANY	276	**114**	**105**
GHANA	288	**13**	**13**
GREECE	300	**78**	**69**
GRENADA	308	**18**	**18**
GUATEMALA	320	**26**	**26**
GUINEA	324	**11**	**11**
GUINEA-BISSAU	624	**9**	**9**
GUYANA	328	**20**	**20**
HAITI	332	**4**	**4**
HONDURAS	340	**22**	**22**
HONG KONG	344	**5**	**5**
HUNGARY	348	**45**	**36**
ICELAND	352	**44**	**43**
INDIA	356	**22**	**21**
INDONESIA	360	**15**	**14**
IRAN	364	**9**	**7**
IRAQ	368	**8**	**7**
IRELAND	372	**100**	**91**
ISRAEL	376	**20**	**20**
ITALY	380	**113**	**104**
JAMAICA	388	**16**	**16**
JAPAN	392	**17**	**17**
JORDAN	400	**37**	**37**
KAZAKHSTAN	398	**14**	**13**
KENYA	404	**13**	**13**
KIRIBATI	296	**7**	**7**
KOREA, Democratic People's Republic of (North Korea)	408	**1**	**1**
KOREA, Republic of (South Korea)	410	**21**	**21**
KOSOVO	900	**3**	**3**
KUWAIT	414	**10**	**10**
KYRGYZSTAN	417	**12**	**11**
LAO	418	**12**	**12**
LATVIA	428	**49**	**40**
LEBANON	422	**9**	**9**
LESOTHO	426	**16**	**16**
LIBERIA	430	**11**	**11**
LIBYA	434	**8**	**8**
LIECHTENSTEIN	438	**40**	**39**
LITHUANIA	440	**49**	**40**
LUXEMBOURG	442	**114**	**105**
MACAO	446	**2**	**2**
MADAGASCAR	450	**12**	**11**
MALAWI	454	**16**	**13**

Country	ISO Code	Number of PTAs 724	698
MALAYSIA	458	**22**	**22**
MALDIVES	462	**2**	**2**
MALI	466	**15**	**15**
MALTA	470	**32**	**23**
MARSHALL ISLANDS	584	**4**	**2**
MAURITANIA	478	**17**	**17**
MAURITIUS	480	**13**	**12**
MEXICO	484	**42**	**40**
MICRONESIA	583	**4**	**2**
MOLDOVA	498	**17**	**17**
MONACO	492	**1**	**1**
MONGOLIA	496	**1**	**1**
MONTENEGRO	499	**5**	**5**
MONTSERRAT	500	**11**	**11**
MOROCCO	504	**25**	**25**
MOZAMBIQUE	508	**12**	**12**
MYANMAR	104	**8**	**8**
NAMIBIA	516	**10**	**10**
NAURU	520	**3**	**3**
NEPAL	524	**4**	**4**
NETHERLANDS	528	**114**	**105**
NEW ZEALAND	554	**17**	**17**
NICARAGUA	558	**21**	**21**
NIGER	562	**14**	**14**
NIGERIA	566	**11**	**11**
NIUE	570	**4**	**4**
NORTH MACEDONIA	807	**13**	**13**
NORWAY	578	**47**	**46**
OMAN	512	**8**	**8**
PAKISTAN	586	**16**	**13**
PALAU	585	**3**	**2**
PALESTINIAN TERRITORY (West Bank and Gaza)	275	**9**	**6**
PANAMA	591	**25**	**25**
PAPUA NEW GUINEA	598	**9**	**8**
PARAGUAY	600	**21**	**21**
PERU	604	**35**	**34**
PHILIPPINES	608	**16**	**16**
POLAND	616	**44**	**35**
PORTUGAL	620	**79**	**69**
QATAR	634	**9**	**9**
ROMANIA	642	**44**	**36**
RUSSIAN FEDERATION	643	**14**	**14**
RWANDA	646	**13**	**13**
SAINT KITTS AND NEVIS	659	**16**	**16**
SAINT LUCIA	662	**17**	**17**
SAINT VINCENT AND THE GRENADINES	670	**16**	**16**
SAMOA	882	**8**	**8**
SAN MARINO	674	**1**	**1**
SAO TOME AND PRINCIPE	678	**7**	**7**
SAUDI ARABIA	682	**10**	**10**
SENEGAL	686	**15**	**15**
SERBIA	688	**16**	**16**
SEYCHELLES	690	**9**	**8**
SIERRA LEONE	694	**10**	**10**
SINGAPORE	702	**33**	**33**

Country	ISO Code	Number of PTAs	
		724	**698**
SLOVAKIA	703	**47**	**38**
SLOVENIA	705	**50**	**41**
SOLOMON ISLANDS	90	**7**	**7**
SOMALIA	706	**14**	**14**
SOUTH AFRICA	710	**12**	**11**
SOUTH SUDAN	728	**1**	**1**
SPAIN	724	**76**	**67**
SRI LANKA	144	**8**	**8**
SUDAN	736	**15**	**15**
SURINAME	740	**12**	**12**
SWAZILAND (ESWATINI)	748	**17**	**17**
SWEDEN	752	**72**	**63**
SWITZERLAND	756	**49**	**48**
SYRIAN ARAB REPUBLIC	760	**11**	**11**
TAIWAN	158	**7**	**6**
TAJIKISTAN	762	**7**	**6**
TANZANIA	834	**16**	**16**
THAILAND	764	**17**	**17**
TOGO	768	**13**	**13**
TONGA	776	**8**	**8**
TRINIDAD AND TOBAGO	780	**20**	**20**
TUNISIA	788	**18**	**18**
TURKEY	792	**41**	**38**
TURKMENISTAN	795	**5**	**4**
TUVALU	798	**7**	**7**
UGANDA	800	**13**	**13**
UKRAINE	804	**22**	**22**
UNITED ARAB EMIRATES	784	**12**	**12**
UNITED KINGDOM	826	**102**	**93**
UNITED STATES	840	**28**	**23**
URUGUAY	858	**32**	**32**
UZBEKISTAN	860	**6**	**5**
VANUATU	548	**6**	**6**
VENEZUELA	862	**27**	**27**
VIETNAM	704	**17**	**17**
WESTERN SAHARA	732	**2**	**2**
YEMEN	887	**3**	**3**
ZAMBIA	894	**14**	**10**
ZIMBABWE	716	**18**	**14**

Appendix 2: Codebook of IPRs in PTAs Dataset

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
A	PTA information	JS_ID	Identification number listing all coded PTAs. Numbers assigned from 1-724, sorted by date of signature, year of signature and alphabetical order.	Basis for PTA selection are the PTAs from DESTA (designoftradeagreements.org).	[1, 724]	724	698	basis
A	PTA information	DESTA_ID	DESTA identification number, including indication for accessions/withdrawals (+)	Based on DESTA version June2016. Those PTAs which were dropped from DESTA but already coded on their IPR content are coded as 'X' for this variable (#26 PTAs).	–	698	698	basis
A	PTA information	DESTA_ Base_Treaty	DESTA identification number	Based on DESTA version June2016. Those PTAs which were dropped from DESTA but already coded on their IPR content are coded as 'X' for this variable (#26 PTAs).	–	698	698	basis
A	PTA information	PTA	Name (Members) of PTA	Based on DESTA version June2016, eventually adjusted for clarification. Countries are listed in alphabetical order.	–	–	–	basis
A	PTA information	Members	Abbreviation of member countries (ISO 2-letter code)	Based on DESTA version June2016, eventually corrected	–	–	–	basis
A	PTA information	date_signature	Date of signature	Based on DESTA version June2016, eventually corrected	[06.12.48, 18.04.18]	–	–	basis
A	PTA information	year_signature	Year of signature	Based on DESTA version June2016, eventually corrected	[1948, 2018]	724	698	basis
A	PTA information	date_entry_into_force	Date of entry into force	Based on DESTA version June2016, eventually corrected	[01.04.49, 30.12.18]	–	–	basis
A	PTA information	year_entry_into_force	Year of entry into force	Based on DESTA version June2016, eventually corrected	[1949, 2018]	655	632	basis

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	**698**	
1	Index IPR general	ipr_gen-eral_sum	Sum of general IPR provisions	Sum of all general IPR provisions: - sum of general IPR variables (ipr_men-tioned, ipr_1_article, ipr_more_than_1_arti-cle, ipr_mfn, ipr_nt, ipr_as_investment, ipr_investment_mfn, ipr_investment_nt, ipr_assistance_coop_coordination) - sum of general enforcement variables (ipr_general_enforcement_sum) - sume of mentioned scope variables (ipr_scope_mentioned) Multilateral coherence variables are excluded.	[0, 24]	390	378	calculated
2	Index IPR general	ipr_gen-eral_ipr_dumm y	Based on sum: binary calculation of general IPR provisions	0: ipr_general_ipr_dummy = 0 1: ipr_general_ipr_dummy > 0	[0, 1]	390	378	calculated
3	Index IPR specific	ipr_spe-cific_sum	Sum of specific IPR provisions	Sum of all specific provisions - sum of specific enforcement variables (ipr_specific_enforcement_sum) - sum of tangible scope variables (ipr_scope_tangible) Multilateral coherence variables are excluded.	[0, 15]	165	159	calculated
4	Index IPR specific	ipr_spe-cific_ipr_dumm y	Based on sum: binary calculation of specific IPR provisions	0: ipr_specific_ipr_dummy = 0 1: ipr_specific_ipr_dummy > 0	[0, 1]	165	159	calculated
5	IPR general	ipr_mentioned	Does the treaty mention IPRs?	Not coded if only as exception (e.g. as standalone article excluding IPRs or exception regarding compulsory licenses within the in-vestment chapter)	[0, 1]	390	377	coded
6	IPR general	ipr_men-tioned_excep-tion	Are IPRs mentioned as general ex-ceptions in the agreement?	Codes if generally applicable (exceptions/res-ervation for intellectual property rights). Not coded if in a specific subchapter such as gov-ernment procurement.	[0, 1]	234	228	coded
7	IPR general	ipr_1_article	Is there an article specifically on IPRs?		[0, 1]	355	346	coded

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
8	IPR general	ipr_more_than_1_article	Are there more than one article specifically on IPRs?		[0, 1]	307	299	coded
9	IPR general	ipr_word_count	What is the word count on IPR articles, chapters and annexes?	This does only concern IPR specific parts of the treaty, as the IPR chapter, the IPR annex and the IPR joint declaration (including titles and footnotes). This does not concern the general exceptions, the preamble, the objectives, the investment, cooperation or dispute settlement standalone chapters or additional legal texts reaffirmed in the treaty (e.g. EC PTAs).	[0, 56242]	324	326	coded
10	IPR general	ipr_mfn	Is most-favoured-nation treatment granted in relation to IPRs (without considering investment chapters)?	This should be found directly in the IPR chapter/article/paragraph	[0, 1]	104	103	coded
11	IPR general	ipr_nt	Is national treatment (NT) granted in relation to IPRs (without considering investment chapters)?	This should be found directly in the IPR chapter/article/paragraph	[0, 1]	101	100	coded
12	IPR general dummy	ipr_mfn_nt_dummy	Are national and/or most-favoured-nation treatment granted in relation to IPRs without considering investment chapters?	Sum of ipr_mfn and ipr_nt: 0: ipr_mfn = '0' AND ipr_nt = '0' 1: ipr_mfn = '1' AND/OR ipr_nt = '1'	[0, 1]	143	142	calculated
13	IPR general	ipr_as_investment	Are IPRs defined as investment?	This should be found in the investment chapter	[0, 1]	96	94	coded
14	IPR general	ipr_investment_mfn	If IPR defined as investment: Is most-favoured-nation treatment granted in relation to IPRs in investment chapters?	If IPR is defined as investment and the investment chapter/article/paragraph grants MFN treatment	[0, 1]	86	84	coded
15	IPR general	ipr_investment_nt	If IPR defined as investment: Is national treatment granted in relation to IPRs in investment chapters?	If IPR is defined as investment and the investment chapter/article/paragraph grants national treatment	[0, 1]	92	91	coded

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	**698**	
16	IPR general dummy	ipr_comprehen-sive_mfn_nt_dummy	Are national and/or most-favoured-nation treatment granted in relation to IPRs?	Considering MFN and NT provisions of IPR and investment chapter: 0: ipr_mfn = '0' AND ipr_nt = '0' AND ipr_in-vestment_mfn = '0' AND ipr_investment_nt = '0' 1: ipr_mfn = '1' AND/OR ipr_nt = '1' AND/OR ipr_investment_mfn = '0' AND/OR ipr_investment_nt = '0'	[0, 1]	193	190	calculated
17	IPR general	ipr_assis-tance_coop_co-ordination	Is there assistance/cooperation/coor-dination agreed upon in relation to IPR?	This can be in a specific IPR provision, but also in a specific article on cooperation	[0, 1]	281	273	coded
18	IPR general	ipr_transi-tion_period	Is there a transition period agreed upon for accession to IPR provision (such as IPR agreements/conven-tions)?	Transition period is coded in years (calculated from signatory date)	[0, 13]	95	93	coded
19	Index IPR general enforcement	ipr_general_en-forcement_sum	Sum of all general IPR enforcement variables	Sum of all coded general IPR enforcement variables: ipr_general_enforcement ipr_dispute_settle-ment_mechanism ipr_investment_dispute_set-tlement_mechanism ipr_investment_expropri-ation_exception ipr_implementation ipr_border_measures	[0, 6]	301	294	calculated
20	Index IPR general enforcement	ipr_general_en-force-ment_dummy	Based on sum: binary calculation of general IPR enforcement provisions	0: ipr_general_enforcement = 0 1: ipr_general_enforcement > 0	[0, 1]	301	294	calculated
21	IPR general enforcement	ipr_general_en-forcement	Is there a general statement on IPRs enforcement?	Often these are very general statements on the enforcement of IPRs.	[0, 1]	257	253	coded

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
22	IPR general enforcement	ipr_dispute_settlement_mechanism	Is there an explicit dispute settlement mechanism directly related to IPRs (without considering investment chapters)?	In the IPR chapter or if IPR is specifically mentioned in the dipsute settlement chapter. Note: of course, there can also be general PTA dispute settlement mechanism, that cover IPR (if general and IPR is not excluded). Yet this variable only codes dispute settlement that explicitly refer to IPR. The variable ipr_excluded_from_dsm shows which PTAs explicitly exclude IPR from dispute settlement mechanisms.	[0, 1]	29	29	coded
23	IPR general enforcement	ipr_investment_dispute_settlement_mechanism	If IPR defined as investment: Is there an explicit dispute settlement mechanism?	If IPR is defined as investment and the investment chapter contains a dispute settlement mechanism	[0, 1]	88	86	coded
24	IPR general Enforcement dummy	ipr_comprehensive_dispute_settlement_mechanism_dummy	Is there a dispute settlement mechanism directly related to IPRs?	Considering both IPR and investment chapter: 0: ipr_dispute_settlement_mechanism = '0' AND ipr_investment_dispute_settlement_mechanism = '0' 1: ipr_dispute_settlement_mechanism = '1' AND/OR ipr_investment_dispute_settlement_mechanism = '1'	[0, 1]	99	97	calculated
25	IPR general enforcement	ipr_excluded_from_dsm	Is IPR explicitly excluded from the dispute settlement mechanism?	This can be found either within the IPR chapter or the general dispute settlement chapter of the PTA.	[0, 1]	5	5	coded
26	IPR general enforcement	ipr_investment_expropriation_exception	If IPR defined as investment: is there an exception for expropriation for compulsory licenses/intellectual property rights?	Some PTAs only include an expropriation exception in the investment chapter, but IPR is not defined as investment. This indicates that these provisions are most likely not included intentionally and are not coded.	[0, 1]	70	69	coded

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
27	IPR general enforcement dummy	ipr_investment_expropriation_implication	Conditional variable: If IPR defined as investment and compulsory licenses/IPRs are not namely exempted from expropriation. Meaning: IPR rights holder could challenge a issuance of compulsory license even in case of a national emergency as an act of investment expropriation	0: all other scenarios than '1' 1: if ipr_investment_nt = '1' and ipr_investment_expropriation_exception = '0'	[0, 1]	28	27	calculated
28	IPR general enforcement	ipr_implementation	Is there a general statement on IPRs implementation?	Often this are very general statements on the implementation of IPRs.	[0, 1]	105	101	coded
29	IPR general enforcement	ipr_border_measures	Is there a general statement on border measures related to IPRs?	Often this provisions can be found within the IPR chapter or articles on cross-border trade.	[0, 1]	125	124	coded
30	Index IPR specific enforcement	ipr_specific_enforcement_sum	Sum of specific statement on IPRs enforcement	This is an index of the specific enforcement variables: ipr_special_requirements_related_border_measures ipr_civil_administrative_procedures_remedies ipr_provisional_measure ipr_criminal_procedures_remedies ipr_service_provider_liability ipr_committee ipr_transparency	[0, 7]	139	137	calculated
31	Index IPR specific enforcement	ipr_specific_enforcement_dummy	Based on sum: binary calculation of specific IPR enforcement provisions	0: ipr_specific_enforcement_sum = 0 1: ipr_specific_enforcement_sum > 0	[0, 1]	139	137	calculated

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
32	IPR specific enforcement	ipr_special_requirements_related_border_measures	Are there special requirements related to border measures for the enforcement of IPRs?	- suspension of release of suspected counterfeit or confusingly similar trademark goods, or pirated copyright goods - prima facie an infringement of the right holder's intellectual property right - requirement of information - authorities have authority to require security from right holder - authority inform the right holder in case of infringement about consignor, importer, consignee and quantity - authority can initiate border measures ex officio without formal complaint - suspended, counterfeit goods are destroyed, never exported/imported - reasonable fee for border measures e.g. EFTA treaties "Suspension of Release by Competent Authorities" / "Right of Inspection" - technical advise and cooperation on border measures	[0, 1]	107	107	coded

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
33	IPR specific enforcement	ipr_civil_administrative_procedures_remedies	Are there any civil and administrative procedures and remedies defined for the enforcement of IPRs?	in civil judicial proceedings: judicial authorities have authority - to order the infringer to pay the right holder (pre-established or additional (repayment of profits) damages, court costs) seizure of counterfeits/ documentary evidence of infringement destruction of infringed goods at right holders request destruction of all goods related to the production of the counterfeit infringer to provide information on accomplices - to fine and imprison infringers, impose sanctions, award provisional measures and damages - to enjoin a party to a civil judicial proceeding from the exportation of goods that are alleged to infringe IPR	[0, 1]	96	96	coded
34	IPR specific enforcement	ipr_provisional_measure	Are there any provisional measures defined for the enforcement of IPRs?	- authorities shall act on requests for relief inaudita altera parte expeditiously - judicial authorities have authority to require applicant to provide evidence to make sure applicant's right is being infringed and to order applicant to provide reasonable security - for grant of provisional measures each Party shall provide for a rebuttable presumption of valid patent	[0, 1]	88	88	coded

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
35	IPR specific enforcement	ipr_criminal_procedures_remedies	Are there any criminal procedures and remedies defined for the enforcement of IPRs?	- criminal procedures and penalties for willful counterfeiting/piracy on a commercial scale (penalties include imprisonment, monetary fines) - judicial authorities shall have authority to order seizure of suspected counterfeit or pirated goods - judicial authorities shall have authority to order the forfeiture of assets traceable to the infringing activity and shall order the forfeiture and destruction of all goods found to be counterfeit or pirated - authorities have the authority to initiate criminal legal action ex officio without the need for a formal complaint by a private party or right holder. - criminal procedures and penalties for the knowing transport, transfer, in the course of trade or the making or obtaining control of, with intent to so transport, transfer, or otherwise dispose of, to another for anything of value, either false or counterfeit labels affixed or designed to be affixed to phonograms, copy of a computer program or documentation, packaging for a computer program, copy of a motion picture or other audiovisual work, counterfeit documentation or packaging for a computer program where the documentation or packaging has been made or obtained without the authorisation of the right holder	[0, 1]	91	91	coded

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
36	IPR specific enforcement	ipr_service_provider_liability	Is there a service provider liability defined for the enforcement of IPRs?	Expeditious remedies to prevent infringements and criminal and civil remedies - legal incentives for service providers to cooperate with copyright owners in deterring the unauthorised storage and transmission of copyrighted material - limitations preclude monetary relief and should provide restrictions on court-ordered relief to compel or restrain e.g. transmitting and routing	[0, 1]	29	29	coded
37	IPR specific enforcement	ipr_committee	Is there an IPR Committee monitoring implementation/enforcement/administration of IPRs?	If the Committee had only a consulting function it was coded as 0.	[0, 1]	55	54	coded
38	IPR specific enforcement	ipr_transparency	Is there a statement on transparency defined to ensure the enforcement of IPR protection?	E.g. decisions on IPR (infringements) are publicly available in at least the national language or in the English language.	[0, 1]	56	55	coded
39	Index IPR enforcement	ipr_enforcement_sum	Level of general and specific enforcement	Sum of all general and specific IPR enforcement provisions: ipr_general_enforcement_sum + ipr_specific_enforcement_sum	[0, 11]	305	298	calculated
40	Index IPR enforcement	ipr_enforcement_cat	Degree of general and specific enforcement	0: no IPR in PTA 1: general enforcement 2: specific enforcement (can also include general enforcement)	[0, 2]	305	298	calculated
41	IPR scope mentioned	ipr_m_copyrights_related_rights	Does the IPR definition/chapter mention copyrights and/or related rights?	This doesn't code provisions where copyright is only mentioned in a subparagraph as an exception (often introduced by "nothing in this chapter...").	[0, 1]	264	261	coded
42	IPR scope mentioned	ipr_m_trademarks	Does the IPR definition/chapter mention trademarks?		[0, 1]	259	255	coded
43	IPR scope mentioned	ipr_m_geo_indications	Does the IPR definition/chapter mention geographical indications?		[0, 1]	255	251	coded

ID	Category	Variable	Description	Note	Range	Occurrence 724	698	Mode
44	IPR scope mentioned	ipr_m_industrial_designs	Does the IPR definition/chapter mention industrial design?		[0, 1]	219	215	coded
45	IPR scope mentioned	ipr_m_patents	Does the IPR definition/chapter mention patents?		[0, 1]	248	241	coded
46	IPR scope mentioned	ipr_m_undisclosed_information	Does the IPR definition/chapter mention undisclosed information (including knowhow)?	Also called confidential information.	[0, 1]	212	209	coded
47	IPR scope mentioned	ipr_m_layout_design_integ_circuits	Does the IPR definition/chapter mention layout-designs (topographies) of integrated circuits?	Design of semiconductor product also referred to as topographies. integrated circuit: electronic circuit with elements integrated into a medium/semiconductor (such as silicon) Example: silicon chips for electronic equipment (e.g. SIM cards)	[0, 1]	205	199	coded
48	IPR scope mentioned	ipr_m_new_plant_varieties	Does the IPR definition/chapter mention new plant varieties?	Also called plant breeders' rights.	[0, 1]	112	110	coded
49	IPR scope mentioned	ipr_m_trad_knowledge_genetic_resources	Does the IPR definition/chapter mention traditional knowledge and/or genetic resources?	This can also in a different chapter (e.g. environment), yet usually is regulated directly in the IPR chapter.	[0, 1]	43	43	coded
50	IPR scope mentioned	ipr_m_encrypted_program_carrying_satellite_signals	Does the IPR definition/chapter mention encrypted program-carrying satellite signals?	This is not the same as broadcasting via satellites (which is often mentioned in connection to copyrights).	[0, 1]	34	34	coded
51	IPR scope mentioned	ipr_m_domain_names	Does the IPR definition/chapter mention domain names?		[0, 1]	19	19	coded
52	IPR scope tangible	ipr_t_copyrights_related_rights	Does the IPR definition/chapter include tangible commitments on copyrights and/or related rights?		[0, 1]	84	84	coded

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	**698**	
53	IPR scope tangible	ipr_t_trademarks	Does the IPR definition/chapter include tangible commitments on trademarks?		[0, 1]	92	91	coded
54	IPR scope tangible	ipr_t_geo_indications	Does the IPR definition/chapter include tangible commitments on geographical indications?		[0, 1]	106	105	coded
55	IPR scope tangible	ipr_t_industrial_designs	Does the IPR definition/chapter include tangible commitments on industrial design?		[0, 1]	63	62	coded
56	IPR scope tangible	ipr_t_patents	Does the IPR definition/chapter include tangible commitments on patents?		[0, 1]	84	80	coded
57	IPR scope tangible	ipr_t_undisclosed_information	Does the IPR definition/chapter include tangible commitments on undisclosed information (including knowhow)?		[0, 1]	48	48	coded
58	IPR scope tangible	ipr_t_layout_design_integ_circuits	Does the IPR definition/chapter include tangible commitments on layout-designs (topographies) of integrated circuits?		[0, 1]	11	8	coded
59	IPR scope tangible	ipr_t_new_plant_varieties	Does the IPR definition/chapter include tangible commitments on new plant varieties?		[0, 1]	16	15	coded
60	IPR scope tangible	ipr_t_trad_knowledge_genetic_resources	Does the IPR definition/chapter include tangible commitments on traditional knowledge and/or genetic resources?		[0, 1]	27	27	coded
61	IPR scope tangible	ipr_t_encrypted_program_carrying_satellite_signals	Does the IPR definition/chapter include tangible commitments on encrypted program-carrying satellite signals?		[0, 1]	28	28	coded

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
62	IPR scope tangible	ipr_t_domain_names	Does the IPR definition/chapter include tangible commitments on domain names?		[0, 1]	17	17	coded
63	Index IPR scope mentioned	ipr_scope_mentioned_sum	Sum of all mentioned IPRs	Sum(ipr_m_copyrights_related_rights:ipr_m_domain_names)	[0, 11]	297	291	calculated
64	Index IPR scope mentioned	ipr_scope_mentioned_dummy	Recoded variable ipr_scope_mentioned into binary variable	0: ipr_scope_mentioned = 0 1: ipr_scope_mentioned > 0	[0, 1]	297	291	calculated
65	Index IPR scope mentioned	ipr_scope_mentioned_trips	Does it mention the same IPRs as TRIPS?	TRIPS mentiones ipr_m_copyrights_related_rights-ipr_m_new_plant_varieties, so if all of those IPR areas are at least included in definition than coded as 1	[0, 1]	295	289	calculated
66	Index IPR scope mentioned	ipr_scope_mentioned_trips_extra	Are there any additional IPRs mentioned?	0: sum(ipr_m_trad_knowledge_genetic_resources-ipr_m_domain_names) = 0 1: sum(ipr_m_trad_knowledge_genetic_resources-ipr_m_domain_names) > 0	[0, 1]	76	76	calculated
67	Index IPR scope tangible	ipr_scope_tangible_sum	Sum of all tangible IPRs	Sum(ipr_t_copyrights_related_rights:ipr_t_domain_names)	[0, 11]	150	146	calculated
68	Index IPR scope tangible	ipr_scope_tangible_dummy	Recoded variable ipr_scope_tangible_ sum into binary variable	0: ipr_scope_tangible = 0 1: ipr_scope_tangible > 0	[0, 1]	150	146	calculated
69	Index IPR scope tangible	ipr_scope_tangible_trips	Same scope of tangible IPRs as TRIPS (coded as 1)	TRIPS includes tangible IPRs on ipr_t_copyrights_related_rights-ipr_t_layout_design_integ_circuits. TRIPS includes nothing tangible on plant varieties.	[0, 1]	150	146	calculated
70	Index IPR scope tangible	ipr_scope_tangible_trips_extra	Are there any additional tangible IPR provisions for other IPR areas?	0: sum(ipr_t_new_plant_varieties-ipr_t_domain_names)=0 1: sum(ipr_t_new_plant_varieties-ipr_t_domain_names)>0	[0, 1]	63	62	calculated

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	**698**	
71	Index IPR scope tangible	ipr_de-gree_of_protec-tion_cat	Degree of tangible IPR coverage	0: no tangible IPRs 1: only tangible IPR provisions on areas which are also covered by TRIPS 2: also tangible IPR provisions on areas not regulated by TRIPS	[0, 2]	150	146	calculated
72	Multilateral coherence	ipr_trips_1994	How does the treaty include the TRIPS agreement?	Trade-Related Aspects of Intellectual Property Rights. The TRIPS Agreement is Annex 1C of the Marrakesh Agreement Establishing the World Trade Organization (1994) **The level of regulation is coded categorically for all variables of the *multilateral coherence* category:** **0: not included** **1: reference** **2: reaffirmation of certain parts (Articles, Paragraphs)** **3: recommendation, e.g. make every possible effort (non-binding, non-commitment, intention) "will favourably consider acceding to", "express their attachment to observing the obligations flowing from the following multilateral conventions", "shall apply to accede"** **4: accession, e.g. shall accede/ratify, e.g. "shall undertake to obtain their adherence"** **5: reaffirmation & compliance, are already part of IPR treaty (e.g. 260_Croatia Moldova_2004: "The Contracting Parties confirm the importance they attach to the obligations arising from the following multilateral conventions")** **NA: PTA was signed before IPR treaty.**	[0, 5]	224	220	coded

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	**698**	
73	Multilateral coherence	ipr_doha_2001	How does the treaty include the Declaration on the TRIPS agreement and public health?	Declaration on the TRIPS agreement and public health (Adopted on 14 November 2001)	[0, 5]	55	55	coded
74	Multilateral coherence	ipr_wipo_1967	How does the treaty include the WIPO Convention?	Convention Establishing the World Intellectual Property Organisation (WIPO Convention, 1967,as amended 1979) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	160	160	coded
75	Multilateral coherence	ipr_rome_1961	How does the treaty include the Rome Convention?	International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations (1961) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	152	151	coded
76	Multilateral coherence	ipr_paris_1883	How does the treaty include the Paris Convention?	Paris Convention for the Protection of Industrial Property (as amended on September 28, 1979) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	206	204	coded
77	Multilateral coherence	ipr_bern_1886	How does the treaty include the Bern Convention?	Berne Convention for the Protection of Literary and Artistic Works (as amended on September 28, 1979) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	203	202	coded
78	Multilateral coherence	ipr_wipo_copyright_1996	How does the treaty include the WCT?	WIPO Copyright Treaty (WCT) (1996) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	104	103	coded
79	Multilateral coherence	ipr_wipo_phono_1996	How does the treaty include the WPPT?	WIPO Performances and Phonograms Treaty (WPPT) (1996) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	103	102	coded

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	**698**	
80	Multilateral coherence	ipr_phonograms_geneva_1971	How does the treaty include the Convention for the Protection of Producers of Phonograms Against Unauthorized Duplication of Their Phonograms?	Convention for the Protection of Producers of Phonograms Against Unauthorized Duplication of Their Phonograms (1971), Geneva Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	69	69	coded
81	Multilateral coherence	ipr_audiovisual_performances_beijing_2012	How does the treaty include the Beijing Treaty?	Beijing Treaty on Audiovisual Performances (2012) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	10	10	coded
82	Multilateral coherence	ipr_trademarks_singapore_2006	How does the treaty include the Singapore Treaty?	Singapore Treaty on the Law of Trademarks (2006) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	18	17	coded
83	Multilateral coherence	ipr_trademark_law_treaty_geneva_1994	How does the treaty include the TLT?	Trademark Law Treaty (TLT) (1994) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	45	44	coded
84	Multilateral coherence	ipr_patent_law_treaty_2000	How does the treaty include the PLT?	Patent Law Treaty (2000) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	34	33	coded
85	Multilateral coherence	ipr_prog_carr_signals_trans_satellite_brussels_1974	How does the treaty include the Brussels Convention?	Brussels Convention Relating to the Distribution of Programme-Carrying Signals Transmitted by Satellite (1974) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	33	33	coded
86	Multilateral coherence	ipr_olympic_symbol_nairobi_1981	How does the treaty include the Nairobi Treaty?	Nairobi Treaty on the Protection of the Olympic Symbol (1981) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	5	5	coded
87	Multilateral coherence	ipr_patents_budapest_1977	How does the treaty include the Budapest Treaty?	Budapest Treaty on the International Recognition of the Deposit of Micro-organisms for the Purposes of Patent Procedure (as amended on September 26, 1980)	[0, 5]	114	113	coded

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
				Note: if PTA signed before IPR treaty then set to NA.				
88	Multilateral coherence	ipr_industrial_design_hague_1925	How does the treaty include the Hague Agreement?	Hague Agreement Concerning the International Registration of Industrial Designs (1925) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	56	55	coded
89	Multilateral coherence	ipr_appellation_origin_lisbon_1958	How does the treaty include the Lisbon Agreement?	Lisbon Agreement for the Protection of Appellations of Origin and their International Registration (as amended on September 28, 1979) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	5	5	coded
90	Multilateral coherence	ipr_marks_madrid_1891	How does the treaty include the Madrid Agreement?	Madrid Agreement Concerning the International Registration of Marks (as amended on September 28, 1979) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	47	47	coded
91	Multilateral coherence	ipr_protocol_marks_madrid_1989	How does the treaty include the Protocol of the Madrid Agreement?	Protocol Relating to the Madrid Agreement Concerning the International Registration of Marks (as amended on November 12, 2007) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	109	108	coded
92	Multilateral coherence	ipr_patent_cooperation_treaty_1970	How does the treaty include the PCT?	Patent Cooperation Treaty (PCT) (1970) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	148	147	coded
93	Multilateral coherence	ipr_marks_nice_1957	How does the treaty include the Nice Agreement?	Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks (as amended on September 28, 1979) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	121	121	coded

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
94	Multilateral coherence	ipr_patent_classification_strasbourg_1971	How does the treaty include the Strasbourg Agreement?	Strasbourg Agreement Concerning the International Patent Classification (as amended on September 28, 1979) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	29	29	coded
95	Multilateral coherence	ipr_figurative_elements_marks_vienna_1973	How does the treaty include the Vienna Agreement?	Vienna Agreement Establishing an International Classification of the Figurative Elements of Marks (as amended on October 1, 1985) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	8	8	coded
96	Multilateral coherence	ipr_classifiaction_industrial_designs_locarno_1968	How does the treaty include the Locarno Agreement?	Locarno Agreement Establishing an International Classification for Industrial Designs (as amended on September 28, 1979) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	18	18	coded
97	Multilateral coherence	ipr_european_patent_connvention_1973	How does the treaty include the EPC?	European Patent Convention (1973) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	33	33	coded
98	Multilateral coherence	ipr_new_varieties_plants_upov_1961	How does the treaty include the UPOV?	International Convention for the Protection of New Varieties of Plants (UPOV) (1961) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	127	126	coded
99	Multilateral coherence	ipr_upov_1968	Does this treaty refer to the 1968 version of UPOV?	This is a more detailed coding of ipr_new_varieties_plants_upov_1961. In some cases there is a specific version of UPOV mentioned. This can have ramifications on the protection of plant varieties. Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	5	5	coded

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
100	Multilateral coherence	ipr_upov_1972	Does this treaty refer to the 1972 version of UPOV?	This is a more detailed coding of ipr_new_varieties_plants_upov_1961. In some cases there is a specific version of UPOV mentioned. This can have ramifications on the protection of plant varieties. Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	8	8	coded
101	Multilateral coherence	ipr_upov_1978	Does this treaty refer to the 1978 version of UPOV?	This is a more detailed coding of ipr_new_varieties_plants_upov_1961. In some cases there is a specific version of UPOV mentioned. This can have ramifications on the protection of plant varieties. Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	32	32	coded
102	Multilateral coherence	ipr_upov_1991	Does this treaty refer to the 1991 version of UPOV?	This is a more detailed coding of ipr_new_varieties_plants_upov_1961. In some cases there is a specific version of UPOV mentioned. This can have ramifications on the protection of plant varieties. Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	62	62	coded
103	Multilateral coherence	ipr_international_plant_protection_convention_1951	How does the treaty include the IPPC?	International Plant Protection Convention (1951). Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	102	102	coded
104	Multilateral coherence	ipr_cbd_biodiversity_1992	How does the treaty include the CBD?	Convention on Biological Diversity (CBD) (1992) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	80	80	coded

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
105	Multilateral coherence	ipr_universal_copyright_convention_geneva_1952	How does the treaty include the UCC (Geneva, 1952)?	Universal Copyright Convention of 6 September 1952, with Appendix Declaration relating to Article XVII and Resolution concerning Article XI, Geneva Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	43	43	coded
106	Multilateral coherence	ipr_universal_copyright_convention_paris_1971	How does the treaty include the UCC (Paris, 1971)?	Universal Copyright Convention as revised on 24 July 1971, with Appendix Declaration relating to Article XVII and Resolution concerning Article XI, Paris Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	24	24	coded
107	Multilateral coherence	ipr_uniform_domain_name_res_udrp_1991	How does the treaty include the UDRP?	Uniform Domain Name Dispute Resolution Policy (1999) Note: if PTA signed before IPR treaty then set to NA.	[0, 5]	17	17	coded
108	Multilateral coherence	ipr_convention_deadline	Is there a deadline to accede/implement to those treaties?	Indicates transitional flexibility, weaker commitment Code the number of years.	[0, 13]	97	96	coded
109	Multilateral coherence	ipr_both_parties	Does the treaty mention (generally) binding multilateral agreements to which both are party?	i.e. "The Parties reaffirm their existing rights and obligations with respect to multilateral intellectual property agreements to which both are party."	[0, 1]	86	86	coded
110	Multilateral coherence dummy	ipr_trips_1994_dummy	Does the treaty include the TRIPS agreement?	0: ipr_trips_1994 = 0 1: ipr_trips_1994 > 0	[0, 1]	224	220	calculated
111	Multilateral coherence dummy	ipr_doha_2001_dummy	Does the treaty include the Declaration on the TRIPS agreement and public health?	0: ipr_doha_2001 = 0 1: ipr_doha_2001 > 0	[0, 1]	55	55	calculated
112	Multilateral coherence dummy	ipr_wipo_1967_dummy	Does the treaty include the WIPO Convention?	0: ipr_wipo_1967 = 0 1: ipr_wipo_1967 > 0	[0, 1]	160	160	calculated
113	Multilateral coherence dummy	ipr_rome_1961_dummy	Does the treaty include the Rome Convention?	0: ipr_rome_1961 = 0 1: ipr_rome_1961 > 0	[0, 1]	152	151	calculated

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
114	Multilateral coherence dummy	ipr_paris_1883_dummy	Does the treaty include the Paris Convention?	0: ipr_paris_1883 = 0 1: ipr_paris_1883 > 0	[0, 1]	206	204	calculated
115	Multilateral coherence dummy	ipr_bern_1886_dummy	Does the treaty include the Bern Convention?	0: ipr_bern_1886 = 0 1: ipr_bern_1886 > 0	[0, 1]	203	202	calculated
116	Multilateral coherence dummy	ipr_wipo_copyright_1996_dummy	Does the treaty include the WCT?	0: ipr_wipo_copyright_1996 = 0 1: ipr_wipo_copyright_1996 > 0	[0, 1]	104	103	calculated
117	Multilateral coherence dummy	ipr_wipo_phono_1996_dummy	Does the treaty include the WPPT?	0: ipr_wipo_phono_1996 = 0 1: ipr_wipo_phono_1996 > 0	[0, 1]	103	102	calculated
118	Multilateral coherence dummy	ipr_phonograms_geneva_1971_dummy	Does the treaty include the Convention for the Protection of Producers of Phonograms Against Unauthorized Duplication of Their Phonograms?	0: ipr_phonograms_geneva_1971 = 0 1: ipr_phonograms_geneva_1971 > 0	[0, 1]	69	69	calculated
119	Multilateral coherence dummy	ipr_audiovisual_performances_beijing_2012_dummy	Does the treaty include the Beijing Treaty?	0: ipr_audiovisual_performances_beijing_2012 = 0 1: ipr_audiovisual_performances_beijing_2012 > 0	[0, 1]	10	10	calculated
120	Multilateral coherence dummy	ipr_trademarks_singapore_2006_dummy	Does the treaty include the Singapore Treaty?	0: ipr_trademarks_singapore_2006 = 0 1: ipr_trademarks_singapore_2006 > 0	[0, 1]	18	17	calculated
121	Multilateral coherence dummy	ipr_trademark_law_treaty_geneva_1994_dummy	Does the treaty include the TLT?	0: ipr_trademark_law_treaty_geneva_1994 = 0 1: ipr_trademark_law_treaty_geneva_1994 > 0	[0, 1]	45	44	calculated
122	Multilateral coherence dummy	ipr_patent_law_treaty_2000_dummy	Does the treaty include the PLT?	0: ipr_patent_law_treaty_2000 = 0 1: ipr_patent_law_treaty_2000 > 0	[0, 1]	34	33	calculated

ID	Category	Variable	Description	Note	Range	Occurrence 724	Occurrence 698	Mode
123	Multilateral coherence dummy	ipr_prog_carr_signals_trans_satellite_brussels_1974_dummy	Does the treaty include the Brussels Convention?	0: ipr_prog_carr_signals_trans_satellite_brussels_1974 = 0 1: ipr_prog_carr_signals_trans_satellite_brussels_1974 > 0	[0, 1]	33	33	calculated
124	Multilateral coherence dummy	ipr_olympic_symbol_nairobi_1981_dummy	Does the treaty include the Nairobi Treaty?	0: ipr_olympic_symbol_nairobi_1981 = 0 1: ipr_olympic_symbol_nairobi_1981 > 0	[0, 1]	5	5	calculated
125	Multilateral coherence dummy	ipr_patents_budapest_1977_dummy	Does the treaty include the Budapest Treaty?	0: ipr_patents_budapest_1977 = 0 1: ipr_patents_budapest_1977 > 0	[0, 1]	114	113	calculated
126	Multilateral coherence dummy	ipr_industrial_design_hague_1925_dummy	Does the treaty include the Hague Agreement?	0: ipr_industrial_design_hague_1925 = 0 1: ipr_industrial_design_hague_1925 > 0	[0, 1]	56	55	calculated
127	Multilateral coherence dummy	ipr_appellation_origin_lisbon_1958_dummy	Does the treaty include the Lisbon Agreement?	0: ipr_appellation_origin_lisbon_1958 = 0 1: ipr_appellation_origin_lisbon_1958 > 0	[0, 1]	5	5	calculated
128	Multilateral coherence dummy	ipr_marks_madrid_1891_dummy	Does the treaty include the Madrid Agreement?	0: ipr_marks_madrid_1891 = 0 1: ipr_marks_madrid_1891 > 0	[0, 1]	47	47	calculated
129	Multilateral coherence dummy	ipr_protocol_marks_madrid_1989_dummy	Does the treaty include the Protocol of the Madrid Agreement?	0: ipr_protocol_marks_madrid_1989 = 0 1: ipr_protocol_marks_madrid_1989 > 0	[0, 1]	109	108	calculated
130	Multilateral coherence dummy	ipr_patent_cooperation_treaty_1970_dummy	Does the treaty include the PCT?	0: ipr_patent_cooperation_treaty_1970 = 0 1: ipr_patent_cooperation_treaty_1970 > 0	[0, 1]	148	147	calculated

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
131	Multilateral coherence dummy	ipr_marks_nice_1957_dummy	Does the treaty include the Nice Agreement?	0: ipr_marks_nice_1957 = 0 1: ipr_marks_nice_1957 > 0	[0, 1]	121	121	calculated
132	Multilateral coherence dummy	ipr_patent_classification_strasbourg_1971_dummy	Does the treaty include the Strasbourg Agreement?	0: ipr_patent_classification_strasbourg_1971 = 0 1: ipr_patent_classification_strasbourg_1971 > 0	[0, 1]	29	29	calculated
133	Multilateral coherence dummy	ipr_figurative_elements_marks_vienna_1973_dummy	Does the treaty include the Vienna Agreement?	0: ipr_figurative_elements_marks_vienna_1973 = 0 1: ipr_figurative_elements_marks_vienna_1973 > 0	[0, 1]	8	8	calculated
134	Multilateral coherence dummy	ipr_classifiaction_industrial_designs_locarno_1968_dummy	Does the treaty include the Locarno Agreement?	0: ipr_classifiaction_industrial_designs_locarno_1968 = 0 1: ipr_classifiaction_industrial_designs_locarno_1968 > 0	[0, 1]	18	18	calculated
135	Multilateral coherence dummy	ipr_european_patent_connvention_1973_dummy	Does the treaty include the EPC?	0: ipr_european_patent_connvention_1973 = 0 1: ipr_european_patent_connvention_1973 > 0	[0, 1]	33	33	calculated
136	Multilateral coherence dummy	ipr_new_varieties_plants_upov_1961_dummy	Does the treaty include the UPOV?	0: ipr_new_varieties_plants_upov_1961 = 0 1: ipr_new_varieties_plants_upov_1961 > 0	[0, 1]	127	126	calculated
137	Multilateral coherence dummy	ipr_upov_1968_dummy	Does this treaty refer to the 1968 version of UPOV?	0: ipr_upov_1968 = 0 1: ipr_upov_1968 > 0	[0, 1]	5	5	calculated
138	Multilateral coherence dummy	ipr_upov_1972_dummy	Does this treaty refer to the 1972 version of UPOV?	0: ipr_upov_1972 = 0 1: ipr_upov_1972 > 0	[0, 1]	8	8	calculated
139	Multilateral coherence dummy	ipr_upov_1978_dummy	Does this treaty refer to the 1978 version of UPOV?	0: ipr_upov_1978 = 0 1: ipr_upov_1978 > 0	[0, 1]	32	32	calculated

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
140	Multilateral coherence dummy	ipr_upov_1991_dummy	Does this treaty refer to the 1991 version of UPOV?	0: ipr_upov_1991 = 0 1: ipr_upov_1991 > 0	[0, 1]	62	62	calculated
141	Multilateral coherence dummy	ipr_international_plant_protection_convention_1951_dummy	Does the treaty include the IPPC?	0: ipr_international_plant_protection_convention_1951 = 0 1: ipr_international_plant_protection_convention_1951 > 0	[0, 1]	102	102	calculated
142	Multilateral coherence dummy	ipr_cbd_biodiversity_1992_dummy	Does the treaty include the CBD?	0: ipr_cbd_biodiversity_1992 = 0 1: ipr_cbd_biodiversity_1992 > 0	[0, 1]	80	80	calculated
143	Multilateral coherence dummy	ipr_universal_copyright_convention_geneva_1952_dummy	Does the treaty include the UCC (Geneva, 1952)?	0: ipr_universal_copyright_convention_geneva_1952 = 0 1: ipr_universal_copyright_convention_geneva_1952 > 0	[0, 1]	43	43	calculated
144	Multilateral coherence dummy	ipr_universal_copyright_convention_paris_1971_dummy	Does the treaty include the UCC (Paris, 1971)?	0: ipr_universal_copyright_convention_paris_1971 = 0 1: ipr_universal_copyright_convention_paris_1971 > 0	[0, 1]	24	24	calculated
145	Multilateral coherence dummy	ipr_uniform_domain_name_res_udrp_1991_dummy	Does the treaty include the UDRP??	0: ipr_uniform_domain_name_res_udrp_1991 = 0 1: ipr_uniform_domain_name_res_udrp_1991 > 0	[0, 1]	17	17	calculated
146	Index multilateral coherence	ipr_wipo_treaty_reference_dummy	Is there any reference to WIPO treaties regulating IPR?	TRIPS and WIPO establishing agreement are excluded: coded as '1' if any of the WIPO governed treaties are coded: 0: sum(ipr_rome_1961 : ipr_classifiaction_industrial_designs_locarno_1968) = 0 1: sum(ipr_rome_1961 : ipr_classifiaction_industrial_designs_locarno_1968) > 0	[0, 1]	215	213	calculated

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
147	Index multilateral coherence	ipr_multilateral_coherence_1	Level of WIPO and WTO embeddedness	NT/MFN treatment, TRIPS, WIPO reaffirmation, 1 or more WIPO treaties reaffirmed: ipr_mfn_nt_dummy+ipr_trips_1994_dummy+ ipr_wipo_1967_dummy+ipr_wipo_treaty_reference_dummy	[0, 4]	287	282	calculated
148	Index multilateral coherence	ipr_multilateral_coherence_1_NA	Number of NAs within level of WIPO and WTO embeddedness	This concerns TRIPS and WIPO reaffirmation which can be 'NA' if the PTA entered into force before TRIPS/WIPO/WIPO treaties	[0, 2]	251	244	calculated
149	Index multilateral coherence	ipr_multilateral_coherence_1_corr	Level of WIPO and WTO embeddedness, corrected by NAs	NT/MFN treatment, TRIPS, WIPO reaffirmation, 1 or more WIPO treaties reaffirmed: ipr_mfn_nt_dummy+ipr_trips_1994_dummy+ ipr_wipo_1967_dummy+ipr_wipo_treaty_reference_dummy with 'NA' removed from coherence measure	[0, 4]	287	282	calculated
150	Index multilateral coherence	ipr_multilateral_coherence_2	Level of treaty embeddedness	Number of IPR related treaties reaffirmed, excluding TRIPS, Doha, WIPO Organization and European Patent Convention: sum((ipr_rome_1961:ipr_classifiaction_industrial_designs_locarno_1968_dummy)+ipr_new_varieties_plants_upov_1961_dummy+sum(ipr_international_plant_protection_convention_1951_dummy:ipr_uniform_domain_name_res_udrp_1991_dummy)	[0, 22]	238	236	calculated
151	Index multilateral coherence	ipr_multilateral_coherence_2_cat	Level of treaty embeddedness, categorized	0: no multilateral coherence 1: 1-8 2: more than 8	[0, 2]	238	236	calculated
152	Index multilateral coherence	ipr_multilateral_coherence_bindingness_sum	Sum of all coded IPR multilateral provisions	Excluded are the four sub-variables for the referenced year of UPOV.	[0, 112]	311	306	calculated

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
153	Index multilateral coherence	ipr_multilat-eral_coher-ence_binding-ness_dummy	Based on sum: binary calculation of general IPR provisions	0: ipr_general_ipr_dummy = 0 1: ipr_general_ipr_dummy > 0	[0, 1]	311	306	calculated
154	Index multilateral coherence	ipr_multilat-eral_coher-ence_dummy_s um	Sum of all coded IPR multilateral provisions, count variable.	Accounts to the reference of any of the coded agreements regardless of their bindingness. Excluded are the four sub-variables for the referenced year of UPOV.	[0, 24]	311	306	calculated
155	Index multilateral coherence	ipr_multilat-eral_coher-ence_dummy_d ummy	Based on sum: binary calculation of general IPR provisions	0: ipr_general_ipr_dummy = 0 1: ipr_general_ipr_dummy > 0	[0, 1]	311	306	calculated
N	Notes	ipr_pta_com-ment	Is there anything special about this PTA/ a certain IPR variable within this PTA?					notes
N	Notes	ipr_arti-cle_m_annex	If the annex is missing in the treaty: Which article of the treaty mentions the missing annex?					notes
N	Notes	ipr_an-nex_name	If the annex is missing in the treaty: What is the name of this missing an-nex?					notes
N	Notes	ipr_directives	Does the PTA refer to directives al-tering the coding?	These was foremost the case for EU treaties. Coded, where they specifically referred to an IPR context.				notes
T+PTA	Index TRIPS-plus	ipr_trip-splus_per_pta	Sum of TRIPS+ IPR provisions per PTA	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 42]	137	136	calculated
T+PTA	Index TRIPS-plus	ipr_trip-splus_copy-rights_re-lated_rights	Sum of TRIPS+ IPR provisions on copyright	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 3]	59	59	calculated

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	**698**	
T+PTA	Index TRIPS-plus	ipr_tripsplus_trademarks	Sum of TRIPS+ IPR provisions on trademarks	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 5]	71	70	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_geo_indications	Sum of TRIPS+ IPR provisions on geographical indications	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 7]	91	90	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_industrial_design	Sum of TRIPS+ IPR provisions on industrial design	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	52	51	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_patents	Sum of TRIPS+ IPR provisions on patents	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 6]	53	52	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_undisclosed_information	Sum of TRIPS+ IPR provisions on undisclosed information	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 6]	46	46	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_layout_design	Sum of TRIPS+ IPR provisions on layout designs	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	3	3	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_new_plant_varieties	Sum of TRIPS+ IPR provisions on new plant varieties	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 2]	91	90	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_trad_knowledge_genetic_resources	Sum of TRIPS+ IPR provisions on traditional knowledge and genetic resources	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 7]	24	24	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_encrypted_program_carrying_satellite_signals	Sum of TRIPS+ IPR provisions on encrypted program-carrying satellite signals	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	29	29	calculated

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
T+PTA	Index TRIPS-plus	ipr_trip-splus_do-main_names	Sum of TRIPS+ IPR provisions on domain names	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	17	17	calculated
T+PTA	Index TRIPS-plus	ipr_trip-splus_enforce-ment	Sum of TRIPS+ IPR provisions on enforcement	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 21]	92	92	calculated
T+PTA	Index TRIPS-plus	ipr_trip-splus_exhaus-tion	Sum of TRIPS+ IPR provisions on exhaustion	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 6]	6	6	calculated
T+PTA	Index TRIPS-plus	ipr_trip-splus_per_pta_d ummy	Based on sum: binary calculation of TRIPS+ IPR provisions per PTA	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	137	136	calculated
T+PTA	Index TRIPS-plus	ipr_trip-splus_copy-rights_re-lated_rights_du mmy	Based on sum: binary calculation of TRIPS+ IPR provisions on copyright	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	59	59	calculated
T+PTA	Index TRIPS-plus	ipr_trip-splus_trade-marks_dummy	Based on sum: binary calculation of TRIPS+ IPR provisions on trade-marks	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	71	70	calculated
T+PTA	Index TRIPS-plus	ipr_trip-splus_geo_indi-cations_dummy	Based on sum: binary calculation of TRIPS+ IPR provisions on geograph-ical indications	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	91	90	calculated
T+PTA	Index TRIPS-plus	ipr_trip-splus_indus-trial_de-sign_dummy	Based on sum: binary calculation of TRIPS+ IPR provisions on industrial design	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	52	51	calculated
T+PTA	Index TRIPS-plus	ipr_trip-splus_pa-tents_dummy	Based on sum: binary calculation of TRIPS+ IPR provisions on patents	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	53	52	calculated

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
T+PTA	Index TRIPS-plus	ipr_tripsplus_undisclosed_information_dummy	Based on sum: binary calculation of TRIPS+ IPR provisions on undisclosed information	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	46	46	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_layout_design_dummy	Based on sum: binary calculation of TRIPS+ IPR provisions on layout designs	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	3	3	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_new_plant_varieties_dummy	Based on sum: binary calculation of TRIPS+ IPR provisions on new plant varieties	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	91	90	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_trad_knowledge_genetic_resources_dummy	Based on sum: binary calculation of TRIPS+ IPR provisions on traditional knowledge and genetic resources	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	24	24	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_encrypted_program_carrying_satellite_signals_dummy	Based on sum: binary calculation of TRIPS+ IPR provisions on encrypted program-carrying satellite signals	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	29	29	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_domain_names_dummy	Based on sum: binary calculation of TRIPS+ IPR provisions on domain names	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	17	17	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_enforcement_dummy	Based on sum: binary calculation of TRIPS+ IPR provisions on enforcement	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	92	92	calculated

ID	Category	Variable	Description	Note	Range	Occurrence		Mode
						724	698	
T+PTA	Index TRIPS-plus	ipr_tripsplus_exhaustion_dummy	Based on sum: binary calculation of TRIPS+ IPR provisions on exhaustion	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	6	6	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_subindex_patent	Subindex for all TRIPS-plus variables on patents, double weighed by number of variables and importance to index overall	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	53	52	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_subindex_copyright	Subindex for all TRIPS-plus variables on copyrights, double weighed by number of variables and importance to index overall	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	60	60	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_subindex_trademark	Subindex for all TRIPS-plus variables on trademarks, double weighed by number of variables and importance to index overall	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 1]	71	70	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_patent_enforcement_exhaustion_sum	Sum of all coded TRIPS-plus provisions on patent, including enforcement and exhaustion provisions for patents	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 10]	75	74	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_copyright_enforcement_exhaustion_sum	Sum of all coded TRIPS-plus provisions on copyright, including enforcement and exhaustion provisions for copyrights	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 11]	88	88	calculated
T+PTA	Index TRIPS-plus	ipr_tripsplus_trademark_enforcement_exhaustion_sum	Sum of all coded TRIPS-plus provisions on trademarks, including enforcement and exhaustion provisions for trademarks	This variable is based on the T+PTA dataset developed in collaboration with Jean-Frédéric Morin (available on DESTA homepage)	[0, 12]	96	95	calculated

Appendix 3: Codebook of T+PTA Dataset

ID	Category	Variable	Description	Note	Range	Occurrence 724	Occurrence 698	Mode	Origin
1	Copyright	copyright_ term_protection_70	Duration **70 years**: This variable codes the duration of protection of literary work in years of copyright beyond the death of the author(s).	Code if number of years of protection “after life” is 70 Note: code the "general rule": which ever applies to most categories of copyright.	[0, 1]	32	32	Coded	Gold (domestic TRIPS+): cd70
2	Copyright	copyright_ term_protection_90	Duration **90 years**: This variable codes the duration of protection of literary work in years of copyright beyond the death of the author(s).	Code if number of years of protection “after life” is 90 Note: code the "general rule": which ever applies to most categories of copyright.	[0, 1]	0	0	Coded	Gold (domestic TRIPS+): cd90
3	Copyright	copyright_ scope_videograms	Scope includes **videograms**: This variable codes if the scope for copyright protection includes videograms.	Code if videograms are covered in the copyright section of the PTA. Note: TRIPS only refers to cinematographic works.	[0, 1]	7	7	Coded	Surbeck
4	Copyright	copyright_ private_use_ exception_ specific	**Private use exceptions**: This variable codes the extent of to which a private use exception exists in copyright.	Code if exceptions include at least a <u>specified set of scenarios for users</u>. Note: If the private use exception is only related to anti-circumventive measures then it is not coded.	[0, 1]	4	4	Coded	Gold (domestic TRIPS+): cpue
5	Copyright	copyright_ scope_berne _6bis	Article **6bis of the Berne Convention** is included in the copyright section.	Code if the text of the Berne Convention Article 6bis is copied or highly similarly included in the copyright IPR section of the PTA. Note: TRIPS notes that Article 6bis is excluded.	[0, 1]	13	13	Coded	Surbeck
6	Copyright	copyright_ anti_ circumvention_technology_measures	**Anti-circumvention of technology protection measures**: This variable codes whether actions to circumvent TPMs (region lock, DRM, etc.) can be considered as copyright infringement.	Code if it covers at least circumvention for commercial use. Note: in Spanish PTAs search for "elusión (de medidas tecnológiacs de protección)" or "medidas de protección de tecnología	[0, 1]	38	38	Coded	Gold (domestic TRIPS+): cac-tpm

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
7	Trademark	trademark_ scope_3d_marks	Scope of protection: 3-D marks This variable codes the type of marks that may be registered under trademark legislation.	Code if 3-D marks (including fashion) are covered Note: in Spanish PTAs search for "tridimensional"	[0, 1]	2	2	Coded	Gold (domestic TRIPS+): tmsp1
8	Trademark	trademark_ scope_sounds	Scope of protection: Sounds This variable codes the type of marks that may be registered under trademark legislation.	Code if sounds are covered.	[0, 1]	37	37	Coded	Gold (domestic TRIPS+): tmsp2
9	Trademark	trademark_ scope_holograms	Scope of protection: Holograms This variable codes the type of marks that may be registered under trademark legislation.	Code if holograms are covered	[0, 1]	0	0	Coded	Gold (domestic TRIPS+): tmsp3
10	Trademark	trademark_ scope_scents _smells	Scope of protection: Scents/smells This variable codes the type of marks that may be registered under trademark legislation.	Code if scents/smells are covered.	[0, 1]	21	21	Coded	Gold (domestic TRIPS+): tmsp4
11	Trademark	trademark_ scope_movements	Scope of protection: Movements This variable codes the type of marks that may be registered under trademark legislation.	Code if movements are covered.	[0, 1]	0	0	Coded	Gold (domestic TRIPS+): tmsp5
12	Trademark	trademark_ scope_specific_colour	Scope of protection: Colours This variable codes the type of marks that may be registered under trademark legislation.	Code if (specific) colours are covered Note: For the colour indicator, arrangements of colour does not count, we are looking for the ability to trademark a specific colour.	[0, 1]	12	12	Coded	Gold (domestic TRIPS+): tmsp6
13	Trademark	trademark_ term	**Term of initial trademark protection**	Code if term of initial registration and each renewal of registration is more than 7 years (not non-use). Note: Clarification of TRIPS Art. 18	[0, 1]	34	33	Coded	Surbeck

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
14	Trademark	trademark_ dura-tion_with-out_use	**Duration of protection without use: more than 3 years** This variable codes for the number of years a trademark holder can refrain from using the mark without that mark being subject to expungement (losing protection for trademark).	Code if the duration of protection without use for trademarks is more than 3 years. (TRIPS Article 19.1 grants 3 years).	[0, 1]	5	4	Coded	Gold (domestic TRIPS+): trade-mark_dura-tion_with-out_use_5+
15	Trademark	trademark_ elec-tronic_regis-tration_sys-tem	**Electronic registration system** for trademarks	Countries shall provide for an electronic registration system for trademarks	[0, 1]	37	37	Coded	Cottier et al. 2016
16	Geograph-ical Indica-tions	geograph-ical_indica-tion_scope_agricultural	Scope of protection: **Agricultural products** This variable codes the extent of protection available to products **other than wine/spirits** in the form of geographical indications.	Code if agricultural products are covered. Code if geographical indications are granted for "any good"/"all products". Note 1: A GI indicator is not satisfied by laws/administrative bodies meant for Trade-marks -> excludes GI norms contained in Trademarks' sections. Note 2: Wine and Spirits are already protected under TRIPS.	[0, 1]	66	65	Coded	Gold (domestic TRIPS+): gisp1

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	698		
17	Geograph-ical Indica-tions	geograph-ical_indica-tion_scope_non_agricul-tural	Scope of protection: **Non-agri-cultural products** This variable codes the extent of protection available to products **other than wine/spirits** in the form of geographical indications.	Code if non-agricultural products (foodstuff) are covered. Code if geographical indications are granted for "any good"/"all products". Note 1: A GI indicator is not satisfied by laws/administrative bodies meant for Trade-marks -> excludes GI norms contained in Trademarks' sections. Wine and Spirits are already protected under TRIPS. Note 2: Foodstuff is not agricultural (processed goods)	[0, 1]	64	63	Coded	Gold (domestic TRIPS+): gisp2
18	Geograph-ical Indica-tions	geograph-ical_indica-tion_regis-tered_names_generic	Protection against genericity: This variable codes whether a **regis-tered geographical indication can become a generic** term for a product/service that others can use.	Code if registered names cannot become ge-neric. Note: A GI indicator is not satisfied by laws/ad-ministrative bodies meant for Trademarks -> excludes GI norms contained in Trademarks' sections.	[0, 1]	13	12	Coded	Gold (domestic TRIPS+): gipag

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
19	Geographical Indications	geographical_indication_extent_delocalizers	Extent of protection: **Delocalizers** This variable codes whether it is possible to circumvent GI protection by the use of delocalizers (product accompanied by expressions such as “imitation of”, “style”, “type”, “kind”, etc.) or by translation. This variable codes the extent of protection available to products other than wine/spirits in the form of geographical indications. Note: make sure that the PTA does not only cover wine and spirit related GIs and that the deloclizers are not only prohibited for wine and spirits (if so it is not TRIPS+ and should not be coded).	Code if delocalizers are prohibited without GI holder consent. Note: A GI indicator is not satisfied by laws/administrative bodies meant for Trademarks -> excludes GI norms contained in Trademarks' sections.	[0, 1]	18	17	Coded	Gold (domestic TRIPS+): giep1

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	698		
20	Geographical Indications	geographical_indication_extent_translations	Extent of protection: **Translations** This variable codes whether it is possible to circumvent GI protection by the use of delocalizers (product accompanied by expressions such as "imitation of", "style", "type", "kind", etc.) or by translation. This variable codes the extent of protection available to products other than wine/spirits in the form of geographical indications. Note: make sure that the PTA does not only cover wine and spirit related GIs and that the delocalizers are not only prohibited for wine and spirits (if so it is not TRIPS+ and should not be coded).	Code if translation are prohibited without GI holder consent. Note: A GI indicator is not satisfied by laws/administrative bodies meant for Trade-marks -> excludes GI norms contained in Trademarks' sections.	[0, 1]	19	18	Coded	Gold (domestic TRIPS+): giep2
21	Geographical Indications	geographical_indication_extent_homonymous	Extent of protection: **Homonymous geographical indications** This variable codes whether it is possible to circumvent GI protection by the use of homonymous goods This variable codes the extent of protection available to products other than wine/spirits in the form of geographical indications.	Homonymous means an ambiguous GI with multiple meaning which are defined by context. I.e. same name (spelled/pronounced) can stand for products from different places/countries Note 1: excludes GI norms contained in Trademarks' sections. Note 2: TRIPS grants protection to homonymous GIs, yet only for wines.	[0, 1]	24	23	Coded	Cottier et al. 2016

ID	Category	Variable	Description	Note	Range	Occurrence 724	Occurrence 698	Mode	Origin
22	Geographical Indications	geographical_indication_country_name	Commercial use of **country names** is protected	Note: excludes GI norms contained in Trademarks' sections.	[0, 1]	27	26	Coded	Cottier et al. 2016
23	Geographical Indications	geographical_indication_list	Codes specific GI lists	Note: this can range from a couple of protected names such as Pisco to page-long listings of protected GIs.	[0, 1]	44	44	Coded	Surbeck
24	Industrial Design	industrial_desgin_term	**Term** of industrial design protection	Code if term of protection is more than 10 years. Can be accumulated number of years. Note: This is a clarification of TRIPS Art. 26.3.	[0, 1]	52	51	Coded	Surbeck
25	Patent	patent_scope_plants	Scope of coverage: **Plants** This variable codes the nature of the inventions that can be patentable.	Code if **plants** are patentable. Sui generis system is not the same (other form of protection than patents). Note 1: only code if namely mentioned as patentable ("any invention", "any application", "any fields of technology" does not suffice). Note 2: excludes implicit patentability, e.g. if Parties are given the possibility to exclude plants from patentability. Note 3: Term "plant protection products" does not cover plants for patent protection as it refers to pesticides.	[0, 1]	17	17	Coded	Gold (domestic TRIPS+): psc4
26	Patent	patent_scope_animals	Scope of coverage: **Animals** This variable codes the nature of the inventions that can be patentable.	Code if **animals** are patentable. Note 1: only code if namely mentioned as patentable ("any invention", "any application", "any fields of technology" does not suffice). Note 2: excludes implicit patentability, e.g. if Parties are given the possibility to exclude plants from patentability.	[0, 1]	7	7	Coded	Gold (domestic TRIPS+): psc5

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
27	Patent	patent_scope_transitional_extention	**Transitional extension for developing countries**. TRIPS Article 65.2 grants a transitional period for DCs.	Code if there are transitional extensions for developing countries. Note 1: includes references to transitional extension for intellectual property rights in general as it includes patents. Note 2: already coded for all countries in DESTA dataset.	[0, 1]	16	15	Coded	Gold (domestic TRIPS+): patent_scope_trans_extention
28	Patent	patent_permitted_second_use	Permitted double-patenting (selection/second Use): S**econd-use patents** This variable codes for the availability of selection patents (i.e. a patent claiming a subclass of a previously patent genus for a particular feature not included in the initial patent) or second-use patents (i.e. a patent claiming a new use from a previously existing patent).	Code if second-use/new use of patents are allowed. Note: Patents of Addition do not qualify for either Selection or Second Use.	[0, 1]	8	8	Coded	Gold (domestic TRIPS+): ppdp2
29	Patent	patent_term_extension	**Patent term extensions**: This variable codes whether an extension is given to patent term when regulation requirements have unduly delayed market entry.	Code if there is compensation/ patent term extension (further period) for unreasonable delay due to patent examination and/or marketing approval process.	[0, 1]	40	40	Coded	Gold (domestic TRIPS+): patent_term_extension

ID	Category	Variable	Description	Note	Range	Occurrence 724	698	Mode	Origin
30	Patent	patent_compulsory_licenses_restriction	**Compulsory licenses are restricted/limited** to specific scenarios/ grounds	Limited to national emergencies, as antitrust remedy, and for public non-commercial use (limits competition for generic products such as medicines). Note 1: Compulsory licenses can be circumscribed as "Neither Party shall permit the use of the subject matter of a patent without the authorization of the right holder except in the following circumstances". Note 2: TRIPS grants right for each country to determine the grounds upon which licenses are granted. TRIPS makes examples, but does not provide a fixed list. Note 3: in Spanish PTAs search for "licencias obligatorias"	[0, 1]	3	3	Coded	Lindstrom 2010
31	Patent	patent_novelty_disclosure_grace_period	**Novelty/disclosure grace period**: This variable codes the length of the grace period in which a patentee may disclose the invention without that disclosure being considered as prior art to invalidate the patent based on novelty.	Code if 12 months Note: in Spanish PTAs search for "periodo de gracia" or "novedad/novela"	[0, 1]	17	17	Coded	Gold (domestic TRIPS+): pndgp
32	Patent	patent_burden_proof_patent_office	Burden of proof: This variable codes whether, when examining an invention, the **burden of proof lies on the patent office** or on the applicant to demonstrate non-patentability/patentability.	Code if burden of proof lies on the patent office, i.e. if the patent office has to prove that an invention is or is not patentable. Code as '0' if country has a formal review only. Note: make sure not to confuse it with the TRIPS burden of proof (Article 34).	[0, 1]	0	0	Coded	Gold (domestic TRIPS+): pbp
33	Patent	patent_revocation_restrictions	**Restriction of revocation** rights for patents	Restriction of revocation rights for patents to cases of fraud and misrepresentation (limits flexibility granted under TRIPS).	[0, 1]	21	21	Coded	El-Said 2005

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
34	Undisclosed Information	undis-closed_in-for-mation_scope	**Scope of trade secret protection**: This variable codes whether or not a country exceeds TRIPs' expectations on the definition of trade secret.	Code if the definition of trade secret is broader than the TRIPS definition ; 0 if the definition is no broader (or less broad) than that in TRIPs article 39(2) 1) check if there is something specific on trade secrets in PTA 2) if yes: compare to TRIPS Article 39 3) Examples of TRIPS+: No limitation of duration; detailed definition of trade secret (documents, microfilms) Note: in Spanish PTAs search for "secreto comercial/industrial/de negocio"	[0, 1]	8	8	Coded	Gold (domestic TRIPS+): cisp
35	Undisclosed Information	undis-closed_in-for-mation_lia-bility_dis-closure	Scope of liability: **Disclosure** type of action that can trigger liability for misappropriation of a trade secret	Code if disclosure of trade secrets can be litigated as misappropriation (criminal procedures and penalties).	[0, 1]	3	3	Coded	Gold (domestic TRIPS+): cisl1
36	Undisclosed Information	undis-closed_in-for-mation_lia-bility_re-ceipt	Scope of liability: **Receipt** type of action that can trigger liability for misappropriation of a trade secret	Code if receipt of trade secrets can be litigated as misappropriation including inducing disclosure (criminal procedures and penalties).	[0, 1]	3	3	Coded	Gold (domestic TRIPS+): cisl2
37	Undisclosed Information	undis-closed_in-for-mation_lia-bility_use	Scope of liability: **Use** type of action that can trigger liability for misappropriation of a trade secret	Code if use of trade secrets can be litigated as misappropriation (criminal procedures and penalties).	[0, 1]	3	3	Coded	Gold (domestic TRIPS+): cisl3

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	698		
38	Undisclosed Information	undis-closed_in-for-mation_test_data_exclu-sivity	**Test data exclusivity for a specific timeframe**	Code if there is a specific period or additionaly exclusivity for test data (e.g. due to new clinical information). Often around 3-5 years. Note: in Spanish PTAs search for "aprobación de comercialización"	[0, 1]	41	41	Coded	Lindstrom 2010
39	Undisclosed Information	undis-closed_in-for-mation_test_data_new_us e	**Test data exclusivity for new uses** of registered products	Code if marketing approval for unapproved use of approved drugs (new use of patented product) requires new clinical data. This test data is exclusive (limited timeframe).	[0, 1]	8	8	Coded	Fink Reichenmiller 2005a
40	Undisclosed Information	undis-closed_in-for-mation_test_data_for-eign_ap-proved_sub-mitted	Foreign test data exclusivity for **accepted/approved** and/ or **submitted** applications	Test data exclusivity is allowed, also for marketing approval submissions of foreign regulators for same products in home market.	[0, 1]	14	14	Coded	Fink Reichenmiller 2005a
41	Semiconductors	layout_de-sign_no_co mpulsory_li-cense	**Prohibition of compulsory licenses** for layout designs	Compulsory license not permitted for layout designs	[0, 1]	3	3	Coded	Surbeck
42	New Plant Varieties	new_plant_v ari-eties_upov_a cceed_reaf-firm	**Accession/Reaffirmation of the International Convention for the Protection of New Varieties of Plants** (UPOV) (1961)	Code if the PTA reaffirms the UPOV Convention Note 1: Convention references are already coded in DESTA. Note 2: Code as '1' if level of regulation in DESTA is 5 (reaffirmation) or 4 (accession). Note 3: Accession/Reaffirmation of the UPOV Convention is TRIPS +	[0, 1]	83	83	Coded	Surbeck

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	698		
43	New Plant Varieties	new_plant_vari-eties_upov_plus	Specific regulation on new plant varieties, which go <u>beyond</u> the **UPOV Convention**.	Not coded if there is only a reference to UPOV or if the Article in the PTA is copying UPOV regulations.	[0, 1]	13	12	Coded	Surbeck
44	Traditional Knowledge & Genetic Resources	genetic_re-sources_duty_to_con-sult_prior_informed_con-sent_hard	**Duty to consult/prior informed consent: Genetic resources (binding obligations)** This variable codes whether a proposed user of TK or GR must first obtain prior informed con-sent from the use of genetic re-sources or traditional knowledge from the country/indigenous peo-ple/local community.	Code if there is a duty to obtain consent before use of genetic resources Includes shall, should, must, have to, etc. <u>Hard version:</u> binding commitments ("acknowledge", "reaffirm", "shall", "should", "must", "have"). Note 1: TK/GR provisions can occur in other sections of PTA than IPR chapter. Note 2: in Spanish PTAs search for "consenti-miento"	[0, 1]	12	12	Coded	Gold (domestic TRIPS+): grtkdc1
45	Traditional Knowledge & Genetic Resources	genetic_re-sources_duty_to_con-sult_prior_informed_con-sent_soft	**Duty to consult/prior informed consent: Genetic resources (non-binding obligations)** This variable codes whether a proposed user of TK or GR must first obtain prior informed con-sent from the use of genetic re-sources or traditional knowledge from the country/indigenous peo-ple/local community.	Code if there is a duty to obtain consent before use of genetic resources Includes may, best efforts, resolve, wish, etc. <u>Soft version:</u> non-binding commitments (""may"", ""best efforts"", ""resolve"", ""wish""). Note 1: TK/GR provisions can occur in other sections of PTA than IPR chapter. Note 2: in Spanish PTAs search for "consenti-miento"	[0, 1]	0	0	Coded	Gold (domestic TRIPS+): grtkdc1
46	Traditional Knowledge & Genetic Resources	tradi-tional_knowledge_duty_to_con-sult_prior_informed_con-sent_hard	**Duty to consult/prior informed consent: traditional knowledge (binding obligations)** This variable codes whether a proposed user of TK or GR must first obtain prior informed con-sent from the use of genetic re-sources or traditional knowledge	Code if there is a duty to obtain consent before use of traditional knowledge Includes shall, should, must, have to, etc. <u>Hard version</u>: binding commitments ("acknowledge", "reaffirm", "shall", "should", "must", "have"). Note 1: TK/GR provisions can occur in other sections of PTA than IPR chapter.	[0, 1]	11	11	Coded	Gold (domestic TRIPS+): grtkdc2

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	698		
			from the country/indigenous people/local community.	Note 2: in Spanish PTAs search for "consentimiento"					
47	Traditional Knowledge & Genetic Resources	traditional_knowledge_duty_to_consult_prior_informed_consent_soft	**Duty to consult/prior informed consent: traditional knowledge (non-binding obligations)** This variable codes whether a proposed user of TK or GR must first obtain prior informed consent from the use of genetic resources or traditional knowledge from the country/indigenous people/local community.	Code if there is a duty to obtain consent before use of traditional knowledge Includes may, best efforts, resolve, wish, etc. Soft version: non-binding commitments (""may"", ""best efforts"", ""resolve"", ""wish""). Note 1: TK/GR provisions can occur in other sections of PTA than IPR chapter. Note 2: in Spanish PTAs search for "consentimiento"	[0, 1]	0	0	Coded	Gold (domestic TRIPS+): grtkdc2
48	Traditional Knowledge & Genetic Resources	genetic_resources_defensive_protection_disclosure_of_source_hard	**Defensive protection/disclosure of the source - patent: Genetic resources (binding obligations)** This variable codes whether or not there is a requirement for the patent holder to indicate the origin of genetic resources/traditional knowledge used in a patent application.	Code if patent application must disclose origin of genetic resources used The requirements for this indicator is met even if an applicant is relieved of the obligation to disclose it when origin is unknown. Includes shall, should, must, have to, etc. Hard version: binding commitments ("acknowledge", "reaffirm", "shall", "should", "must", "have"). Note 1: TK/GR provisions can occur in other sections of PTA than IPR chapter. Note 2: in Spanish PTAs search for "divulgación del origen"	[0, 1]	8	8	Coded	Gold (domestic TRIPS+): grtkdp1

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
49	Traditional Knowledge & Genetic Resources	genetic_re-sources_de-fensive_pro-tection_dis-clo-sure_of_source_soft	**Defensive protection/disclosure of the source - patent: Genetic resources (non-binding obliga-tions)** This variable codes whether or not there is a requirement for the patent holder to indicate the origin of genetic resources/tradi-tional knowledge used in a patent application.	Code if patent application must disclose origin of genetic resources used The requirements for this indicator is met even if an applicant is relieved of the obligation to disclose it when origin is unknown. Includes may, best efforts, resolve, wish, etc. Soft version: non-binding commitments (""may"", ""best efforts"", ""resolve"", ""wish""). Note 1: TK/GR provisions can occur in other sections of PTA than IPR chapter. Note 2: in Spanish PTAs search for "divul-gación del origen"	[0, 1]	2	2	Coded	Gold (domestic TRIPS+): grtkdp1
50	Traditional Knowledge & Genetic Resources	tradi-tional_knowledge_defen-sive_protec-tion_disclo-sure_of_source_hard	**Defensive protection/disclosure of the source - patent: tradi-tional knowledge (binding obli-gations)** This variable codes whether or not there is a requirement for the patent holder to indicate the origin of genetic resources/tradi-tional knowledge used in a patent application.	Code if patent application must disclose origin of traditional knowledge used The requirements for this indicator is met even if an applicant is relieved of the obligation to disclose it when origin is unknown. Includes shall, should, must, have to, etc. Hard version: binding commitments ("acknowledge", "reaffirm", "shall", "should", "must", "have"). Note 1: TK/GR provisions can occur in other sections of PTA than IPR chapter. Note 2: in Spanish PTAs search for "divul-gación del origen"	[0, 1]	6	6	Coded	Gold (domestic TRIPS+): grtkdp2

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	698		
51	Traditional Knowledge & Genetic Resources	traditional_knowledge_defensive_protection_disclosure_of_source_soft	**Defensive protection/disclosure of the source - patent: traditional knowledge (non-binding obligations)** This variable codes whether or not there is a requirement for the patent holder to indicate the origin of genetic resources/traditional knowledge used in a patent application.	Code if patent application must disclose origin of traditional knowledge used The requirements for this indicator is met even if an applicant is relieved of the obligation to disclose it when origin is unknown. Includes may, best efforts, resolve, wish, etc. Soft version: non-binding commitments (""may"", ""best efforts"", ""resolve"", ""wish""). Note 1: TK/GR provisions can occur in other sections of PTA than IPR chapter. Note 2: in Spanish PTAs search for "divulgación del origen"	[0, 1]	1	1	Coded	Gold (domestic TRIPS+): grtkdp2
52	Traditional Knowledge & Genetic Resources	genetic_resources_benefit_sharing_hard	**Benefit sharing/equitable sharing of benefits: Genetic resources (binding obligations)** This variable codes the existence of a mandated equitable benefits sharing mechanism enforced by government.	Code if some form of mandatory, fair and equitable benefits sharing for genetic resources is mandated Includes shall, should, must, have to, etc. Hard version: binding commitments ("acknowledge", "reaffirm", "shall", "should", "must", "have"). Note 1: TK/GR provisions can occur in other sections of PTA than IPR chapter. Note 2: in Spanish PTAs search for "participación justa y equitativa en los beneficios"	[0, 1]	16	16	Coded	Gold (domestic TRIPS+): grtkbs1

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	698		
53	Traditional Knowledge & Genetic Resources	genetic_re-sources_ben-efit_shar-ing_soft	**Benefit sharing/equitable sharing of benefits: Genetic resources (non-binding obligations)** This variable codes the existence of a mandated equitable benefits sharing mechanism enforced by government.	Code if some form of mandatory, fair and equitable benefits sharing for genetic resources is mandated Includes may, best efforts, resolve, wish, etc. <u>Soft version</u>: non-binding commitments (""may"", ""best efforts"", ""resolve"", ""wish""). Note 1: TK/GR provisions can occur in other sections of PTA than IPR chapter. Note 2: in Spanish PTAs search for "participación justa y equitativa en los beneficios"	[0, 1]	7	7	Coded	Gold (domestic TRIPS+): grtkbs1
54	Traditional Knowledge & Genetic Resources	tradi-tional_knowl edge_bene-fit_shar-ing_hard	**Benefit sharing/equitable sharing of benefits: traditional knowledge (binding obligations)** This variable codes the existence of a mandated equitable benefits sharing mechanism enforced by government.	Code if some form of mandatory, fair and equitable benefits sharing for traditional knowledge is mandated Includes shall, should, must, have to, etc. <u>Hard version</u>: binding commitments ("acknowledge", "reaffirm", "shall", "should", "must", "have"). Note 1: TK/GR provisions can occur in other sections of PTA than IPR chapter. Note 2: in Spanish PTAs search for "participación justa y equitativa en los beneficios"	[0, 1]	14	14	Coded	Gold (domestic TRIPS+): grtkbs2
55	Traditional Knowledge & Genetic Resources	tradi-tional_knowl edge_bene-fit_shar-ing_soft	**Benefit sharing/equitable sharing of benefits: traditional knowledge (non-binding obligations)** This variable codes the existence of a mandated equitable benefits sharing mechanism enforced by government.	Code if some form of mandatory, fair and equitable benefits sharing for traditional knowledge is mandated Includes may, best efforts, resolve, wish, etc. <u>Soft version</u>: non-binding commitments (""may"", ""best efforts"", ""resolve"", ""wish""). Note 1: TK/GR provisions can occur in other sections of PTA than IPR chapter. Note 2: in Spanish PTAs search for "participación justa y equitativa en los beneficios"	[0, 1]	7	7	Coded	Gold (domestic TRIPS+): grtkbs2

ID	Category	Variable	Description	Note	Range	Occurrence 724	Occurrence 698	Mode	Origin
56	Encrypted program-carrying satellite signals	encrypted_program_carrying_satellite_signals	**Protection of encrypted program-carrying satellite signals**	Code if encrypted program-carrying satellite signals are protected.	[0, 1]	29	29	Coded	Surbeck
57	Domain names	domain_names	Protection of **domain names** on the internet	Code if domain names on the internet are protected.	[0, 1]	17	17	Coded	Surbeck
58	Enforcement	enforcement_preliminary_injunctions_patent	**Preliminary injunctions: Patent** This variable codes for whether preliminary injunctions are available for patent, copyright, and trademark infringement actions.	Code if available for patent. Note 1: Preliminary/ interlocutory injunctions is an instrument to protect the right owner before actual judicial decision on case of infringement is made. Note 2: also code if available for IP in general. Note 3: in Spanish PTAs search for "medidas cauteleras/preliminares", "resolución interlocutoria" or "orden/madamiento preliminar"	[0, 1]	16	16	Coded	Gold (domestic TRIPS+): epi1
59	Enforcement	enforcement_preliminary_injunctions_copyright	**Preliminary injunctions: Copyright** This variable codes for whether preliminary injunctions are available for patent, copyright, and trademark infringement actions.	Code if available for copyright. Note 1: Preliminary/ interlocutory injunctions is an instrument to protect the right owner before actual judicial decision on case of infringement is made. Note 2: also code if available for IP in general. Note 3: in Spanish PTAs search for "medidas cauteleras/preliminares", "resolución interlocutoria" or "orden/madamiento preliminar"	[0, 1]	11	11	Coded	Gold (domestic TRIPS+): epi2

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
60	Enforcement	enforce-ment_pre-liminary_in-junc-tions_trade-marks	**Preliminary injunctions: Trade-marks** This variable codes for whether preliminary injunctions are avail-able for patent, copyright, and trademark infringement actions.	Code if available for trademark. Note 1: Preliminary/ interlocutory injunctions is an instrument to protect the right owner before actual judicial decision on case of infringement is made. Note 2: also code if available for IP in general. Note 3: in Spanish PTAs search for "medidas cauteleras/preliminares", "resolución interlocu-toria" or "orden/madamiento preliminar"	[0, 1]	11	11	Coded	Gold (domestic TRIPS+): epi3
61	Enforcement	enforce-ment_ex_par te_search_an d_sei-zure_patent	**Ex parte search and seizure: Patent** This variable codes whether it is possible for a party to ask for search and seizure of goods with-out notifying the other party of this procedure (i.e. Anton Piller order).	Code if available for patent. Note 1: also code if either only search (of goods/premises) or only seizure (of goods/evi-dence) without prior warning as precautionary measure for alleged infringed goods is men-tioned. Note 2: also code if available for IP in general. Note 3: in Spanish PTAs search for "embargo" or "retirados de los circuitos comerciales"	[0, 1]	29	29	Coded	Gold (domestic TRIPS+): eepss1
62	Enforcement	enforce-ment_ex_par te_search_an d_sei-zure_copy-right	**Ex parte search and seizure: Copyright** This variable codes whether it is possible for a party to ask for search and seizure of goods with-out notifying the other party of this procedure (i.e. Anton Piller order).	Code if available for copyright. Note 1: also code if either only search (of goods/premises) or only seizure (of goods/evi-dence) without prior warning as precautionary measure for alleged infringed goods is men-tioned. Note 2: also code if available for IP in general. Note 3: in Spanish PTAs search for "embargo" or "retirados de los circuitos comerciales"	[0, 1]	51	51	Coded	Gold (domestic TRIPS+): eepss2

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
63	Enforcement	enforce-ment_ex_parte_search_and_sei-zure_trade-mark	**Ex parte search and seizure: Trademarks** This variable codes whether it is possible for a party to ask for search and seizure of goods with-out notifying the other party of this procedure (i.e. Anton Piller order).	Code if available for trademark. Note 1: also code if either only search (of goods/premises) or only seizure (of goods/evi-dence) without prior warning as precautionary measure for alleged infringed goods is men-tioned. Note 2: also code if available for IP in general. Note 3: in Spanish PTAs search for "embargo" or "retirados de los circuitos comerciales"	[0, 1]	49	49	Coded	Gold (domestic TRIPS+): eepss3
64	Enforcement	enforce-ment_statu-tory_dam-ages_patent	Measure of damages: **Statutory damages, patent** This variable codes for the types of damages that are available for patent, copyright, and trademarks infringement.	Code if statutory damages are available for pa-tent. Note 1: Statutory damages are **predefined/pre-established damages** awarded for cases of in-fringement. Level of damage award is thus based on the act of infringement and not on the specific harm caused in specific case. It is used in IP infringement cases because it is often dif-ficult to establish the value loss suffered by IP owners. Note 2: also code if available for IP in general. Note 3: in Spanish PTAs search for "daños pre-viamente determinados"	[0, 1]	15	15	Coded	Gold (domestic TRIPS+): emdp1

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
65	Enforcement	enforce-ment_statu-tory_dam-ages_copy-right	Measure of damages: **Statutory damages, copyright** This variable codes for the types of damages that are available for patent, copyright, and trademarks infringement.	Code if statutory damages are available for cop-yright. Note 1: Statutory damages are **predefined/pre-established damages** awarded for cases of in-fringement. Level of damage award is thus based on the act of infringement and not on the specific harm caused in specific case. It is used in IP infringement cases because it is often dif-ficult to establish the value loss suffered by IP owners. Note 2: also code if available for IP in general. Note 3: in Spanish PTAs search for "daños pre-viamente determinados"	[0, 1]	40	40	Coded	Gold (domestic TRIPS+): emdc1
66	Enforcement	enforce-ment_statu-tory_dam-ages_trade-marks	Measure of damages: **Statutory damages, trademarks** This variable codes for the types of damages that are available for patent, copyright, and trademarks infringement.	Code if statutory damages are available for trademarks. Note 1: Statutory damages are **predefined/pre-established damages** awarded for cases of in-fringement. Level of damage award is thus based on the act of infringement and not on the specific harm caused in specific case. It is used in IP infringement cases because it is often dif-ficult to establish the value loss suffered by IP owners. Note 2: also code if available for IP in general. Note 3: in Spanish PTAs search for "daños pre-viamente determinados"	[0, 1]	33	33	Coded	Gold (domestic TRIPS+): emdtm1

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
67	Enforcement	enforce-ment_com-pensa-tory_dam-ages_patent	Measure of damages: **Compensa-tory damages, patent** This variable codes for the types of damages that are available for patent, copyright, and trademarks infringement.	Code if compensatory damages are available for patent. Note 1: Compensatory damages are damages that compensate/counterbalance/reimburse the owner of IPRs in cases of infringement. Note 2: also code if available for IP in general. Note 3: in Spanish PTAs search for "indemniza-ción/resarcimiento/comensación" or "daño"	[0, 1]	56	56	Coded	Gold (domestic TRIPS+): emdp2
68	Enforcement	enforce-ment_com-pensa-tory_dam-ages_copy-right	Measure of damages: **Compensa-tory damages, copyright** This variable codes for the types of damages that are available for patent, copyright, and trademarks infringement.	Code if compensatory damages are available for copyright. Note 1: Compensatory damages are damages that compensate/counterbalance/reimburse the owner of IPRs in cases of infringement. Note 2: also code if available for IP in general. Note 3: in Spanish PTAs search for "indemniza-ción/resarcimiento/comensación" or "daño"	[0, 1]	58	58	Coded	Gold (domestic TRIPS+): emdc2
69	Enforcement	enforce-ment_com-pensa-tory_dam-ages_trade-marks	Measure of damages: **Compensa-tory damages, trademarks** This variable codes for the types of damages that are available for patent, copyright, and trademarks infringement.	Code if compensatory damages are available for trademarks. Note 1: Compensatory damages are damages that compensate/counterbalance/reimburse the owner of IPRs in cases of infringement. Note 2: also code if available for IP in general. Note 3: in Spanish PTAs search for "indemniza-ción/resarcimiento/comensación" or "daño"	[0, 1]	58	58	Coded	Gold (domestic TRIPS+): emdtm2
70	Enforcement	enforce-ment_dam-ages_ac-count-ing_of_prof-its_patent	Measure of damages: **Accounting of profits, patent** This variable codes for the types of damages that are available for patent, copyright, and trademarks infringement.	Code if accounting of profits is available for pa-tent. Note 1: Accounting of profits is when the dam-ages include (recovery of) profits gained by IPR infringement. Note 2: also code if available for IP in general.	[0, 1]	23	23	Coded	Gold (domestic TRIPS+): emdp3

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
71	Enforcement	enforce-ment_dam-ages_ac-count-ing_of_prof-its_copyright	Measure of damages: **Accounting of profits, copyright** This variable codes for the types of damages that are available for patent, copyright, and trademarks infringement.	Code if accounting of profits is available for copyright. Note 1: Accounting of profits is when the dam-ages include (recovery of) profits gained by IPR infringement. Note 2: also code if available for IP in general.	[0, 1]	43	43	Coded	Gold (domestic TRIPS+): emdc3
72	Enforcement	enforce-ment_dam-ages_ac-count-ing_of_prof-its_trade-mark	Measure of damages: **Accounting of profits, trademarks** This variable codes for the types of damages that are available for patent, copyright, and trademarks infringement.	Code if accounting of profits is available for trademarks. Note 1: Accounting of profits is when the dam-ages include (recovery of) profits gained by IPR infringement. Note 2: also code if available for IP in general.	[0, 1]	39	39	Coded	Gold (domestic TRIPS+): emdtm3
73	Enforcement	enforce-ment_puni-tive_dam-ages_patent	Measure of damages: **Punitive damages, patent** This variable codes for the types of damages that are available for patent, copyright, and trademarks infringement.	Code if punitive damages are available for pa-tent. Note 1: Punitive/exemplary damages are dam-ages imposed to deter alleged infringer/others from (further) committing IPR infringement by setting the damage higher than what the evi-dence-based loss could be (e.g. exceeding statu-tory damages). Often additional damages to al-ready imposed damages based on the severity of the infringement. Note 2: Includes references providing for the possibility to impose sanctions on parties to a litigation, their counsel, experts, or other per-sons subject to the court's jurisdiction, for vio-lation of judicial orders regarding the protection of undisclosed information produced or ex-changed in a proceeding. Note 3: Excludes criminal penalties (e.g. pecu-niary fines). Note 4: Also code if available for IP in general.	[0, 1]	1	1	Coded	Gold (domestic TRIPS+): emdp4

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
74	Enforcement	enforce-ment_puni-tive_dam-ages_copy-right	Measure of damages: **Punitive damages, copyright** This variable codes for the types of damages that are available for patent, copyright, and trademarks infringement.	Code if punitive damages are available for pa-tent. Note 1: Punitive/exemplary damages are dam-ages imposed to deter alleged infringer/others from (further) committing IPR infringement by setting the damage higher than what the evi-dence-based loss could be (e.g. exceeding statu-tory damages). Often additional damages to al-ready imposed damages based on the severity of the infringement. Note 2: Includes references providing for the possibility to impose sanctions on parties to a litigation, their counsel, experts, or other per-sons subject to the court's jurisdiction, for vio-lation of judicial orders regarding the protection of undisclosed information produced or ex-changed in a proceeding. Note 3: Excludes criminal penalties (e.g. pecu-niary fines). Note 4: Also code if available for IP in general.	[0, 1]	5	5	Coded	Gold (domestic TRIPS+): emdc4

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
75	Enforcement	enforce-ment_puni-tive_dam-ages_trade-marks	Measure of damages: **Punitive damages, trademarks** This variable codes for the types of damages that are available for patent, copyright, and trademarks infringement.	Code if punitive damages are available for pa-tent. Note 1: Punitive/exemplary damages are dam-ages imposed to deter alleged infringer/others from (further) committing IPR infringement by setting the damage higher than what the evi-dence-based loss could be (e.g. exceeding statu-tory damages). Often additional damages to al-ready imposed damages based on the severity of the infringement. Note 2: Includes references providing for the possibility to impose sanctions on parties to a litigation, their counsel, experts, or other per-sons subject to the court's jurisdiction, for vio-lation of judicial orders regarding the protection of undisclosed information produced or ex-changed in a proceeding. Note 3: Excludes criminal penalties (e.g. pecu-niary fines). Note 4: Also code if available for IP in general.	[0, 1]	4	4	Coded	Gold (domestic TRIPS+): emdtm4
76	Enforcement	enforce-ment_crimi-nal_sanc-tions_patent	**Criminal sanctions for IP In-fringement: Patent** This variable codes for the availa-bility of criminal sanctions for IP infringement	Code if criminal sanctions are available for pa-tent. Note 1: Criminal sanctions include imprison-ment, fines, capital punishment, restitution. Note 2: TRIPS already grants criminal sanctions for copyrights and trademarks thus not coded. Note 3: also code if available for IP in general.	[0, 1]	16	16	Coded	Gold (domestic TRIPS+): ec-sipi1

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
77	Enforcement	enforce-ment_pre-sump-tion_of_va-lidity_patent	**Presumption of validity: Patent** This variable codes for the existence of a presumption of validity in favour of the holder of the IP right in any litigation.	Code if presumption of validity for patent exists, i.e. patent is considered to be valid. Note 1: Procedural consideration (preliminary injunctions, order of issues, etc.) that may lead to a form of presumption of validity in favour of the IP holder do not count toward this indicator. Note 2: This differs from the presumption applies by the IP office in reviewing applications for IP. Note 3: also code if available for IP in general.	[0, 1]	14	14	Coded	Gold (domestic TRIPS+): epv1
78	Enforcement	enforce-ment_pre-sump-tion_of_va-lidity_copy-right	**Presumption of validity: Copyright** This variable codes for the existence of a presumption of validity in favour of the holder of the IP right in any litigation.	Code if presumption of validity for copyright exists (presumption of authorship or ownership), i.e. copyright is considered to be valid. Note 1: Procedural consideration (preliminary injunctions, order of issues, etc.) that may lead to a form of presumption of validity in favour of the IP holder do not count toward this indicator. Note 2: This differs from the presumption applies by the IP office in reviewing applications for IP. Note 3: also code if available for IP in general.	[0, 1]	31	31	Coded	Gold (domestic TRIPS+): epv2
79	Enforcement	enforce-ment_pre-sump-tion_of_va-lidity_trade-mark	**Presumption of validity: Trademark** This variable codes for the existence of a presumption of validity in favour of the holder of the IP right in any litigation. Note: Also code for trademark licenses	Code if presumption of validity for trademarks exists, i.e. trademark is considered to be valid. Note 1: Procedural consideration (preliminary injunctions, order of issues, etc.) that may lead to a form of presumption of validity in favour of the IP holder do not count toward this indicator. Note 2: This differs from the presumption applies by the IP office in reviewing applications for IP. Note 3: also code if available for IP in general.	[0, 1]	16	16	Coded	Gold (domestic TRIPS+): epv3

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
80	Enforcement	enforcement_restriction_of_insitutional_flexibility	**Restriction of institutional flexibility** in IPR enforcement	Code if the flexibility regarding IPR enforcement is restricted, e.g. resource constraints shall not prevent IPR enforcement. Note: in Spanish PTAs search for "distribución de los recursos"	[0, 1]	11	11	Coded	Lindstrom 2010
81	Enforcement	enforcement_border_measures_importing_exporting_transiting_goods	Border measures: Code if border measures apply to **imported and exported or/and transiting goods**	Note: TRIPS applies border measures only to imported goods, except for suspension of exported goods.	[0, 1]	84	84	Coded	Lindstrom 2010
82	Enforcement	enforcement_criminal_procedures_remedies_no_formal_complaint_copyright	Criminal Procedures and Remedies: **no formal complaint** needed for **copyright** infringement	Copyright infringement (piracy): authorities may initiate criminal actions and border measures without the need for formal complaint. Note: in Spanish PTAs search for "solicitud formal"	[0, 1]	48	48	Coded	El-Said 2005
83	Enforcement	enforcement_criminal_procedures_remedies_no_formal_complaint_trademark	Criminal Procedures and Remedies: **no formal complaint** needed for **trademark** infringement	Trademark infringement (counterfeiting): authorities may initiate criminal actions and border measures without the need for formal complaint. Note: in Spanish PTAs search for "solicitud formal"	[0, 1]	48	48	Coded	El-Said 2005

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
84	Enforcement	enforce-ment_ser-vice_pro-vider_liabil-ity_copy-right	Is there a service provider liability defined for the enforcement of IPRs?	Expeditious remedies to prevent infringements and criminal and civil remedies - legal incentives for service providers to coop-erate with copyright owners in deterring the un-authorised storage and transmission of copy-righted materia - limitations preclude monetary relief and should provide restrictions on court-ordered re-lief to compel or restrain e.g. transmitting and routing	[0, 1]	29	29	Coded	Surbeck
85	Exhaustion	exhaus-tion_na-tional_pa-tents	**National exhaustion** for **patents** is stated	Code if anti-parallel importation provisions ex-ist for importation beyond the country (national exhaustion) for patents Note 1: also code if available for IP in general. Note 2: in Spanish PTAs search for "agota-miento" or "importación paralela"	[0, 1]	4	4	Coded	Gold (domestic TRIPS+)
86	Exhaustion	exhaus-tion_re-gional_pa-tents	**Regional exhaustion** for **patents** is stated	Code if anti-parallel importation provisions ex-ist for importation beyond the region (regional exhaustion) for patents Note 1: also code if available for IP in general. Note 2: in Spanish PTAs search for "agota-miento" or "importación paralela"	[0, 1]	4	4	Coded	Gold (domestic TRIPS+)
87	Exhaustion	exhaus-tion_na-tional_copy-right	**National exhaustion** for **copy-rights** is stated	Code if anti-parallel importation provisions ex-ist for importation beyond the country (national exhaustion) for copyrights Note 1: also code if available for IP in general. Note 2: in Spanish PTAs search for "agota-miento" or "importación paralela"	[0, 1]	4	4	Coded	Gold (domestic TRIPS+)

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
88	Exhaustion	exhaus-tion_re-gional_copy-right	**Regional exhaustion** for **copy-rights** is stated	Code if anti-parallel importation provisions ex-ist for importation beyond the region (regional exhaustion) for copyrights Note 1: also code if available for IP in general. Note 2: in Spanish PTAs search for "agota-miento" or "importación paralela"	[0, 1]	5	5	Coded	Gold (domestic TRIPS+)
89	Exhaustion	exhaus-tion_na-tional_trade-marks	**National exhaustion** for **trade-marks** is stated	Code if anti-parallel importation provisions ex-ist for importation beyond the country (national exhaustion) for trademarks Note 1: also code if available for IP in general. Note 2: in Spanish PTAs search for "agota-miento" or "importación paralela"	[0, 1]	3	3	Coded	Gold (domestic TRIPS+)
90	Exhaustion	exhaus-tion_re-gional_trade marks	**Regional exhaustion** for **trade-marks** is stated	Code if anti-parallel importation provisions ex-ist for importation beyond the region (regional exhaustion) for trademarks Note 1: also code if available for IP in general. Note 2: in Spanish PTAs search for "agota-miento" or "importación paralela"	[0, 1]	4	4	Coded	Gold (domestic TRIPS+)
C	Comment	comment	Comment regarding coding deci-sion or specific PTAs					Comment	T+PTA
I_01	Index	trip-splus_sum	Sum of **all coded TRIPS-plus** provisions	Sum of TRIPS-plus provisions across IPR areas (I_05:I_15), enforcement (I_27) and exhaustion (I_35) Formula: sum(I_05:I_15)+I_27+I_35	[0, 87]			Calculated	
I_02	Index	trip-splus_weigh ed	Sum of all coded TRIPS-plus pro-visions, **weighed**	Sum of TRIPS-plus provisions across IPR areas (I_16:I_26), enforcement (I_28) and exhaustion (I_36) Formula: sum(I_16:I_26)+I_28+I_36	[0, 1]			Calculated	T+PTA

ID	Category	Variable	Description	Note	Range	Occurrence 724	698	Mode	Origin
I_03	Index	tripsplus_no_enforcement_exhaustion_sum	Sum of all coded TRIPS-plus provisions, excluding enforcement and exhaustion provisions	Sum of TRIPS-plus provisions across IPR areas (I_05:I_15), not taking into account the variables for enforcement (I_27) and exhaustion (I_35) Formula: sum(I_05:I_15)	[0, 21]			Calculated	T+PTA
I_04	Index	tripsplus_no_enforcement_exhaustion_weighed	Sum of all coded TRIPS-plus provisions, excluding enforcement and exhaustion provisions, **weighed**	Sum of TRIPS-plus provisions across IPR areas (I_16:I_26), , not taking into account the variables for enforcement (I_28) and exhaustion (I_36) Formula: sum(I_16:I_26)	[0, 1]			Calculated	T+PTA
I_05	Index	copyright_6_max5	Sum of all coded TRIPS-plus provisions on **copyright**	Formula: sum(variable1:variable6)	[0, 5]			Calculated	T+PTA
I_06	Index	trademark_10_max9	Sum of all coded TRIPS-plus provisions on **trademark**	Formula: sum(variable7:variable15)	[0, 9]			Calculated	T+PTA
I_07	Index	geographical_indications_7	Sum of all coded TRIPS-plus provisions on **geographical indications**	Formula: sum(variable16:variable23)	[0, 7]			Calculated	T+PTA
I_08	Index	industrial_design_1	Sum of all coded TRIPS-plus provisions on **industrial design**	Formula: variable24	[0, 1]			Calculated	T+PTA
I_09	Index	patent_9	Sum of all coded TRIPS-plus provisions on **patent**	Formula: sum(variable25:variable33)	[0, 9]			Calculated	T+PTA
I_10	Index	undisclosed_information_7	Sum of all coded TRIPS-plus provisions on **undisclosed information**	Formula: sum(variable34:variable40)	[0, 7]			Calculated	T+PTA
I_11	Index	semiconductors_1	Sum of all coded TRIPS-plus provisions on **semiconductors**	Formula: variable41	[0, 1]			Calculated	T+PTA

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
I_12	Index	new_plant_varieties_1	Sum of all coded TRIPS-plus provisions on **new plant varieties**	Formula: sum(variable42:variable43)	[0, 1]			Calculated	T+PTA
I_13	Index	traditional_knowledge_genetic_resources_12_max6	Sum of all coded TRIPS-plus provisions on **traditional knowledge & genetic resources**	Formula: sum(variable44:variable55)	[0, 6]			Calculated	T+PTA
I_14	Index	encrypted_program-carrying_satellite_signals_1	Sum of all coded TRIPS-plus provisions on **encrypted program-carrying satellite signals**	Formula: variable56	[0, 1]			Calculated	T+PTA
I_15	Index	domain_names_1	Sum of all coded TRIPS-plus provisions on **domain names**	Formula: variable57	[0, 1]			Calculated	T+PTA
I_16	Index	copyright_weighed	Sum of all coded TRIPS-plus provisions on **copyright, weighed** by reachable maximum in category	Formula: I_05/5	[0, 1]			Calculated	T+PTA
I_17	Index	trademark_weighed	Sum of all coded TRIPS-plus provisions on **trademark, weighed** by reachable maximum in category	Formula: I_06/9	[0, 1]			Calculated	T+PTA
I_18	Index	geographical_indications_weighed	Sum of all coded TRIPS-plus provisions on **geographical indications, weighed** by reachable maximum in category	Formula: I_07/7	[0, 1]			Calculated	T+PTA

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	698		
I_19	Index	indus-trial_de-sign_weighed	Sum of all coded TRIPS-plus provisions on **industrial design, weighed** by reachable maximum in category	Formula: I_08	[0, 1]			Calculated	T+PTA
I_20	Index	pa-tent_weighed	Sum of all coded TRIPS-plus provisions on **patent, weighed** by reachable maximum in category	Formula: I_09/9	[0, 1]			Calculated	T+PTA
I_21	Index	undis-closed_in-for-mation_weighed	Sum of all coded TRIPS-plus provisions on **undisclosed information, weighed** by reachable maximum in category	Formula: I_10/7	[0, 1]			Calculated	T+PTA
I_22	Index	semiconduc-tors_weighed	Sum of all coded TRIPS-plus provisions on **semiconductors, weighed** by reachable maximum in category	Formula: I_11	[0, 1]			Calculated	T+PTA
I_23	Index	new_plant_vari-eties_weighed	Sum of all coded TRIPS-plus provisions on **new plant varieties, weighed** by reachable maximum in category	Formula: I_12/2	[0, 1]			Calculated	T+PTA
I_24	Index	tradi-tional_knowledge_ge-netic_re-sources_weighed	Sum of all coded TRIPS-plus provisions on **traditional knowledge & genetic resources, weighed** by reachable maximum in category	Formula: I_13/6	[0, 1]			Calculated	T+PTA
I_25	Index	en-crypted_pro-gram-carry-ing_satel-	Sum of all coded TRIPS-plus provisions on **encrypted program-carrying satellite signals, weighed** by reachable maximum in category	Formula: I_14	[0, 1]			Calculated	T+PTA

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	698		
		lite_sig-nals_weighed							
I_26	Index	do-main_names_weighed	Sum of all coded TRIPS-plus provisions on **domain names, weighed** by reachable maximum in category	Formula: I_15	[0, 1]			Calculated	T+PTA
I_27	Index	enforce-ment_27	Sum of all coded TRIPS-plus provisions on **enforcement**	Sum of TRIPS-plus provisions on enforcement Formula: sum(variable58:variable84)	[0, 27]			Calculated	T+PTA
I_28	Index	enforce-ment_weighed	Sum of all coded TRIPS-plus provisions on **enforcement, weighed**	Sum of TRIPS-plus provisions on enforcement, weighed by number of all enforcement provisions Formula: sum(variable58:variable84)/27	[0, 1]			Calculated	T+PTA
I_29	Index	enforce-ment_pa-tent_8	Sum of all coded TRIPS-plus provisions on **enforcement for patents** Note: variable80 (enforce-ment_restriction_of_insi-tutional_flexibility) and varia-ble81 (enforcement_bor-der_measures_importing_export-ing_transiting_goods) are not restricted to a specific IPR right and thus not included in this index.	Sum of TRIPS-plus provisions on enforcement for patents Formula: sum(variable58,61,64,67,70,73,76,77)	[0, 8]			Calculated	T+PTA

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
I_30	Index	enforce-ment_pa-tent_weighed	Sum of all coded TRIPS-plus provisions on **enforcement for patents, weighed**	Sum of TRIPS-plus provisions on enforcement for patents, weighed by number of enforcement variables for patents Formula: sum(variable58,61,64,67,70,73,76,77)/8	[0, 1]			Calculated	T+PTA
I_31	Index	enforce-ment_copy-right_9	Sum of all coded TRIPS-plus provisions on **enforcement for copyrights** Note: variable80 (enforce-ment_restriction_of_insi-tutional_flexibility) and variable81 (enforcement_bor-der_measures_importing_export-ing_transiting_goods) are not restricted to a specific IPR right and thus not included in this index.	Sum of TRIPS-plus provisions on enforcement for copyrights Formula: sum(variable59,62,65,68,71,74,78,82,84)	[0, 9]			Calculated	T+PTA
I_32	Index	enforce-ment_copy-right_weighed	Sum of all coded TRIPS-plus provisions on **enforcement for copyrights, weighed**	Sum of TRIPS-plus provisions on enforcement for copyrights, weighed by number of enforce-ment variables for copyrights Formula: sum(variable59,62,65,68,71,74,78,82,84)/9	[0, 1]			Calculated	T+PTA
I_33	Index	enforce-ment_trade-mark_8	Sum of all coded TRIPS-plus provisions on **enforcement for trademarks** Note: variable80 (enforce-ment_restriction_of_insi-tutional_flexibility) and variable81 (enforcement_bor-der_measures_importing_export-ing_transiting_goods) are not restricted to a specific IPR right and thus not included in this index.	Sum of TRIPS-plus provisions on enforcement for trademark Formula: sum(variable60,63,66,69,72,75,79,83)	[0, 8]			Calculated	T+PTA

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	698		
I_34	Index	enforce-ment_trade-mark_weighed	Sum of all coded TRIPS-plus provisions on **enforcement for trademarks, weighed**	Sum of TRIPS-plus provisions on enforcement for trademark, weighed by number of enforcement variables for trademark Formula: sum(variable60,63,66,69,72,75,79,83)/8	[0, 1]			Calculated	T+PTA
I_35	Index	exhaus-tion_6	Sum of all coded TRIPS-plus provisions on **exhaustion** Note: This excludes coded variables for 'free to decide' as this equals the TRIPS-plus standard and is not TRIPS-plus, and it excludes coded variables for 'international exhaustion' as this would be TRIPS-minus.	Sum of TRIPS-plus provisions on exhaustion Formula: sum(variable85,86,87,88,89,90)	[0, 6]			Calculated	T+PTA
I_36	Index	exhaustion_weighed	Sum of all coded TRIPS-plus provisions on **exhaustion, weighed** by reachable maximum in category and stringency of exhaustion regime	Sum of TRIPS-plus provisions on exhaustion, weighed by number of all exhaustion variables and stringency of exhaustion regime: National Exhaustion: 2/3 (strongest exhaustion mean) Regional Exhaustion: 1/3 Formula: sum(variable85,87,89)/3*2/3+sum(86,88,90)/3*1/3	[0, 1]			Calculated	T+PTA
I_37	Index	exhaustion_patents_2	Sum of all coded TRIPS-plus provisions on **exhaustion for patents** Note: This excludes coded variables for 'free to decide' as this equals the TRIPS-plus standard and is not TRIPS-plus, and it excludes coded variables for 'international exhaustion' as this would be TRIPS-minus.	Sum of TRIPS-plus provisions on exhaustion for patents Formula: sum(variable85,variable86)	[0, 2]			Calculated	T+PTA

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	698		
I_38	Index	exhaustion_ patents_ weighed	Sum of all coded TRIPS-plus provisions on **exhaustion for patents, weighed**	Sum of TRIPS-plus provisions on exhaustion for patents, weighed by number of exhaustion variables for patents and stringency of exhaustion regime: National Exhaustion: 2/3 (strongest exhaustion mean) Regional Exhaustion: 1/3 Formula: variable85*2/3 + variable86*1/3	[0, 1]			Calculated	T+PTA
I_39	Index	exhaustion_ copyright_2	Sum of all coded TRIPS-plus provisions on **exhaustion for copyrights** Note: This excludes coded variables for 'free to decide' as this equals the TRIPS-plus standard and is not TRIPS-plus, and it excludes coded variables for 'international exhaustion' as this would be TRIPS-minus.	Sum of TRIPS-plus provisions on exhaustion for copyrights Formula: sum(variable87:variable88)	[0, 2]			Calculated	T+PTA
I_40	Index	exhaustion_ copyright_ weighed	Sum of all coded TRIPS-plus provisions on **exhaustion for copyrights, weighed**	Sum of TRIPS-plus provisions on exhaustion for copyrights, weighed by number of exhaustion variables for copyrights and stringency of exhaustion regime: National Exhaustion: 2/3 (strongest exhaustion mean) Regional Exhaustion: 1/3 Formula: variable87*2/3 + variable88*1/3	[0, 1]			Calculated	T+PTA

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	698		
I_41	Index	exhaustion_ trademark_2	Sum of all coded TRIPS-plus provisions on **exhaustion for trademarks** Note: This excludes coded variables for 'free to decide' as this equals the TRIPS-plus standard and is not TRIPS-plus, and it excludes coded variables for 'international exhaustion' as this would be TRIPS-minus.	Sum of TRIPS-plus provisions on exhaustion for trademark Formula: sum(variable89:variable90)	[0, 2]			Calculated	T+PTA
I_42	Index	exhaustion_ trademark_ weighed	Sum of all coded TRIPS-plus provisions on **exhaustion for trademarks, weighed**	Sum of TRIPS-plus provisions on exhaustion for trademark, weighed by number of exhaustion variables for trademark and stringency of exhaustion regime: National Exhaustion: 2/3 (strongest exhaustion mean) Regional Exhaustion: 1/3 Formula: variable89*2/3 + variable90*1/3	[0, 1]			Calculated	T+PTA
I_43	Index	patent_ weighed_sub	Subindex for all TRIPS-plus variables on **patents, double weighed** by number of variables and importance to index overall	Patent variables on scope (25,26,28,31), duration (29), rights conferred (27,30,32,33) and exhaustion for patents (I_38) weighed by number of variables coded and subjective weight according to overall importance Scope: 1/4 Duration: 1/4 Rights Conferred: 1/4 Exhaustion: 1/4 Formula: =(variable25+26+28+31)/4*0.25+variable29*0.25+(variable27+30+32+33)/4*0.25+I_38*0.25	[0, 1]			Calculated	T+PTA

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	**698**		
I_44	Index	copyright_ weighed_sub	<u>Subindex</u> for all TRIPS-plus variables on **copyrights, double weighed** by number of variables and importance to index overall	Copyright variables on scope (3), duration (1,2: mutually exclusive), rights conferred (4,5,6) and exhaustion for copyrights (I_40) weighed by number of variables coded and subjective weight according to overall importance Scope: 1/4 Duration: 1/4 Rights Conferred: 1/4 Exhaustion: 1/4 Formula: =(variable3)*0.25+(variable2+3)*0.25+SUM(variable4:6)/3*0.25+I_40*0.25	[0, 1]			Calculated	T+PTA
I_45	Index	trademark_ weighed_sub	<u>Subindex</u> for all TRIPS-plus variables on **trademarks, double weighed** by number of variables and importance to index overall	Trademark variables on scope (7:12), duration (13), rights conferred (14,15) and exhaustion for trademarks (I_42) weighed by number of variables coded and subjective weight according to overall importance Scope: 1/4 Duration: 1/4 Rights Conferred: 1/4 Exhaustion: 1/4 Formula: =sum(variable7:12)/6*0.25+variable13*0.25)+(variable15+15)/2*0.25+I_42*0.25	[0, 1]			Calculated	T+PTA
I_46	Index	patent_ index_sum	Sum of all coded TRIPS-plus provisions on patent, including enforcement and exhaustion provisions for patents	Sum of indexes of patent variables: patent variables (I_09), patent enforcement (I_29) and patent exhaustion (I_37)	[0, 19]			Calculated	T+PTA

ID	Category	Variable	Description	Note	Range	Occurrence		Mode	Origin
						724	698		
I_47	Index	patent_ index_ weighed	Sum of all coded TRIPS-plus provisions on patent, including enforcement and exhaustion provisions for patents, weighed	Sum of weighed indexes of patent variables: patent variables (I_20), patent enforcement (I_30) and patent exhaustion (I_38)	[0, 1]			Calculated	T+PTA
I_48	Index	copyright_ index_sum	Sum of all coded TRIPS-plus provisions on copyright, including enforcement and exhaustion provisions for copyrights	Sum of indexes of copyright variables: copyright variables (I_05), copyright enforcement (I_31) and copyright exhaustion (I_39)	[0, 16]			Calculated	T+PTA
I_49	Index	copyright_ index_ weighed	Sum of all coded TRIPS-plus provisions on copyright, including enforcement and exhaustion provisions for copyrights, weighed	Sum of weighed indexes of copyright variables: copyright variables (I_16), copyright enforcement (I_32) and copyright exhaustion (I_40)	[0, 1]			Calculated	T+PTA
I_50	Index	trademark_ index_sum	Sum of all coded TRIPS-plus provisions on trademarks, including enforcement and exhaustion provisions for trademarks	Sum of indexes of trademark variables: trademark variables (I_06), trademark enforcement (I_33) and trademark exhaustion (I_41)	[0, 19]			Calculated	T+PTA
I_51	Index	trademark_ index_ weighed	Sum of all coded TRIPS-plus provisions on trademarks, including enforcement and exhaustion provisions for trademarks, weighed	Sum of weighed indexes of trademark variables: trademark variables (I_17), trademark enforcement (I_34) and trademark exhaustion (I_42)	[0, 1]			Calculated	T+PTA

Appendix 4: Cohen's Kappa for 2 Coders (Weights: unweighted) – IRR

	IPRs in PTAs dataset	T+PTA dataset
Subjects	62264	12192
z	355	97.3
p-value	0	0
Cohen's Kappa	**0.945**	**0.881**

Appendix 5: Descriptive Statistics – Detailed Coding Profile US

US PTAs	**year_signature**	**ipr_general_sum**	**ipr_specific_sum**	**ipr_general_enforcement_sum**	**ipr_specific_enforcement_sum**	**ipr_scope_mentioned_sum**	**ipr_scope_tangible_sum**	**ipr_multilateral_coherence_dummy_sum**	**ipr_tripsplus_per_pta**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Canada US Automotive Products Trade Agreement (APTA)	1965	0	0	0	0	0	0	0	0	0	0
Israel US	1985	9	0	1	0	3	0	8	0	0	0
Canada US	1988	8	0	0	0	5	0	0	0	0	0
North American Free Trade Agreement (NAFTA)	1992	16	12	2	4	9	8	4	22	10	0
US Vietnam	2000	19	11	3	4	8	7	7	24	14	0
Jordan US	2000	11	7	3	3	4	4	10	17	11	0
Singapore US	2003	18	11	5	5	6	6	14	27	15	0
Chile US	2003	20	12	6	6	6	6	17	31	16	0
Laos US	2003	15	12	3	5	8	7	7	25	14	0
Australia US	2004	21	14	5	6	8	8	14	37	17	2
Central American Free Trade Agreement (CAFTA)	2004	19	13	4	7	7	6	18	33	17	0
Morocco US	2004	19	12	6	6	6	6	18	39	20	0
Central American Free Trade Agreement (CAFTA) Dominican Republic	2004	19	13	4	7	7	6	17	34	17	0
Bahrain US	2004	14	12	4	6	6	6	16	35	17	0

US PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coherence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
Oman US	2006	18	12	5	6	6	6	17	35	18	0
Peru US	2006	19	12	5	6	6	6	19	36	19	0
Colombia US	2006	19	12	5	6	6	6	18	34	17	0
Panama US	2007	21	12	6	6	7	6	19	35	18	0
Korea US	2007	20	12	6	6	6	6	19	33	16	0
Korea US environmental side agreement	2012	10	2	1	0	5	2	1	0	0	0
Panama US environmental side agreement	2012	4	1	0	0	1	1	0	0	0	0
Colombia US environmental side agreement	2013	4	1	0	0	1	1	0	0	0	0
Trans-Pacific Partnership (TPP)	2016	24	15	5	6	11	9	17	42	21	0
US PTAs	**Total**	**347**	**208**	**79**	**95**	**132**	**113**	**260**	**539**	**277**	**2**

Appendix 6: Descriptive Statistics – Detailed Coding Profile EU

EU PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coher-ence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
EC	1957	0	0	0	0	0	0	0	0	0	0
EC Greece Association Agreement	1961	0	0	0	0	0	0	0	0	0	0
EC Turkey Association Agreement (Ankara Agreement)	1963	0	0	0	0	0	0	0	0	0	0
EC Tunisia Association Agreement	1969	0	0	0	0	0	0	0	0	0	0
EC Morocco Association Agreement	1969	0	0	0	0	0	0	0	0	0	0
EC Israel	1970	0	0	0	0	0	0	0	0	0	0
EC Spain	1970	0	0	0	0	0	0	0	0	0	0
EC Turkey Additional Protocol	1970	0	0	0	0	0	0	0	0	0	0
EC Malta	1970	0	0	0	0	0	0	0	0	0	0
EC (9) Enlargement	1972	0	0	0	0	0	0	0	0	0	0
Austria EC	1972	0	0	0	0	0	0	0	0	0	0
EC Iceland	1972	0	0	0	0	0	0	0	0	0	0
EC Switzerland Liechtenstein	1972	0	0	0	0	0	0	0	0	0	0
EC Egypt Agreement	1972	0	0	0	0	0	0	0	0	0	0

EU PTAs	**year_signature**	**ipr_general_sum**	**ipr_specific_sum**	**ipr_general_enforcement_sum**	**ipr_specific_enforcement_sum**	**ipr_scope_mentioned_sum**	**ipr_scope_tangible_sum**	**ipr_multilateral_coher-ence_dummy_sum**	**ipr_tripsplus_per_pta**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
EC Lebanon	1972	0	0	0	0	0	0	0	0	0	0
Cyprus EC	1972	0	0	0	0	0	0	0	0	0	0
EC Sweden	1972	0	0	0	0	0	0	0	0	0	0
EC Portugal	1972	0	0	0	0	0	0	0	0	0	0
EC Norway	1973	0	0	0	0	0	0	0	0	0	0
EC Turkey Supplementary Protocol	1973	0	0	0	0	0	0	0	0	0	0
EC Finland	1973	0	0	0	0	0	0	0	0	0	0
EC Greece Additional Protocol	1975	0	0	0	0	0	0	0	0	0	0
EC Israel	1975	0	0	0	0	0	0	0	0	0	0
EC Tunisia	1976	0	0	0	0	0	0	0	0	0	0
Algeria EC	1976	0	0	0	0	0	0	0	0	0	0
EC Morocco	1976	0	0	0	0	0	0	0	0	0	0
EC Portugal Additional Protocol	1976	0	0	0	0	0	0	0	0	0	0
EC Egypt	1977	0	0	0	0	0	0	0	0	0	0
EC Jordan	1977	0	0	0	0	0	0	0	0	0	0

EU PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coherence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
EC Syria	1977	2	0	0	0	0	0	0	0	0	0
EC Lebanon	1977	0	0	0	0	0	0	0	0	0	0
EC (10) Enlargement	1979	0	0	0	0	0	0	0	0	0	0
EC Yugoslavia	1980	0	0	0	0	0	0	0	0	0	0
EC (12) Enlargement	1985	0	0	0	0	0	0	0	0	0	0
EC Single European Act	1986	0	0	0	0	0	0	0	0	0	0
Andorra EC	1990	0	0	0	0	0	0	0	0	0	0
EC Faroe Islands	1991	0	0	0	0	0	0	0	0	0	0
EC San Marino	1991	2	0	0	0	0	0	0	0	0	0
EC Hungary	1991	11	0	0	0	7	0	9	0	0	0
EC Poland	1991	4	0	0	0	0	0	9	0	0	0
European Economic Area (EEA)	1992	12	10	2	4	6	6	9	10	0	3
EC Maastricht	1992	0	0	0	0	0	0	0	0	0	0
EC Romania	1993	13	0	1	0	7	0	9	0	0	0
Bulgaria EC	1993	12	0	1	0	7	0	9	0	0	0

EU PTAs	**year_signature**	**ipr_general_sum**	**ipr_specific_sum**	**ipr_general_enforcement_sum**	**ipr_specific_enforcement_sum**	**ipr_scope_mentioned_sum**	**ipr_scope_tangible_sum**	**ipr_multilateral_coher-ence_dummy_sum**	**ipr_tripsplus_per_pta**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
EC Slovakia	1993	12	0	1	0	7	0	9	0	0	0
EC Slovenia	1993	2	0	0	0	0	0	0	0	0	0
Czech Republic EC	1993	10	0	0	0	7	0	9	0	0	0
EC Latvia	1994	1	0	0	0	0	0	0	0	0	0
EC Maastricht (15) Enlargement	1994	5	2	0	0	2	2	0	0	0	0
EC Estonia	1994	2	0	0	0	0	0	0	0	0	0
EC Lithuania	1994	1	0	0	0	0	0	0	0	0	0
EC Estonia Europe Agreement	1995	7	0	2	0	0	0	9	0	0	0
EC Latvia Europe Agreement	1995	13	0	2	0	7	0	9	0	0	0
EC Lithuania Europe Agreement	1995	14	0	2	0	7	0	9	0	0	0
EC Tunisia Euro-Med Association Agreement	1995	13	0	2	0	7	0	7	0	0	0
EC Israel Euro-Med Association Agreement	1995	4	0	1	0	0	0	9	0	0	0
EC Turkey	1995	16	9	3	4	9	5	9	7	2	0
EC Morocco Euro-Med Association Agreement	1996	6	0	2	0	0	0	9	0	0	0
EC Slovenia Europe Agreement	1996	7	0	2	0	0	0	9	0	0	0

EU PTAs	**year_signature**	**ipr_general_sum**	**ipr_specific_sum**	**ipr_general_enforcement_sum**	**ipr_specific_enforcement_sum**	**ipr_scope_mentioned_sum**	**ipr_scope_tangible_sum**	**ipr_multilateral_coherence_dummy_sum**	**ipr_tripsplus_per_pta**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
EC Faroe Islands	1996	0	0	0	0	0	0	0	0	0	0
EC Amsterdam	1997	1	0	0	0	0	0	0	0	0	0
EC Jordan Euro-Med Association Agreement	1997	6	0	2	0	0	0	10	0	0	0
EC Switzerland Bilaterals I	1999	8	2	2	0	2	2	3	3	0	0
EC South Africa	1999	12	0	1	0	7	0	10	0	0	0
EC Mexico	2000	12	0	1	0	7	0	1	0	0	0
Cotonou Agreement	2000	13	0	1	0	8	0	4	0	0	0
EC Nice	2001	1	0	0	0	0	0	0	0	0	0
EC North Macedonia SAA	2001	14	0	2	0	7	0	10	0	0	0
EC Egypt Euro-Med Association Agreement	2001	13	0	2	0	7	0	10	0	0	0
Croatia EC	2001	14	0	2	0	7	0	10	0	0	0
Algeria EC Euro-Med Association Agreement	2002	13	0	2	0	7	0	13	0	0	0
EC Lebanon Euro-Med Association Agreement	2002	13	0	2	0	7	0	11	0	0	0
Chile EC	2002	13	2	2	0	7	2	17	0	0	0
EC Nice (25) Enlargement	2003	3	0	0	0	0	0	0	0	0	0

EU PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coherence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
EC Nice (27) Enlargement	2005	10	5	1	0	6	5	0	6	0	0
Albania EC SAA	2006	15	3	2	1	8	2	15	2	0	0
EC Montenegro SAA	2007	16	4	3	2	8	2	22	9	1	0
EC Lisbon	2007	5	0	1	0	0	0	0	0	0	0
EC Serbia SAA	2008	15	5	2	3	8	2	22	21	13	0
Bosnia and Herzegovina EC SAA	2008	14	3	1	2	8	1	22	25	16	0
CARIFORUM EC EPA	2008	16	10	3	3	9	7	16	23	18	0
Cote d'Ivoire EC EPA	2008	3	0	0	0	0	0	1	0	0	0
EC Korea	2010	16	12	3	6	9	6	14	30	17	0
Colombia Peru EC	2012	18	14	3	7	9	7	18	37	17	0
Central America EC	2012	19	11	4	6	9	5	15	30	18	0
EC Georgia	2014	14	11	3	6	7	5	15	38	17	6
EC Moldova	2014	14	11	3	6	7	5	18	38	17	6
EC Ukraine	2014	16	13	3	7	9	6	11	33	14	0
EC West African States EPA	2014	2	0	0	0	0	0	1	0	0	0

EU PTAs	**year_signature**	**ipr_general_sum**	**ipr_specific_sum**	**ipr_general_enforcement_sum**	**ipr_specific_enforcement_sum**	**ipr_scope_mentioned_sum**	**ipr_scope_tangible_sum**	**ipr_multilateral_coherence_dummy_sum**	**ipr_tripsplus_per_pta**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
EC Kosovo SAA	2015	9	2	2	0	2	2	22	9	1	0
EC Vietnam	2016	21	13	5	7	8	6	18	34	20	0
EC South African Development Community (SADC) EPA	2016	9	2	1	1	4	1	2	6	0	0
Canada EC (CETA)	2016	20	9	5	4	8	5	12	27	15	0
Armenia EC	2017	16	12	4	6	8	6	19	39	16	6
EC Singapore	2018	17	9	5	4	8	5	15	28	15	0
EU PTAs	**Total**	**590**	**174**	**94**	**79**	**274**	**95**	**510**	**455**	**217**	**21**

Appendix 7: Descriptive Statistics – Detailed Coding Profile EFTA

EFTA PTAs	**year_signature**	**ipr_general_sum**	**ipr_specific_sum**	**ipr_general_enforcement_sum**	**ipr_specific_enforcement_sum**	**ipr_scope_mentioned_sum**	**ipr_scope_tangible_sum**	**ipr_multilateral_coher-ence_dummy_sum**	**ipr_tripsplus_per_pta**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
EFTA	1960	0	0	0	0	0	0	0	0	0	0
EFTA Finland	1961	0	0	0	0	0	0	0	0	0	0
EFTA Spain	1979	0	0	0	0	0	0	0	0	0	0
EFTA Turkey	1991	17	7	3	5	8	2	9	4	0	0
Czech and Slovak Republic EFTA	1992	5	0	1	0	0	0	0	0	0	0
EFTA Israel	1992	14	3	2	2	7	1	3	6	3	0
EFTA Poland	1992	13	0	1	0	7	0	5	0	0	0
EFTA Romania	1992	6	0	1	0	0	0	0	0	0	0
Central European Free Trade Agreement (CEFTA)	1992	12	0	1	0	7	0	5	0	0	0
Bulgaria EFTA	1993	13	4	1	2	7	2	5	6	3	0
EFTA Hungary	1993	3	0	1	0	0	0	0	0	0	0
EFTA Estonia	1995	14	6	2	4	7	2	7	3	0	0
EFTA Latvia	1995	14	6	2	4	7	2	6	3	0	0
EFTA Lithuania	1995	14	6	2	4	7	2	7	3	0	0

EFTA PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coherence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
EFTA Slovenia	1995	16	5	2	4	8	1	8	4	0	0
EFTA Morocco	1997	16	5	2	4	8	1	10	4	0	0
EFTA North Macedonia	2000	16	6	2	4	8	2	8	4	0	0
EFTA Mexico	2000	16	6	2	5	8	1	10	4	0	0
Croatia EFTA	2001	16	6	2	4	8	2	8	4	0	0
EFTA Jordan	2001	16	5	2	4	8	1	10	4	0	0
EFTA services	2001	15	6	2	4	8	2	9	4	0	0
EFTA Singapore	2002	20	8	3	5	8	3	7	4	0	0
Chile EFTA	2003	15	9	2	5	8	4	14	4	0	0
EFTA Lebanon	2004	16	7	2	4	8	3	15	5	0	0
EFTA Tunisia	2004	16	7	2	4	8	3	16	3	0	0
EFTA Korea	2005	16	10	2	5	8	5	8	6	0	0
EFTA Southern African Customs Union (SACU)	2006	15	0	1	0	8	0	2	0	0	0
Central European Free Trade Agreement (CEFTA)	2006	13	0	2	0	7	0	24	0	0	0
EFTA Egypt	2007	17	6	3	4	8	2	9	4	0	0

EFTA PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coherence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
Canada EFTA	2008	0	0	0	0	0	0	0	0	0	0
Colombia EFTA	2008	16	11	3	4	7	7	15	12	0	0
EFTA GCC	2009	14	1	1	1	8	0	1	0	0	0
Albania EFTA	2009	16	8	2	3	8	5	10	8	1	0
EFTA Serbia	2009	16	10	2	5	8	5	10	9	1	0
EFTA Ukraine	2010	19	10	2	5	8	5	13	9	1	0
EFTA Peru	2010	15	10	2	4	7	6	16	11	1	0
EFTA Hong Kong	2011	16	9	2	2	8	7	12	8	1	0
EFTA Montenegro	2011	16	10	2	4	8	6	13	18	7	0
Bosnia and Herzegovina EFTA	2013	16	10	2	4	8	6	14	18	7	0
Central America EFTA	2013	17	9	2	4	9	5	16	12	4	0
EFTA Philippines	2016	16	13	2	5	8	8	15	18	7	0
EFTA Georgia	2016	17	11	1	5	10	6	16	16	8	0
EFTA PTAs	**Total**	**558**	**230**	**71**	**123**	**273**	**107**	**356**	**218**	**44**	**0**

Appendix 8: Descriptive Statistics – Detailed Coding Profile Japan

Japan PTAs	**year_signature**	**ipr_general_sum**	**ipr_specific_sum**	**ipr_general_enforcement_sum**	**ipr_specific_enforcement_sum**	**ipr_scope_mentioned_sum**	**ipr_scope_tangible_sum**	**ipr_multilateral_coherence_dummy_sum**	**ipr_tripsplus_per_pta**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Japan Singapore	2002	15	1	2	1	7	0	1	0	0	0
Japan Mexico	2004	5	1	0	0	1	1	16	2	0	0
Japan Malaysia	2005	20	11	3	5	8	6	7	7	6	0
Japan Philippines	2006	18	6	3	4	8	2	11	8	7	0
Chile Japan	2007	20	7	5	5	8	2	13	8	6	0
Japan Thailand	2007	21	12	4	5	8	7	7	14	10	0
Brunei Japan	2007	13	0	3	0	4	0	2	0	0	0
Indonesia Japan	2007	20	10	3	5	8	5	14	8	7	0
Association of Southeast Asian Nations Japan	2008	3	0	0	0	0	0	0	0	0	0
Japan Vietnam	2008	16	10	3	5	7	5	10	7	6	0
Japan Switzerland	2009	21	12	4	6	8	6	23	25	11	0
India Japan	2011	17	2	3	0	7	2	3	0	0	0

Japan PTAs	**year_signature**	**ipr_general_sum**	**ipr_specific_sum**	**ipr_general_enforcement_sum**	**ipr_specific_enforcement_sum**	**ipr_scope_mentioned_sum**	**ipr_scope_tangible_sum**	**ipr_multilateral_coher-ence_dummy_sum**	**ipr_tripsplus_per_pta**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Japan Peru	2011	16	12	3	7	7	5	17	8	7	0
Australia Japan	2014	19	11	3	6	8	5	18	16	12	0
Japan Mongolia	2015	18	10	3	5	7	5	13	5	5	0
Trans-Pacific Partnership (TPP)	2016	24	15	5	6	11	9	17	42	21	0
Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)	2018	24	15	5	6	11	9	17	35	21	0
Japan PTAs	**Total**	**290**	**135**	**52**	**66**	**118**	**69**	**189**	**185**	**119**	**0**

Appendix 9: Descriptive Statistics – Detailed Coding Profile Brazil

Brazil PTAs	**year_signature**	**ipr_general_sum**	**ipr_specific_sum**	**ipr_general_enforcement_sum**	**ipr_specific_enforcement_sum**	**ipr_scope_mentioned_sum**	**ipr_scope_tangible_sum**	**ipr_multilateral_coher-ence_dummy_sum**	**ipr_tripsplus_per_pta**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Latin American Free Trade Area (LAFTA)	1960	0	0	0	0	0	0	0	0	0	0
Protocol on Trade Negotiations (PTN)	1971	0	0	0	0	0	0	0	0	0	0
Latin American Integration Association (ALADI LAIA)	1980	0	0	0	0	0	0	0	0	0	0
Brazil Uruguay	1982	0	0	0	0	0	0	0	0	0	0
Argentina Brazil	1986	0	0	0	0	0	0	0	0	0	0
Brazil Uruguay	1986	0	0	0	0	0	0	0	0	0	0
Global System of Trade Preferences (GSTP)	1988	0	0	0	0	0	0	0	0	0	0
Argentina Brazil	1988	0	0	0	0	0	0	0	0	0	0
Brazil Cuba	1989	0	0	0	0	0	0	0	0	0	0
Argentina Brazil	1990	0	0	0	0	0	0	0	0	0	0
MERCOSUR	1991	0	0	0	0	0	0	0	0	0	0
Brazil Peru	1993	2	0	0	0	0	0	7	0	0	0
Chile MERCOSUR	1996	2	0	0	0	0	0	1	0	0	0
Bolivia MERCOSUR	1996	0	0	0	0	0	0	0	0	0	0

Brazil PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coherence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
MERCOSUR services	1997	0	0	0	0	0	0	0	0	0	0
Andean Community Brazil	1999	0	0	0	0	0	0	0	0	0	0
Brazil Cuba	1999	0	0	0	0	0	0	0	0	0	0
Brazil Guyana	2001	0	0	0	0	0	0	0	0	0	0
Brazil Mexico	2002	0	0	0	0	0	0	0	0	0	0
MERCOSUR Mexico Auto Agreement	2002	0	0	0	0	0	0	0	0	0	0
India MERCOSUR	2004	0	0	0	0	0	0	0	0	0	0
Andean Countries MERCOSUR	2004	3	0	0	0	1	0	2	0	0	0
MERCOSUR Southern African Customs Union (SACU)	2004	0	0	0	0	0	0	0	0	0	0
Brazil Suriname	2005	0	0	0	0	0	0	0	0	0	0
MERCOSUR Peru	2005	3	0	0	0	1	0	2	0	0	0
Cuba MERCOSUR	2006	0	0	0	0	0	0	0	0	0	0
Israel MERCOSUR	2007	0	0	0	0	0	0	0	0	0	0
MERCOSUR Southern African Customs Union (SACU)	2008	0	0	0	0	0	0	0	0	0	0
Chile MERCOSUR Protocol on Services	2009	0	0	0	0	0	0	0	0	0	0

Brazil PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coherence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
Egypt MERCOSUR	2010	0	0	0	0	0	0	0	0	0	0
Brazil PTAs	Total	10	0	0	0	2	0	12	0	0	0

Appendix 10: Descriptive Statistics – Detailed Coding Profile China

China PTAs	**year_signature**	**ipr_general_sum**	**ipr_specific_sum**	**ipr_general_enforcement_sum**	**ipr_specific_enforcement_sum**	**ipr_scope_mentioned_sum**	**ipr_scope_tangible_sum**	**ipr_multilateral_coherence_dummy_sum**	**ipr_tripsplus_per_pta**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
China Hong Kong	2003	0	0	0	0	0	0	0	0	0	0
China Macao	2003	0	0	0	0	0	0	0	0	0	0
Association of Southeast Asian Nations China	2004	2	0	0	0	0	0	0	0	0	0
Asia Pacific Trade Agreement (Bangkok Agreement amended)	2005	0	0	0	0	0	0	0	0	0	0
Chile China	2005	12	2	2	1	3	1	9	6	3	0
China Pakistan	2006	9	1	2	1	3	0	1	3	3	0
Association of Southeast Asian Nations China Services	2007	0	0	0	0	0	0	0	0	0	0
China New Zealand	2008	18	0	3	0	8	0	9	0	0	0
China Singapore	2008	0	0	0	0	0	0	0	0	0	0
China Pakistan Services	2009	0	0	0	0	0	0	0	0	0	0
China Peru	2009	15	4	3	2	5	2	12	6	3	0
China Costa Rica	2010	8	4	2	2	2	2	14	7	3	0
China Iceland	2013	12	1	0	1	8	0	7	0	0	0
China Switzerland	2013	17	13	2	5	9	8	21	21	7	0

China PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coherence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
China Korea	2015	22	12	5	6	9	6	21	23	14	0
Australia China	2015	21	8	4	5	9	3	18	5	2	0
China Georgia	2017	15	7	2	2	9	5	14	2	0	0
China PTAs	**Total**	**151**	**52**	**25**	**25**	**65**	**27**	**126**	**73**	**35**	**0**

Appendix 11: Descriptive Statistics – Detailed Coding Profile India

India PTAs	**year_signature**	**ipr_general_sum**	**ipr_specific_sum**	**ipr_general_enforcement_sum**	**ipr_specific_enforcement_sum**	**ipr_scope_mentioned_sum**	**ipr_scope_tangible_sum**	**ipr_multilateral_coher-ence_dummy_sum**	**ipr_tripsplus_per_pta**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Tripartite Agreement	1967	0	0	0	0	0	0	0	0	0	0
Protocol on Trade Negotiations (PTN)	1971	0	0	0	0	0	0	0	0	0	0
Bhutan India	1972	0	0	0	0	0	0	0	0	0	0
Bangkok Agreement	1975	0	0	0	0	0	0	0	0	0	0
Global System of Trade Preferences (GSTP)	1988	0	0	0	0	0	0	0	0	0	0
India Nepal	1991	0	0	0	0	0	0	0	0	0	0
South Asian Association for Regional Cooperation, Preferential Trading Arrangement (SAPTA)	1993	0	0	0	0	0	0	0	0	0	0
India Sri Lanka	1998	0	0	0	0	0	0	0	0	0	0
Afghanistan India	2003	0	0	0	0	0	0	0	0	0	0
India MERCOSUR	2004	0	0	0	0	0	0	0	0	0	0
South Asian Free Trade Area (SAFTA)	2004	0	0	0	0	0	0	0	0	0	0
India Singapore	2005	9	0	2	0	1	0	0	0	0	0
Asia Pacific Trade Agreement (Bangkok Agreement amended)	2005	0	0	0	0	0	0	0	0	0	0
Chile India	2006	0	0	0	0	0	0	0	0	0	0

India PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coherence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
Bhutan India	2006	0	0	0	0	0	0	0	0	0	0
India Korea	2009	10	4	4	4	0	0	3	0	0	0
Association of Southeast Asian Nations India	2009	0	0	0	0	0	0	0	0	0	0
India Nepal	2009	0	0	0	0	0	0	0	0	0	0
India Japan	2011	17	2	3	0	7	2	3	0	0	0
India Malaysia	2011	8	1	4	1	0	0	1	0	0	0
India PTAs	**Total**	**44**	**7**	**13**	**5**	**8**	**2**	**7**	**0**	**0**	**0**

Appendix 12: Descriptive Statistics – Detailed Coding Profile Mexico

Mexico PTAs	**year_signature**	**ipr_general_sum**	**ipr_specific_sum**	**ipr_general_enforcement_sum**	**ipr_specific_enforcement_sum**	**ipr_scope_mentioned_sum**	**ipr_scope_tangible_sum**	**ipr_multilateral_coherence_dummy_sum**	**ipr_tripsplus_per_pta**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Latin American Free Trade Area (LAFTA)	1960	0	0	0	0	0	0	0	0	0	0
Protocol on Trade Negotiations (PTN)	1971	0	0	0	0	0	0	0	0	0	0
Latin American Integration Association (ALADI LAIA)	1980	0	0	0	0	0	0	0	0	0	0
Costa Rica Mexico	1982	0	0	0	0	0	0	0	0	0	0
Honduras Mexico	1985	0	0	0	0	0	0	0	0	0	0
Guatemala Mexico	1985	0	0	0	0	0	0	0	0	0	0
Cuba Mexico	1985	0	0	0	0	0	0	0	0	0	0
El Salvador Mexico	1986	0	0	0	0	0	0	0	0	0	0
Argentina Mexico	1986	0	0	0	0	0	0	0	0	0	0
Mexico Peru	1987	0	0	0	0	0	0	0	0	0	0
Global System of Trade Preferences (GSTP)	1988	0	0	0	0	0	0	0	0	0	0
Chile Mexico	1991	0	0	0	0	0	0	0	0	0	0
North American Free Trade Agreement (NAFTA)	1992	16	12	2	4	9	8	4	22	10	0
Ecuador Mexico	1993	0	0	0	0	0	0	0	0	0	0

Mexico PTAs	**year_signature**	**ipr_general_sum**	**ipr_specific_sum**	**ipr_general_enforcement_sum**	**ipr_specific_enforcement_sum**	**ipr_scope_mentioned_sum**	**ipr_scope_tangible_sum**	**ipr_multilateral_coherence_dummy_sum**	**ipr_tripsplus_per_pta**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Costa Rica Mexico	1994	20	9	4	4	7	5	5	16	9	0
Group of Three	1994	13	8	2	3	6	5	6	16	9	0
Association of Caribbean States	1994	0	0	0	0	0	0	0	0	0	0
Bolivia Mexico	1994	17	11	2	4	9	7	7	19	10	0
Chile Mexico	1998	13	7	4	4	3	3	5	14	12	0
Guatemala Mexico	1999	0	0	0	0	0	0	0	0	0	0
EC Mexico	2000	12	0	1	0	7	0	1	0	0	0
Israel Mexico	2000	5	2	1	1	1	1	1	0	0	0
Cuba Mexico	2000	0	0	0	0	0	0	0	0	0	0
EFTA Mexico	2000	16	6	2	5	8	1	10	4	0	0
Brazil Mexico	2002	0	0	0	0	0	0	0	0	0	0
MERCOSUR Mexico Auto Agreement	2002	0	0	0	0	0	0	0	0	0	0
Mexico Uruguay	2003	21	11	4	4	8	7	9	17	11	0
Japan Mexico	2004	5	1	0	0	1	1	16	2	0	0
Group of Three Auto Agreement	2004	0	0	0	0	0	0	0	0	0	0

Mexico PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coherence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
Pacific Alliance	2012	7	0	2	0	0	0	0	0	0	0
Mexico Panama	2014	17	7	4	4	4	3	19	10	1	0
Trans-Pacific Partnership (TPP)	2016	24	15	5	6	11	9	17	42	21	0
Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)	2018	24	15	5	6	11	9	17	35	21	0
Mexico PTAs	**Total**	**210**	**104**	**38**	**45**	**85**	**59**	**117**	**197**	**104**	**0**

Appendix 13: Descriptive Statistics – Detailed Coding Profile Israel

Israel PTAs	**year_signature**	**ipr_general_sum**	**ipr_specific_sum**	**ipr_general_enforcement_sum**	**ipr_specific_enforcement_sum**	**ipr_scope_mentioned_sum**	**ipr_scope_tangible_sum**	**ipr_multilateral_coherence_dummy_sum**	**ipr_tripsplus_per_pta**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
EC Israel	1970	0	0	0	0	0	0	0	0	0	0
Protocol on Trade Negotiations (PTN)	1971	0	0	0	0	0	0	0	0	0	0
EC Israel	1975	0	0	0	0	0	0	0	0	0	0
Israel US	1985	9	0	1	0	3	0	8	0	0	0
EFTA Israel	1992	14	3	2	2	7	1	3	6	3	0
Israel PLO	1994	0	0	0	0	0	0	1	0	0	0
Israel Jordan	1995	3	0	0	0	1	0	1	0	0	0
EC Israel Euro-Med Association Agreement	1995	4	0	1	0	0	0	9	0	0	0
Israel Turkey	1996	5	0	2	0	0	0	0	0	0	0
Czech Republic Israel	1996	13	0	1	0	8	0	1	0	0	0
Canada Israel	1996	2	0	0	0	0	0	1	0	0	0
Israel Slovakia	1996	13	0	1	0	8	0	1	0	0	0
Israel Poland	1997	13	0	1	0	8	0	1	0	0	0
Hungary Israel	1997	13	0	1	0	8	0	1	0	0	0

Israel PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coherence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
Israel Slovenia	1998	13	0	1	0	8	0	1	0	0	0
Israel Mexico	2000	5	2	1	1	1	1	1	0	0	0
Israel Romania	2001	12	0	1	0	7	0	2	0	0	0
Bulgaria Israel	2001	13	0	2	0	7	0	2	0	0	0
Israel MERCOSUR	2007	0	0	0	0	0	0	0	0	0	0
Colombia Israel	2013	14	0	2	0	8	0	1	0	0	0
Israel PTAs	**Total**	**146**	**5**	**17**	**3**	**74**	**2**	**34**	**6**	**3**	**0**

Appendix 14: Descriptive Statistics – Detailed Coding Profile South Korea

South Korea PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coherence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
Protocol on Trade Negotiations (PTN)	1971	0	0	0	0	0	0	0	0	0	0
Bangkok Agreement	1975	0	0	0	0	0	0	0	0	0	0
Global System of Trade Preferences (GSTP)	1988	0	0	0	0	0	0	0	0	0	0
Chile Korea	2003	13	6	5	4	2	2	4	3	0	0
Korea Singapore	2005	17	1	4	1	7	0	3	0	0	0
Asia Pacific Trade Agreement (Bangkok Agreement amended)	2005	0	0	0	0	0	0	0	0	0	0
EFTA Korea	2005	16	10	2	5	8	5	8	6	0	0
Association of Southeast Asian Nations Korea	2006	2	0	0	0	0	0	1	0	0	0
Korea US	2007	20	12	6	6	6	6	19	33	16	0
Association of Southeast Asian Nations Korea services	2007	0	0	0	0	0	0	0	0	0	0
India Korea	2009	10	4	4	4	0	0	3	0	0	0
EC Korea	2010	16	12	3	6	9	6	14	30	17	0
Korea Peru	2011	15	7	4	4	3	3	17	7	3	0
Korea US environmental side agreement	2012	10	2	1	0	5	2	1	0	0	0

South Korea PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coherence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
Korea Turkey	2012	15	8	3	5	8	3	18	8	1	0
Colombia Korea	2013	16	8	4	4	4	4	18	11	4	0
Australia Korea	2014	19	11	6	7	5	4	24	25	14	0
Canada Korea	2014	21	10	5	5	8	5	14	26	14	0
Korea New Zealand	2015	21	3	4	1	9	2	12	7	1	0
Korea Vietnam	2015	21	9	5	5	8	4	13	13	9	0
China Korea	2015	22	12	5	6	9	6	21	23	14	0
South Korea PTAs	**Total**	**254**	**115**	**61**	**63**	**91**	**52**	**190**	**192**	**93**	**0**

Appendix 15: Descriptive Statistics – Detailed Coding Profile Singapore

Singapore PTAs	**year_signature**	**ipr_general_sum**	**ipr_specific_sum**	**ipr_general_enforcement_sum**	**ipr_specific_enforcement_sum**	**ipr_scope_mentioned_sum**	**ipr_scope_tangible_sum**	**ipr_multilateral_coherence_dummy_sum**	**ipr_tripsplus_per_pta**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Association of Southeast Asian Nations (ASEAN) Preferential Trading Arrangements (PTA)	1977	0	0	0	0	0	0	0	0	0	0
Global System of Trade Preferences (GSTP)	1988	0	0	0	0	0	0	0	0	0	0
Association of Southeast Asian Nations (ASEAN) FTA	1992	0	0	0	0	0	0	0	0	0	0
Association of Southeast Asian Nations Services	1995	0	0	0	0	0	0	0	0	0	0
New Zealand Singapore	2000	6	0	1	0	0	0	1	0	0	0
Japan Singapore	2002	15	1	2	1	7	0	1	0	0	0
EFTA Singapore	2002	20	8	3	5	8	3	7	4	0	0
Australia Singapore	2003	19	1	4	0	9	1	5	1	1	0
Singapore US	2003	18	11	5	5	6	6	14	27	15	0
Jordan Singapore	2004	2	0	0	0	0	0	1	0	0	0
Association of Southeast Asian Nations China	2004	2	0	0	0	0	0	0	0	0	0
India Singapore	2005	9	0	2	0	1	0	0	0	0	0
Trans-Pacific Strategic EPA (TPSEP)	2005	13	1	1	0	8	1	6	2	0	0
Korea Singapore	2005	17	1	4	1	7	0	3	0	0	0

Singapore PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coherence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
Panama Singapore	2006	7	0	2	0	0	0	0	0	0	0
Association of Southeast Asian Nations Korea	2006	2	0	0	0	0	0	1	0	0	0
Association of Southeast Asian Nations China Services	2007	0	0	0	0	0	0	0	0	0	0
Association of Southeast Asian Nations Korea services	2007	0	0	0	0	0	0	0	0	0	0
Association of Southeast Asian Nations Japan	2008	3	0	0	0	0	0	0	0	0	0
Peru Singapore	2008	9	1	2	0	1	1	1	3	0	0
China Singapore	2008	0	0	0	0	0	0	0	0	0	0
Gulf Cooperation Council (GCC) Singapore	2008	0	0	0	0	0	0	0	0	0	0
Association of Southeast Asian Nations Goods	2009	0	0	0	0	0	0	0	0	0	0
Association of Southeast Asian Nations Australia New Zealand FTA (AANZFTA)	2009	21	7	5	3	9	4	12	5	0	0
Association of Southeast Asian Nations India	2009	0	0	0	0	0	0	0	0	0	0
Costa Rica Singapore	2010	13	3	3	1	3	2	12	3	0	0
Singapore Taiwan	2013	15	0	2	0	7	0	1	0	0	0
Singapore Turkey	2015	20	9	5	4	8	5	19	5	0	0
Trans-Pacific Partnership (TPP)	2016	24	15	5	6	11	9	17	42	21	0

Singapore PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coherence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
Australia Singapore	2016	22	6	4	4	11	2	16	9	5	0
Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)	2018	24	15	5	6	11	9	17	35	21	0
Singapore Sri Lanka	2018	24	9	5	4	12	5	10	2	0	0
EC Singapore	2018	17	9	5	4	8	5	15	28	15	0
Singapore PTAs	**Total**	**322**	**97**	**65**	**44**	**127**	**53**	**159**	**166**	**78**	**0**

Appendix 16: Descriptive Statistics – Detailed Coding Profile Taiwan

Taiwan PTAs	year_signature	ipr_general_sum	ipr_specific_sum	ipr_general_enforcement_sum	ipr_specific_enforcement_sum	ipr_scope_mentioned_sum	ipr_scope_tangible_sum	ipr_multilateral_coher-ence_dummy_sum	ipr_tripsplus_per_pta	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion
Panama Taiwan	2003	15	6	4	2	4	4	9	7	0	1
Guatemala Taiwan	2005	19	4	4	2	8	2	2	2	0	0
Nicaragua Taiwan	2006	22	11	5	4	10	7	10	8	1	0
El Salvador Honduras Taiwan	2007	6	0	2	0	0	0	1	0	0	0
New Zealand Taiwan	2013	19	3	4	1	8	2	1	1	0	0
Singapore Taiwan	2013	15	0	2	0	7	0	1	0	0	0
Taiwan PTAs	**Total**	**96**	**24**	**21**	**9**	**37**	**15**	**24**	**18**	**1**	**1**

Appendix 17: List of Net Bilateral Aid from DAC Donors

	Net bilateral aid from DAC donors
1	Australia
2	Austria
3	Belgium
4	Canada
5	Czech Republic
6	Denmark
7	EU
8	Finland
9	France
10	Germany
11	Greece
12	Iceland
13	Ireland
14	Italy
15	Japan
16	Luxembourg
17	Netherlands
18	New Zealand
19	Norway
20	Poland
21	Portugal
22	Slovakia
23	Slovenia
24	Spain
25	South Korea
26	Sweden
27	Switzerland
28	United Kingdom
29	United States

Appendix 18: Descriptive Statistics of the Indexes Based on Binary and Additive Variables (Design Data)

Variables	NAs	Min	Max	Median	Mean	Std.Dev.
Independent Variables						
Path Dependency						
Indexes based on binary IPR scope mentioned pl						
Copyrights and Related Rights	0	0	44	2.00	3.66	6.53
Trademarks	0	0	44	2.00	3.69	6.69
Geographical Indication	0	0	44	2.00	3.56	6.55
Industrial Designs	0	0	44	2.00	3.59	6.71
Patents	0	0	44	2.00	3.63	6.70
Undisclosed Information	0	0	44	2.00	3.54	6.55
Layout-Designs of Integrated Circuits	0	0	44	1.00	3.41	6.57
New Plant Varieties	0	0	44	1.00	2.88	6.25
Traditional Knowledge & Genetic Resources	0	0	31	0	1.14	4.38
Encrypted Program-carrying Satellite Signals	0	0	33	0	2.45	5.72
Domain Names	0	0	11	0	0.28	0.83
Indexes based on binary IPR scope tangible pl						
Copyrights and Related Rights	0	0	33	0	2.54	5.49
Trademarks	0	0	33	1.00	2.65	5.87
Geographical Indication	0	0	33	0	1.75	5.17
Industrial Designs	0	0	32	1.00	2.74	5.89
Patents	0	0	33	1.00	2.73	5.90
Undisclosed Information	0	0	33	0	1.67	4.69
Layout-Designs of Integrated Circuits	0	0	29	0	1.88	4.86
New Plant Varieties	0	0	29	0	2.15	5.73
Traditional Knowledge & Genetic Resources	0	0	31	0	0.91	4.24
Encrypted Program-carrying Satellite Signals	0	0	11	0	0.46	1.03
Domain Names	0	0	11	0	0.28	0.83
Indexes based on binary IPR scope tangible pdw s						
Copyrights and Related Rights	0	0	1.00	0	0.14	0.35
Trademarks	0	0	1.00	0	0.15	0.36
Geographical Indication	0	0	1.00	0	0.17	0.38
Industrial Designs	0	0	1.00	0	0.10	0.30
Patents	0	0	1.00	0	0.13	0.34
Undisclosed Information	0	0	1.00	0	0.08	0.27
Layout-Designs of Integrated Circuits	0	0	1.00	0	0.01	0.11
New Plant Varieties	0	0	1.00	0	0.02	0.16
Traditional Knowledge & Genetic Resources	0	0	1.00	0	0.04	0.21
Encrypted Program-carrying Satellite Signals	0	0	1.00	0	0.05	0.21
Domain Names	0	0	1.00	0	0.03	0.17
Indexes based on binary IPR scope tangible pdw f						
Copyrights and Related Rights	54	0	1.00	0	0.14	0.35
Trademarks	54	0	1.00	0	0.16	0.36

Variables	NAs	Min	Max	Median	Mean	Std.Dev.
Geographical Indication	54	0	1.00	0	0.18	0.38
Industrial Designs	54	0	1.00	0	0.11	0.31
Patents	54	0	1.00	0	0.14	0.35
Undisclosed Information	54	0	1.00	0	0.08	0.28
Layout-Designs of Integrated Circuits	54	0	1.00	0	0.01	0.12
New Plant Varieties	54	0	1.00	0	0.03	0.16
Traditional Knowledge & Genetic Resources	54	0	1.00	0	0.04	0.20
Encrypted Program-carrying Satellite Signals	54	0	1.00	0	0.05	0.22
Domain Names	54	0	1.00	0	0.03	0.17
Indexes based on additive TRIPS-plus categories pd						
Copyrights and Related Rights	0	0	33	0	2.34	5.33
Trademarks	0	0	33	0	2.57	5.87
Geographical Indication	0	0	33	1.00	2.42	5.44
Industrial Designs	0	0	32	1.00	2.65	5.87
Patents	0	0	33	0	2.33	5.57
Undisclosed Information	0	0	33	0	1.17	4.10
Layout-Designs of Integrated Circuits	0	0	4.00	0	0.13	0.41
New Plant Varieties	0	0	33	1.00	2.73	5.89
Traditional Knowledge & Genetic Resources	0	0	31	0	0.84	4.24
Encrypted Program-carrying Satellite Signals	0	0	11	0	0.47	1.04
Domain Names	0	0	11	0	0.28	0.83
Enforcement	0	0	33	1.00	2.40	5.47
Exhaustion	0	0	28	0	1.80	5.03
Indexes based on additive TRIPS-plus categories pdw s						
Copyrights and Related Rights	0	0	1.00	0	0.06	0.23
Trademarks	0	0	1.00	0	0.06	0.23
Geographical Indication	0	0	1.00	0	0.02	0.15
Industrial Designs	0	0	1.00	0	0.22	0.42
Patents	0	0	1.00	0	0.10	0.30
Undisclosed Information	0	0	1.00	0	0.12	0.32
Layout-Designs of Integrated Circuits	0	0	1.00	0	0.15	0.36
New Plant Varieties	0	0	1.00	0	0.08	0.28
Traditional Knowledge & Genetic Resources	0	0	1.00	0	0.09	0.28
Encrypted Program-carrying Satellite Signals	0	0	1.00	0	0.08	0.27
Domain Names	0	0	1.00	0	0	0.07
Enforcement	0	0	1.00	0	0.15	0.36
Exhaustion	0	0	1.00	0	0.04	0.20
Indexes based on additive TRIPS-plus categories pdw f						
Copyrights and Related Rights	54	0	1.00	0	0.06	0.24
Trademarks	54	0	1.00	0	0.06	0.24
Geographical Indication	54	0	1.00	0	0.02	0.15
Industrial Designs	54	0	1.00	0	0.24	0.42

Variables	NAs	Min	Max	Median	Mean	Std.Dev.
Patents	54	0	1.00	0	0.10	0.30
Undisclosed Information	54	0	1.00	0	0.12	0.32
Layout-Designs of Integrated Circuits	54	0	1.00	0	0.15	0.36
New Plant Varieties	54	0	1.00	0	0.09	0.28
Traditional Knowledge & Genetic Resources	54	0	1.00	0	0.09	0.28
Encrypted Program-carrying Satellite Signals	54	0	1.00	0	0.08	0.27
Domain Names	54	0	1.00	0	0.01	0.07
Enforcement	54	0	1.00	0	0.16	0.36
Exhaustion	54	0	1.00	0	0.04	0.19

Appendix 19: Model Fit of Design Analysis (AIC & BIC)

Models	AIC	df	BIC	df
m1ols_f	3249.26	36	3405.89	36
m1op_f	2297.79	59	2554.49	59
m1p_f	3716.51	35	3868.79	35
m1nb_f	2961.15	36	3117.78	36
m1hp_f	2417.90	70	2722.46	70
m1hnb_f	2383.21	71	2692.12	71
m1zip_f	2418.28	70	2722.85	70
m1zinb_f	2364.92	71	2673.83	71
Models	**AIC**	**df**	**BIC**	**df**
m2ols_f	2643.39	32	2782.61	32
m2op_f	1481.51	41	1659.90	41
m2p_f	2492.97	31	2627.85	31
m2nb_f	2133.31	32	2272.54	32
m2hp_f	1627.71	62	1897.47	62
m2hnb_f	1629.78	63	1903.89	63
m2zip_f	1623.62	62	1893.38	62
m2zinb_f	1625.62	63	1899.73	63
Models	**AIC**	**df**	**BIC**	**df**
m3aols_f	437.56	23	537.63	23
m3aop_f	435.08	20	522.09	20
m3ap_f	769.12	22	864.84	22
m3anb_f	771.13	23	871.20	23
m3ahp_f	477.59	44	669.03	44
m3ahnb_f	480.36	45	676.15	45
m3azinb_f	719.91	45	915.70	45
Models	**AIC**	**df**	**BIC**	**df**
m3bols_f	432.78	22	528.50	22
m3bop_f	434.78	21	526.15	21
m3bp_f	752.52	21	843.89	21
m3bnb_f	754.54	22	850.26	22
m3bhp_f	476.24	42	658.97	42
m3bhnb_f	478.33	43	665.41	43
Models	**AIC**	**df**	**BIC**	**df**
m3cols_f	358.65	26	471.77	26
m3cop_f	354.57	25	463.34	25
m3cp_f	731.20	25	839.97	25
m3cnb_f	733.21	26	846.34	26
m3chp_f	403.95	50	621.49	50
m3chnb_f	406.13	51	628.02	51
Models	**AIC**	**df**	**BIC**	**df**
m3dols_f	500.66	28	622.48	28
m3dop_f	488.59	27	606.06	27
m3dp_f	695.63	27	813.10	27
m3dnb_f	697.64	28	819.47	28
m3dhp_f	542.55	54	777.50	54
m3dhnb_f	544.58	55	783.88	55
Models	**AIC**	**df**	**BIC**	**df**
m3eols_f	482.13	26	595.25	26
m3eop_f	476.18	25	584.95	25
m3ep_f	735.13	25	843.90	25
m3enb_f	737.14	26	850.27	26

m3ehp_f	525.27	50	742.81	50
m3ehnb_f	528.18	51	750.07	51
m3ezinb_f	702.57	51	924.47	51
Models	**AIC**	**df**	**BIC**	**df**
m3fols_f	464.88	27	582.35	27
m3fop_f	452.66	26	565.78	26
m3fp_f	657.68	26	770.80	26
m3fnb_f	659.71	27	777.18	27
m3fhp_f	504.66	52	730.90	52
m3fhnb_f	506.66	53	737.25	53
Models	**AIC**	**df**	**BIC**	**df**
m3gols_f	419.54	28	541.36	28
m3gop_f	414.93	27	532.40	27
m3gp_f	627.80	27	745.28	27
m3gnb_f	629.83	28	751.65	28
m3ghp_f	468.93	54	703.88	54
m3gzinb_f	578.95	55	818.25	55
Models	**AIC**	**df**	**BIC**	**df**
m3hols_f	314.40	23	414.47	23
m3hop_f	382.71	22	478.43	22
m3hp_f	445.00	22	540.72	22
m3hnb_f	447.02	23	547.09	23
m3hhp_f	425.92	44	617.36	44
m3hhnb_f	428.71	45	624.50	45
Models	**AIC**	**df**	**BIC**	**df**
m3iols_f	-97.93	23	2.14	23
m3iop_f	190.16	22	285.88	22
m3ip_f	219.06	22	314.78	22
m3inb_f	221.07	23	321.14	23
Models	**AIC**	**df**	**BIC**	**df**
m3jols_f	-189.35	27	-71.88	27
m3jop_f	136.19	26	249.31	26
m3jp_f	181.75	26	294.88	26
m3jnb_f	183.76	27	301.23	27
m3jhnb_f	189.42	53	420.02	53
Models	**AIC**	**df**	**BIC**	**df**
m3kols_f	-531.64	21	-440.28	21
m3kop_f	78.86	20	165.88	20
m3kp_f	100.83	20	187.85	20
m3knb_f	102.84	21	194.21	21
Models	**AIC**	**df**	**BIC**	**df**
m4ols_f	1515.78	29	1641.95	29
m4op_f	1096.54	33	1240.12	33
m4p_f	1193.10	28	1314.92	28
m4nb_f	1195.10	29	1321.28	29
m4hp_f	1059.20	56	1302.85	56
m4hnb_f	1061.20	57	1309.20	57
m4zip_f	1034.74	56	1278.39	56
Models	**AIC**	**df**	**BIC**	**df**
m5ols_f	3385.68	33	3529.26	33
m5op_f	2042.93	55	2282.23	55
m5p_f	3437.45	32	3576.68	32
m5nb_f	2273.59	33	2417.17	33
Models	**AIC**	**df**	**BIC**	**df**

m6epa1_ols	1659.95	23	1751.29	23
m6epa1_op	555.21	36	698.18	36
m6epa1_p	830.38	22	917.75	22
m6epa1_nb	678.57	23	769.91	23
m6epa1_hp	612.87	44	787.61	44
m6epa1_hnb	611.61	45	790.32	45
m6epa1_zip	605.86	44	780.59	44
m6epa1_zinb	594.05	45	772.76	45
Models	**AIC**	**df**	**BIC**	**df**
m6epa2_ols	1698.57	23	1789.91	23
m6epa2_op	578.63	36	721.60	36
m6epa2_p	840.13	22	927.50	22
m6epa2_nb	694.62	23	785.96	23
m6epa2_hp	631.68	44	806.42	44
m6epa2_hnb	629.26	45	807.97	45
m6epa2_zip	616.59	44	791.33	44
m6epa2_zinb	584.09	45	762.79	45
Models	**AIC**	**df**	**BIC**	**df**
m6di1_ols	2237.63	36	2391.39	36
m6di1_op	759.06	49	968.34	49
m6di1_p	1191.38	35	1340.87	35
m6di1_nb	982.09	36	1135.85	36
m6di1_hp	831.23	70	1130.20	70
m6di1_hnb	833.23	71	1136.47	71
m6di1_zip	830.80	70	1129.77	70
m6di1_zinb	832.80	71	1136.04	71
Models	**AIC**	**df**	**BIC**	**df**
m6pdg1_ols	2237.67	27	2352.98	27
m6pdg1_op	775.52	40	946.36	40
m6pdg1_p	1276.11	26	1387.15	26
m6pdg1_nb	1005.13	27	1120.44	27
m6pdg1_hp	813.77	52	1035.86	52
m6pdg1_hnb	815.32	53	1041.68	53
m6pdg1_zip	814.15	52	1036.24	52
m6pdg1_zinb	815.71	53	1042.07	53
Models	**AIC**	**df**	**BIC**	**df**
m6pds1_ols	2212.58	26	2323.62	26
m6pds1_op	766.00	39	932.57	39
m6pds1_p	1258.28	25	1365.06	25
m6pds1_nb	974.90	26	1085.94	26
Models	**AIC**	**df**	**BIC**	**df**
m6pds1.2_ols	2237.34	20	2322.76	20
m6pds1.2_op	774.22	33	915.16	33
m6pds1.2_p	1315.50	19	1396.65	19
m6pds1.2_nb	996.77	20	1082.19	20
m6pds1.2_hp	852.77	38	1015.06	38
m6pds1.2_hnb	849.62	39	1016.19	39
m6pds1.2_zip	848.60	38	1010.90	38
m6pds1.2_zinb	850.30	39	1016.87	39
Models	**AIC**	**df**	**BIC**	**df**
m6pdtp1_ols	2232.60	26	2343.65	26
m6pdtp1_op	783.87	39	950.44	39
m6pdtp1_p	1274.62	25	1381.40	25
m6pdtp1_nb	989.04	26	1100.09	26

m6pdtp1_hp	837.68	50	1051.23	50
m6pdtp1_hnb	839.05	51	1056.87	51
m6pdtp1_zip	829.91	50	1043.46	50
m6pdtp1_zinb	831.22	51	1049.05	51
Models	**AIC**	**df**	**BIC**	**df**
m6pdwss1_ols	-31420.19	26	-31309.14	26
m6pdwss1_op	78.00	39	244.57	39
m6pdwss1_p	820.11	25	926.88	25
m6pdwss1_nb	791.30	26	902.35	26
m6pdwss1_hp	513.92	50	727.47	50
m6pdwss1_hnb	515.92	51	733.75	51
Models	**AIC**	**df**	**BIC**	**df**
m6pdwstp1_ols	1461.96	25	1568.74	25
m6pdwstp1_op	567.76	38	730.05	38
m6pdwstp1_p	680.51	24	783.01	24
m6pdwstp1_nb	682.56	25	789.33	25
m6pdwstp1_hp	650.03	48	855.04	48
m6pdwstp1_hnb	652.03	49	861.31	49
Models	**AIC**	**df**	**BIC**	**df**
m6pdwfs1_ols	-29598.11	26	-29489.37	26
m6pdwfs1_op	76.00	38	234.92	38
m6pdwfs1_p	783.65	25	888.20	25
m6pdwfs1_nb	758.48	26	867.21	26
m6pdwfs1_hp	497.11	50	706.21	50
m6pdwfs1_hnb	499.11	51	712.39	51
Models	**AIC**	**df**	**BIC**	**df**
m6pdwftp1_ols	1382.68	24	1483.05	24
m6pdwftp1_op	547.09	36	697.64	36
m6pdwftp1_p	658.15	23	754.33	23
m6pdwftp1_nb	660.19	24	760.56	24
m6pdwftp1_hp	628.09	46	820.46	46
m6pdwftp1_hnb	630.09	47	826.64	47
Models	**AIC**	**df**	**BIC**	**df**
m7epa3_ols	880.91	24	976.22	24
m7epa3_op	371.37	31	494.48	31
m7epa3_p	473.50	23	564.83	23
m7epa3_nb	466.47	24	561.78	24
m7epa3_hp	385.38	46	568.06	46
m7epa3_hnb	387.38	47	574.03	47
Models	**AIC**	**df**	**BIC**	**df**
m7di3_ols	1240.18	37	1398.21	37
m7di3_op	518.60	44	706.52	44
m7di3_p	667.11	36	820.87	36
m7di3_nb	660.10	37	818.12	37
m7di3_hp	561.32	72	868.83	72
m7di3_hnb	563.32	73	875.10	73
Models	**AIC**	**df**	**BIC**	**df**
m7di4_ols	1257.97	37	1416.00	37
m7di4_op	532.28	44	720.20	44
m7di4_p	675.53	36	829.28	36
m7di4_nb	668.82	37	826.84	37
m7di4_hp	560.45	72	867.96	72
m7di4_hnb	562.45	73	874.24	73
Models	**AIC**	**df**	**BIC**	**df**

m7pdg3_ols	1239.05	28	1358.64	28
m7pdg3_op	527.99	35	677.48	35
m7pdg3_p	686.78	27	802.10	27
m7pdg3_nb	670.45	28	790.04	28
m7pdg3_hp	541.78	54	772.42	54
m7pdg3_hnb	543.78	55	778.69	55
Models	**AIC**	**df**	**BIC**	**df**
m7pds3_ols	1229.72	27	1345.03	27
m7pds3_op	522.05	34	667.26	34
m7pds3_p	679.73	26	790.78	26
m7pds3_nb	661.79	27	777.10	27
m7pds3_hp	547.01	52	769.10	52
m7pds3_hnb	549.01	53	775.38	53
Models	**AIC**	**df**	**BIC**	**df**
m7pds3.2_ols	1228.38	23	1326.61	23
m7pds3.2_op	519.27	30	647.40	30
m7pds3.2_p	687.48	22	781.44	22
m7pds3.2_nb	666.96	23	765.20	23
m7pds3.2_hp	536.63	44	724.56	44
m7pds3.2_hnb	538.63	45	730.83	45
Models	**AIC**	**df**	**BIC**	**df**
m7pdtp3_ols	1216.51	27	1331.83	27
m7pdtp3_op	524.58	34	669.79	34
m7pdtp3_p	677.10	26	788.14	26
m7pdtp3_nb	665.26	27	780.57	27
m7pdtp3_hp	540.51	52	762.60	52
m7pdtp3_hnb	542.51	53	768.87	53
Models	**AIC**	**df**	**BIC**	**df**
m7pdwss1_ols	-32765.36	27	-32650.05	27
m7pdwss1_op	68.00	34	213.21	34
m7pdwss1_p	546.88	26	657.93	26
m7pdwss1_nb	548.89	27	664.21	27
m7pdwss1_hp	399.10	52	621.19	52
m7pdwss1_hnb	401.10	53	627.47	53
Models	**AIC**	**df**	**BIC**	**df**
m7pdwstp3_ols	804.42	26	915.47	26
m7pdwstp3_op	380.37	33	521.31	33
m7pdwstp3_p	466.58	25	573.35	25
m7pdwstp3_nb	468.65	26	579.69	26
m7pdwstp3_hp	455.30	50	668.85	50
m7pdwstp3_hnb	457.30	51	675.12	51
Models	**AIC**	**df**	**BIC**	**df**
m7pdwfs1_ols	-28980.37	27	-28867.45	27
m7pdwfs1_op	66.00	33	204.01	33
m7pdwfs1_p	522.52	26	631.26	26
m7pdwfs1_nb	524.53	27	637.45	27
m7pdwfs1_hp	384.69	52	602.16	52
m7pdwfs1_hnb	386.69	53	608.34	53
Models	**AIC**	**df**	**BIC**	**df**
m7pdwftp3_ols	732.61	25	837.17	25
m7pdwftp3_op	355.06	31	484.71	31
m7pdwftp3_p	447.32	24	547.69	24
m7pdwftp3_nb	449.39	25	553.94	25
m7pdwftp3_hp	438.78	48	639.52	48

m7pdwftp3_hnb	440.78	49	645.70	49
Models	**AIC**	**df**	**BIC**	**df**
m8aepa1_ols	-244.54	24	-149.23	24
m8aepa1_op	95.15	23	186.48	23
m8aepa1_p	180.69	23	272.03	23
m8aepa1_nb	182.70	24	278.01	24
Models	**AIC**	**df**	**BIC**	**df**
m8adi1_ols	-281.32	37	-123.29	37
m8adi1_op	124.39	36	278.15	36
m8adi1_p	260.41	36	414.16	36
m8adi1_nb	262.41	37	420.44	37
m8adi1_hp	196.39	72	503.90	72
m8adi1_hnb	198.39	73	510.17	73
Models	**AIC**	**df**	**BIC**	**df**
m8apdg2_ols	-289.62	27	-174.31	27
m8apdg2_op	135.51	26	246.55	26
m8apdg2_p	252.92	26	363.96	26
m8apdg2_nb	254.92	27	370.24	27
Models	**AIC**	**df**	**BIC**	**df**
m8apds2_ols	-302.57	27	-187.25	27
m8apds2_op	110.34	26	221.38	26
m8apds2_p	248.93	26	359.98	26
m8apds2_nb	250.94	27	366.25	27
m8apds2_hp	161.73	52	383.82	52
m8apds2_hnb	164.30	53	390.66	53
Models	**AIC**	**df**	**BIC**	**df**
m8apdtp1_ols	-318.43	27	-203.11	27
m8apdtp1_op	105.64	26	216.69	26
m8apdtp1_p	239.81	26	350.85	26
m8apdtp1_nb	241.81	27	357.13	27
m8apdtp1_hp	157.64	52	379.74	52
m8apdtp1_hnb	159.64	53	386.01	53
Models	**AIC**	**df**	**BIC**	**df**
m8apdwss2_ols	-34944.15	27	-34828.83	27
m8apdwss2_op	52.00	26	163.05	26
m8apdwss2_p	178.00	26	289.05	26
m8apdwss2_nb	180.00	27	295.32	27
Models	**AIC**	**df**	**BIC**	**df**
m8apdwss2_ols	-34944.15	27	-34828.83	27
m8apdwss2_op	52.00	26	163.05	26
m8apdwss2_p	178.00	26	289.05	26
m8apdwss2_nb	180.00	27	295.32	27
Models	**AIC**	**df**	**BIC**	**df**
m8apdwstp1_ols	-662.01	26	-550.96	26
m8apdwstp1_op	50.00	25	156.77	25
m8apdwstp1_p	204.65	25	311.42	25
m8apdwstp1_nb	206.65	26	317.69	26
Models	**AIC**	**df**	**BIC**	**df**
m8apdwfs2_ols	-30582.73	27	-30469.81	27
m8apdwfs2_op	52.00	26	160.73	26
m8apdwfs2_p	170.00	26	278.73	26
m8apdwfs2_nb	172.00	27	284.92	27
Models	**AIC**	**df**	**BIC**	**df**
m8apdwftp1_ols	-544.17	25	-439.62	25

m8apdwftp1_op	63.95	24	164.32	24
m8apdwftp1_p	194.53	24	294.90	24
m8apdwftp1_nb	196.53	25	301.09	25
Models	**AIC**	**df**	**BIC**	**df**
m8bepa3_ols	-246.53	24	-151.22	24
m8bepa3_op	87.32	23	178.66	23
m8bepa3_p	193.75	23	285.09	23
m8bepa3_nb	195.76	24	291.07	24
Models	**AIC**	**df**	**BIC**	**df**
m8bdi2_ols	-348.16	37	-190.13	37
m8bdi2_op	72.00	36	225.76	36
m8bdi2_p	265.99	36	419.74	36
m8bdi2_nb	267.99	37	426.02	37
Models	**AIC**	**df**	**BIC**	**df**
m8bpdg2_ols	-330.84	28	-211.25	28
m8bpdg2_op	114.38	27	229.70	27
m8bpdg2_p	262.60	27	377.91	27
m8bpdg2_nb	264.60	28	384.19	28
Models	**AIC**	**df**	**BIC**	**df**
m8bpds2_ols	-353.12	27	-237.81	27
m8bpds2_op	109.79	26	220.83	26
m8bpds2_p	255.95	26	366.99	26
m8bpds2_nb	257.95	27	373.27	27
Models	**AIC**	**df**	**BIC**	**df**
m8bpdtp2_ols	-354.41	27	-239.09	27
m8bpdtp2_op	96.31	26	207.36	26
m8bpdtp2_p	258.68	26	369.73	26
m8bpdtp2_nb	260.69	27	376.00	27
Models	**AIC**	**df**	**BIC**	**df**
m8bpdwss2_ols	-33634.99	27	-33519.67	27
m8bpdwss2_op	52.00	26	163.05	26
m8bpdwss2_p	190.00	26	301.05	26
m8bpdwss2_nb	192.00	27	307.32	27
Models	**AIC**	**df**	**BIC**	**df**
m8bpdwstp2_ols	-568.77	26	-457.72	26
m8bpdwstp2_op	50.00	25	156.77	25
m8bpdwstp2_p	231.85	25	338.63	25
m8bpdwstp2_nb	233.88	26	344.92	26
Models	**AIC**	**df**	**BIC**	**df**
m8bpdwfs2_ols	-31332.05	27	-31219.13	27
m8bpdwfs2_op	52.00	26	160.73	26
m8bpdwfs2_p	182.00	26	290.73	26
m8bpdwfs2_nb	184.00	27	296.92	27
Models	**AIC**	**df**	**BIC**	**df**
m8bpdwftp3_ols	-499.90	25	-395.35	25
m8bpdwftp3_op	48.00	24	148.37	24
m8bpdwftp3_p	220.11	24	320.48	24
m8bpdwftp3_nb	222.14	25	326.69	25
Models	**AIC**	**df**	**BIC**	**df**
m8cepa3_ols	-2.43	24	92.88	24
m8cepa3_op	154.40	23	245.74	23
m8cepa3_p	243.50	23	334.84	23
m8cepa3_nb	245.50	24	340.81	24
Models	**AIC**	**df**	**BIC**	**df**

m8cdi3_ols	-21.91	37	136.12	37
m8cdi3_op	183.44	36	337.20	36
m8cdi3_p	312.16	36	465.92	36
m8cdi3_nb	314.17	37	472.19	37
m8cdi3_hp	255.44	72	562.95	72
m8cdi3_hnb	257.44	73	569.22	73
Models	**AIC**	**df**	**BIC**	**df**
m8cpdg3_ols	-22.89	28	96.70	28
m8cpdg3_op	185.47	27	300.79	27
m8cpdg3_p	307.62	27	422.94	27
m8cpdg3_nb	309.63	28	429.22	28
Models	**AIC**	**df**	**BIC**	**df**
m8cpds3_ols	-43.80	27	71.52	27
m8cpds3_op	180.27	26	291.31	26
m8cpds3_p	304.50	26	415.55	26
m8cpds3_nb	306.51	27	421.82	27
m8cpds3_hp	230.54	52	452.63	52
m8cpds3_hnb	234.22	53	460.58	53
Models	**AIC**	**df**	**BIC**	**df**
m8cpdtp3_ols	-36.92	27	78.39	27
m8cpdtp3_op	185.93	26	296.98	26
m8cpdtp3_p	304.11	26	415.15	26
m8cpdtp3_nb	306.11	27	421.43	27
m8cpdtp3_hp	237.85	52	459.94	52
m8cpdtp3_hnb	239.93	53	466.29	53
Models	**AIC**	**df**	**BIC**	**df**
m8cpdwss2_ols	-34354.72	27	-34239.40	27
m8cpdwss2_op	52.00	26	163.05	26
m8cpdwss2_p	208.00	26	319.05	26
m8cpdwss2_nb	210.00	27	325.32	27
Models	**AIC**	**df**	**BIC**	**df**
m8cpdwstp1_ols	-432.55	26	-321.51	26
m8cpdwstp1_op	105.52	25	212.30	25
m8cpdwstp1_p	266.83	25	373.61	25
m8cpdwstp1_nb	268.85	26	379.90	26
m8cpdwstp1_hp	155.47	50	369.02	50
m8cpdwstp1_hnb	157.52	51	375.34	51
Models	**AIC**	**df**	**BIC**	**df**
m8cpdwfs2_ols	-35652.82	27	-35539.91	27
m8cpdwfs2_op	52.00	26	160.73	26
m8cpdwfs2_p	202.00	26	310.73	26
m8cpdwfs2_nb	204.00	27	316.92	27
Models	**AIC**	**df**	**BIC**	**df**
m8cpdwftp1_ols	-274.25	25	-169.70	25
m8cpdwftp1_op	126.66	24	227.03	24
m8cpdwftp1_p	260.56	24	360.93	24
m8cpdwftp1_nb	262.58	25	367.13	25
Models	**AIC**	**df**	**BIC**	**df**
m8depa4_ols	-293.51	24	-198.20	24
m8depa4_op	46.00	23	137.34	23
m8depa4_p	106.98	23	198.32	23
m8depa4_nb	108.98	24	204.29	24
Models	**AIC**	**df**	**BIC**	**df**
m8ddi4_ols	-274.57	37	-116.55	37

m8ddi4_op	118.40	36	272.15	36
m8ddi4_p	194.85	36	348.60	36
m8ddi4_nb	196.85	37	354.88	37
m8ddi4_hp	189.91	72	497.43	72
Models	**AIC**	**df**	**BIC**	**df**
m8dpdg4_ols	-309.34	28	-189.75	28
m8dpdg4_op	93.58	27	208.89	27
m8dpdg4_p	171.95	27	287.26	27
m8dpdg4_nb	173.95	28	293.54	28
Models	**AIC**	**df**	**BIC**	**df**
m8dpds4_ols	-328.07	27	-212.75	27
m8dpds4_op	89.37	26	200.41	26
m8dpds4_p	172.79	26	283.84	26
m8dpds4_nb	174.79	27	290.11	27
Models	**AIC**	**df**	**BIC**	**df**
m8dpdtp4_ols	-354.80	27	-239.49	27
m8dpdtp4_op	79.04	26	190.08	26
m8dpdtp4_p	171.49	26	282.54	26
m8dpdtp4_nb	173.49	27	288.81	27
Models	**AIC**	**df**	**BIC**	**df**
m8dpdwss1_ols	-33835.06	27	-33719.74	27
m8dpdwss1_op	52.00	26	163.05	26
m8dpdwss1_p	128.00	26	239.05	26
m8dpdwss1_nb	130.00	27	245.32	27
Models	**AIC**	**df**	**BIC**	**df**
m8dpdwstp4_ols	-856.98	26	-745.93	26
m8dpdwstp4_op	50.00	25	156.77	25
m8dpdwstp4_p	148.74	25	255.51	25
m8dpdwstp4_nb	150.74	26	261.79	26
Models	**AIC**	**df**	**BIC**	**df**
m8dpdwfs1_ols	-31099.32	27	-30986.40	27
m8dpdwfs1_op	50.00	25	154.55	25
m8dpdwfs1_p	124.00	26	232.73	26
m8dpdwfs1_nb	126.00	27	238.92	27
Models	**AIC**	**df**	**BIC**	**df**
m8dpdwftp4_ols	-792.67	25	-688.12	25
m8dpdwftp4_op	48.00	24	148.37	24
m8dpdwftp4_p	140.88	24	241.25	24
m8dpdwftp4_nb	142.88	25	247.43	25
Models	**AIC**	**df**	**BIC**	**df**
m8eepa4_ols	-346.14	24	-250.83	24
m8eepa4_op	80.51	23	171.84	23
m8eepa4_p	140.27	23	231.61	23
m8eepa4_nb	142.28	24	237.59	24
Models	**AIC**	**df**	**BIC**	**df**
m8edi3_ols	-375.67	37	-217.64	37
m8edi3_op	129.28	36	283.03	36
m8edi3_p	234.01	36	387.77	36
m8edi3_nb	236.02	37	394.05	37
m8edi3_hp	201.28	72	508.79	72
m8edi3_hnb	203.28	73	515.06	73
Models	**AIC**	**df**	**BIC**	**df**
m8epdg3_ols	-404.56	28	-284.97	28
m8epdg3_op	118.81	27	234.12	27

m8epdg3_p	217.42	27	332.73	27
m8epdg3_nb	219.42	28	339.01	28
Models	**AIC**	**df**	**BIC**	**df**
m8epds3_ols	-402.18	27	-286.86	27
m8epds3_op	120.92	26	231.96	26
m8epds3_p	217.98	26	329.02	26
m8epds3_nb	219.99	27	335.30	27
Models	**AIC**	**df**	**BIC**	**df**
m8epdtp3_ols	-403.47	27	-288.16	27
m8epdtp3_op	122.02	26	233.06	26
m8epdtp3_p	217.96	26	329.00	26
m8epdtp3_nb	219.97	27	335.28	27
m8epdtp3_hp	173.59	52	395.69	52
m8epdtp3_hnb	176.01	53	402.37	53
Models	**AIC**	**df**	**BIC**	**df**
m8epdwss1_ols	-35656.10	27	-35540.79	27
m8epdwss1_op	52.00	26	163.05	26
m8epdwss1_p	164.00	26	275.05	26
m8epdwss1_nb	166.00	27	281.32	27
Models	**AIC**	**df**	**BIC**	**df**
m8epdwstp3_ols	-556.80	26	-445.76	26
m8epdwstp3_op	77.77	25	184.54	25
m8epdwstp3_p	201.09	25	307.86	25
m8epdwstp3_nb	203.11	26	314.15	26
Models	**AIC**	**df**	**BIC**	**df**
m8epdwfs1_ols	-36047.45	27	-35934.53	27
m8epdwfs1_op	50.00	25	154.55	25
m8epdwfs1_p	160.00	26	268.73	26
m8epdwfs1_nb	162.00	27	274.92	27
Models	**AIC**	**df**	**BIC**	**df**
m8epdwftp3_ols	-448.90	25	-344.34	25
m8epdwftp3_op	77.73	24	178.10	24
m8epdwftp3_p	194.95	24	295.32	24
m8epdwftp3_nb	196.98	25	301.53	25
Models	**AIC**	**df**	**BIC**	**df**
m8fepa3_ols	-222.61	24	-127.30	24
m8fepa3_op	96.60	23	187.94	23
m8fepa3_p	116.27	23	207.61	23
m8fepa3_nb	118.27	24	213.58	24
Models	**AIC**	**df**	**BIC**	**df**
m8fdi3_ols	-254.03	37	-96.00	37
m8fdi3_op	123.41	36	277.17	36
m8fdi3_p	173.40	36	327.16	36
m8fdi3_nb	175.40	37	333.43	37
Models	**AIC**	**df**	**BIC**	**df**
m8fpdg3_ols	-270.14	28	-150.55	28
m8fpdg3_op	123.44	27	238.76	27
m8fpdg3_p	158.08	27	273.39	27
m8fpdg3_nb	160.08	28	279.67	28
Models	**AIC**	**df**	**BIC**	**df**
m8fpds3_ols	-279.81	27	-164.49	27
m8fpds3_op	126.01	26	237.06	26
m8fpds3_p	162.25	26	273.30	26
m8fpds3_nb	164.25	27	279.57	27

m8fpds3_hp	178.00	52	400.09	52
m8fpds3_hnb	180.01	53	406.37	53
Models	**AIC**	**df**	**BIC**	**df**
m8fpdtp3_ols	-261.40	27	-146.08	27
m8fpdtp3_op	130.29	26	241.34	26
m8fpdtp3_p	158.08	26	269.13	26
m8fpdtp3_nb	160.09	27	275.40	27
Models	**AIC**	**df**	**BIC**	**df**
m8fpdwss1_ols	-34797.29	27	-34681.98	27
m8fpdwss1_op	52.00	26	163.05	26
m8fpdwss1_p	110.00	26	221.05	26
m8fpdwss1_nb	112.00	27	227.32	27
Models	**AIC**	**df**	**BIC**	**df**
m8fpdwstp3_ols	-345.73	26	-234.69	26
m8fpdwstp3_op	126.13	25	232.90	25
m8fpdwstp3_p	154.96	25	261.74	25
m8fpdwstp3_nb	156.97	26	268.01	26
Models	**AIC**	**df**	**BIC**	**df**
m8fpdwfs1_ols	-32535.93	27	-32423.01	27
m8fpdwfs1_op	50.00	25	154.55	25
m8fpdwfs1_p	106.00	26	214.73	26
m8fpdwfs1_nb	108.00	27	220.92	27
Models	**AIC**	**df**	**BIC**	**df**
m8fpdwftp3_ols	-284.74	25	-180.18	25
m8fpdwftp3_op	122.17	24	222.54	24
m8fpdwftp3_p	147.44	24	247.81	24
m8fpdwftp3_nb	149.44	25	253.99	25
Models	**AIC**	**df**	**BIC**	**df**
m8gepa4_ols	-690.74	24	-595.43	24
m8gepa4_op	46.00	23	137.34	23
m8gepa4_p	54.00	23	145.34	23
m8gepa4_nb	56.00	24	151.31	24
Models	**AIC**	**df**	**BIC**	**df**
m8gdi4_ols	-967.11	37	-809.09	37
m8gdi4_op	72.00	36	225.76	36
m8gdi4_p	82.00	36	235.76	36
m8gdi4_nb	84.00	37	242.03	37
Models	**AIC**	**df**	**BIC**	**df**
m8gpdg4_ols	-1022.65	28	-903.06	28
m8gpdg4_op	54.00	27	169.32	27
m8gpdg4_p	64.00	27	179.32	27
m8gpdg4_nb	66.00	28	185.59	28
Models	**AIC**	**df**	**BIC**	**df**
m8gpds3_ols	-1037.00	27	-921.68	27
m8gpds3_op	52.00	26	163.05	26
m8gpds3_p	62.00	26	173.05	26
m8gpds3_nb	64.00	27	179.32	27
m8gpds3_hp	178.00	52	400.09	52
m8gpds3_hnb	180.01	53	406.37	53
Models	**AIC**	**df**	**BIC**	**df**
m8gpdtp3_ols	-1019.73	27	-904.42	27
m8gpdtp3_op	52.00	26	163.05	26
m8gpdtp3_p	62.00	26	173.05	26
m8gpdtp3_nb	64.00	27	179.32	27

Models	**AIC**	**df**	**BIC**	**df**
m8gpdwss1_ols	-36318.11	27	-36202.80	27
m8gpdwss1_op	52.00	26	163.05	26
m8gpdwss1_p	62.00	26	173.05	26
m8gpdwss1_nb	64.00	27	179.32	27
Models	**AIC**	**df**	**BIC**	**df**
m8gpdwstp4_ols	-1475.05	26	-1364.00	26
m8gpdwstp4_op	50.00	25	156.77	25
m8gpdwstp4_p	60.00	25	166.77	25
m8gpdwstp4_nb	62.00	26	173.05	26
Models	**AIC**	**df**	**BIC**	**df**
m8gpdwfs1_ols	-32754.27	27	-32641.35	27
m8gpdwfs1_op	50.00	25	154.55	25
m8gpdwfs1_p	62.00	26	170.73	26
m8gpdwfs1_nb	64.00	27	176.92	27
Models	**AIC**	**df**	**BIC**	**df**
m8gpdwftp4_ols	-1296.80	25	-1192.24	25
m8gpdwftp4_op	48.00	24	148.37	24
m8gpdwftp4_p	58.00	24	158.37	24
m8gpdwftp4_nb	60.00	25	164.55	25
Models	**AIC**	**df**	**BIC**	**df**
m8hepa4_ols	-702.61	24	-607.30	24
m8hepa4_op	46.00	23	137.34	23
m8hepa4_p	54.00	23	145.34	23
m8hepa4_nb	56.00	24	151.31	24
Models	**AIC**	**df**	**BIC**	**df**
m8hdi4_ols	-548.65	37	-390.62	37
m8hdi4_op	72.00	36	225.76	36
m8hdi4_p	96.00	36	249.76	36
Models	**AIC**	**df**	**BIC**	**df**
m8hpdg3_ols	-563.21	28	-443.62	28
m8hpdg3_op	95.37	27	210.68	27
m8hpdg3_p	104.63	27	219.95	27
m8hpdg3_nb	106.63	28	226.22	28
Models	**AIC**	**df**	**BIC**	**df**
m8hpds4_ols	-584.09	27	-468.78	27
m8hpds4_op	83.30	26	194.35	26
m8hpds4_p	97.49	26	208.53	26
m8hpds4_nb	99.49	27	214.81	27
Models	**AIC**	**df**	**BIC**	**df**
m8hpdtp3_ols	-619.23	27	-503.91	27
m8hpdtp3_op	52.00	26	163.05	26
m8hpdtp3_p	86.73	26	197.77	26
m8hpdtp3_nb	88.73	27	204.04	27
Models	**AIC**	**df**	**BIC**	**df**
m8hpdwss1_ols	-35195.46	27	-35080.14	27
m8hpdwss1_op	52.00	26	163.05	26
m8hpdwss1_p	76.00	26	187.05	26
m8hpdwss1_nb	78.00	27	193.32	27
Models	**AIC**	**df**	**BIC**	**df**
m8hpdwstp3_ols	-753.40	26	-642.35	26
m8hpdwstp3_op	50.00	25	156.77	25
m8hpdwstp3_p	74.00	25	180.77	25
m8hpdwstp3_nb	76.00	26	187.05	26

Models	AIC	df	BIC	df
m8hpdwfs1_ols	-31779.96	27	-31667.04	27
m8hpdwfs1_op	50.00	25	154.55	25
m8hpdwfs1_p	76.00	26	184.73	26
m8hpdwfs1_nb	78.00	27	190.92	27
Models	**AIC**	**df**	**BIC**	**df**
m8hpdwftp3_ols	-639.75	25	-535.20	25
m8hpdwftp3_op	48.00	24	148.37	24
m8hpdwftp3_p	72.00	24	172.37	24
m8hpdwftp3_nb	74.00	25	178.55	25
Models	**AIC**	**df**	**BIC**	**df**
m8iepa1_ols	-290.89	24	-195.58	24
m8iepa1_op	46.00	23	137.34	23
m8iepa1_p	79.25	23	170.59	23
m8iepa1_nb	81.25	24	176.56	24
Models	**AIC**	**df**	**BIC**	**df**
m8idi1_ols	-354.91	37	-196.89	37
m8idi1_op	72.00	36	225.76	36
m8idi1_p	114.00	36	267.76	36
m8idi1_nb	116.00	37	274.03	37
Models	**AIC**	**df**	**BIC**	**df**
m8ipdg1_ols	-383.77	28	-264.18	28
m8ipdg1_op	54.00	27	169.32	27
m8ipdg1_p	113.89	27	229.21	27
m8ipdg1_nb	115.89	28	235.48	28
Models	**AIC**	**df**	**BIC**	**df**
m8ipds1_ols	-409.88	27	-294.57	27
m8ipds1_op	52.00	26	163.05	26
m8ipds1_p	104.26	26	215.30	26
m8ipds1_nb	106.26	27	221.57	27
Models	**AIC**	**df**	**BIC**	**df**
m8ipdtp1_ols	-435.03	27	-319.71	27
m8ipdtp1_op	52.00	26	163.05	26
m8ipdtp1_p	106.07	26	217.11	26
m8ipdtp1_nb	108.07	27	223.38	27
Models	**AIC**	**df**	**BIC**	**df**
m8ipdwss2_ols	-36493.40	27	-36378.08	27
m8ipdwss2_op	52.00	26	163.05	26
m8ipdwss2_p	94.00	26	205.05	26
m8ipdwss2_nb	96.00	27	211.32	27
Models	**AIC**	**df**	**BIC**	**df**
m8ipdwstp4_ols	-844.78	26	-733.74	26
m8ipdwstp4_op	50.00	25	156.77	25
m8ipdwstp4_p	107.85	25	214.62	25
m8ipdwstp4_nb	109.85	26	220.90	26
Models	**AIC**	**df**	**BIC**	**df**
m8ipdwfs2_ols	-32949.71	27	-32836.79	27
m8ipdwfs2_op	52.00	26	160.73	26
m8ipdwfs2_p	88.00	26	196.73	26
m8ipdwfs2_nb	90.00	27	202.92	27
Models	**AIC**	**df**	**BIC**	**df**
m8ipdwftp4_ols	-860.25	25	-755.70	25
m8ipdwftp4_op	48.00	24	148.37	24
m8ipdwftp4_p	97.50	24	197.87	24

m8ipdwftp4_nb	99.50	25	204.05	25
Models	**AIC**	**df**	**BIC**	**df**
m8jepa2_ols	-286.29	24	-190.98	24
m8jepa2_op	73.30	23	164.64	23
m8jepa2_p	103.66	23	195.00	23
m8jepa2_nb	105.67	24	200.98	24
Models	**AIC**	**df**	**BIC**	**df**
m8jdi1_ols	-415.18	37	-257.16	37
m8jdi1_op	72.00	36	225.76	36
m8jdi1_p	136.53	36	290.28	36
m8jdi1_nb	138.53	37	296.56	37
Models	**AIC**	**df**	**BIC**	**df**
m8jpdg1_ols	-407.77	27	-292.45	27
m8jpdg1_op	80.92	26	191.96	26
m8jpdg1_p	125.94	26	236.99	26
m8jpdg1_nb	127.94	27	243.26	27
Models	**AIC**	**df**	**BIC**	**df**
m8jpds2_ols	-454.09	27	-338.78	27
m8jpds2_op	70.55	26	181.59	26
m8jpds2_p	117.77	26	228.81	26
m8jpds2_nb	119.77	27	235.09	27
Models	**AIC**	**df**	**BIC**	**df**
m8jpdtp1_ols	-516.45	27	-401.14	27
m8jpdtp1_op	80.84	26	191.89	26
m8jpdtp1_p	125.55	26	236.59	26
m8jpdtp1_nb	127.55	27	242.86	27
Models	**AIC**	**df**	**BIC**	**df**
m8jpdwss1_ols	-34960.14	27	-34844.82	27
m8jpdwss1_op	52.00	26	163.05	26
m8jpdwss1_p	100.00	26	211.05	26
m8jpdwss1_nb	102.00	27	217.32	27
Models	**AIC**	**df**	**BIC**	**df**
m8jpdwstp1_ols	-731.67	26	-620.63	26
m8jpdwstp1_op	50.00	25	156.77	25
m8jpdwstp1_p	104.73	25	211.51	25
m8jpdwstp1_nb	106.73	26	217.78	26
Models	**AIC**	**df**	**BIC**	**df**
m8jpdwfs1_ols	-31674.66	27	-31561.74	27
m8jpdwfs1_op	50.00	25	154.55	25
m8jpdwfs1_p	98.00	26	206.73	26
m8jpdwfs1_nb	100.00	27	212.92	27
Models	**AIC**	**df**	**BIC**	**df**
m8jpdwftp1_ols	-641.98	25	-537.43	25
m8jpdwftp1_op	48.00	24	148.37	24
m8jpdwftp1_p	100.65	24	201.02	24
m8jpdwftp1_nb	102.65	25	207.20	25
Models	**AIC**	**df**	**BIC**	**df**
m8kepa2_ols	-467.71	24	-372.40	24
m8kepa2_op	46.00	23	137.34	23
m8kepa2_p	68.00	23	159.34	23
m8kepa2_nb	70.00	24	165.31	24
Models	**AIC**	**df**	**BIC**	**df**
m8kdi1_ols	-602.71	37	-444.69	37
m8kdi1_op	72.00	36	225.76	36

m8kdi1_p	104.00	36	257.76	36
m8kdi1_nb	106.00	37	264.03	37
Models	**AIC**	**df**	**BIC**	**df**
m8kpdg1_ols	-632.58	28	-512.99	28
m8kpdg1_op	54.00	27	169.32	27
m8kpdg1_p	86.00	27	201.32	27
Models	**AIC**	**df**	**BIC**	**df**
m8kpds1_ols	-654.07	27	-538.75	27
m8kpds1_op	52.00	26	163.05	26
m8kpds1_p	84.00	26	195.05	26
m8kpds1_nb	86.00	27	201.32	27
Models	**AIC**	**df**	**BIC**	**df**
m8kpdtp1_ols	-686.22	27	-570.91	27
m8kpdtp1_op	52.00	26	163.05	26
m8kpdtp1_p	84.00	26	195.05	26
m8kpdtp1_nb	86.00	27	201.32	27
Models	**AIC**	**df**	**BIC**	**df**
m8kpdwss1_ols	-35701.70	27	-35586.38	27
m8kpdwss1_op	52.00	26	163.05	26
m8kpdwss1_p	84.00	26	195.05	26
m8kpdwss1_nb	86.00	27	201.32	27
Models	**AIC**	**df**	**BIC**	**df**
m8kpdwstp1_ols	-905.10	26	-794.06	26
m8kpdwstp1_op	50.00	25	156.77	25
m8kpdwstp1_p	82.10	25	188.88	25
m8kpdwstp1_nb	84.10	26	195.15	26
Models	**AIC**	**df**	**BIC**	**df**
m8kpdwfs1_ols	-31364.84	27	-31251.93	27
m8kpdwfs1_op	50.00	25	154.55	25
m8kpdwfs1_p	82.00	26	190.73	26
m8kpdwfs1_nb	84.00	27	196.92	27
Models	**AIC**	**df**	**BIC**	**df**
m8kpdwftp1_ols	-769.07	25	-664.52	25
m8kpdwftp1_op	48.00	24	148.37	24
m8kpdwftp1_p	78.16	24	178.53	24
m8kpdwftp1_nb	80.16	25	184.71	25
Models	**AIC**	**df**	**BIC**	**df**
m9epa1_ols	1133.33	23	1224.67	23
m9epa1_op	401.46	28	512.65	28
m9epa1_p	520.71	22	608.08	22
m9epa1_nb	506.25	23	597.59	23
m9epa1_hp	459.23	44	633.97	44
m9epa1_hnb	461.23	45	639.94	45
m9epa1_zip	438.49	44	613.22	44
m9epa1_zinb	440.49	45	619.20	45
Models	**AIC**	**df**	**BIC**	**df**
m9di1_ols	1514.28	36	1668.03	36
m9di1_op	550.11	41	725.22	41
m9di1_p	754.63	35	904.12	35
m9di1_nb	741.50	36	895.25	36
m9di1_hp	642.88	70	941.85	70
m9di1_hnb	644.89	71	948.13	71
m9di1_zip	602.61	70	901.58	70
Models	**AIC**	**df**	**BIC**	**df**

m9pdg1_ols	1508.02	27	1623.34	27
m9pdg1_op	545.11	32	681.78	32
m9pdg1_p	784.56	26	895.60	26
m9pdg1_nb	744.09	27	859.40	27
m9pdg1_hp	624.46	52	846.55	52
m9pdg1_hnb	626.46	53	852.82	53
m9pdg1_zip	619.78	52	841.87	52
m9pdg1_zinb	621.78	53	848.15	53
Models	**AIC**	**df**	**BIC**	**df**
m9pds1_ols	1480.07	26	1591.11	26
m9pds1_op	534.21	31	666.61	31
m9pds1_p	783.33	25	890.10	25
m9pds1_nb	735.27	26	846.32	26
m9pds1_hp	625.41	50	838.96	50
m9pds1_hnb	627.41	51	845.23	51
Models	**AIC**	**df**	**BIC**	**df**
m9pds1.2_ols	1481.23	22	1575.19	22
m9pds1.2_op	532.65	27	647.96	27
m9pds1.2_p	796.79	21	886.48	21
m9pds1.2_nb	742.33	22	836.29	22
m9pds1.2_hp	619.50	42	798.89	42
m9pds1.2_hnb	621.50	43	805.16	43
Models	**AIC**	**df**	**BIC**	**df**
m9pdtp1_ols	1507.00	26	1618.05	26
m9pdtp1_op	560.27	31	692.67	31
m9pdtp1_p	795.55	25	902.32	25
m9pdtp1_nb	746.40	26	857.44	26
m9pdtp1_hp	638.16	50	851.71	50
m9pdtp1_hnb	640.16	51	857.98	51
m9pdtp1_zip	632.24	50	845.79	50
m9pdtp1_zinb	634.24	51	852.06	51
Models	**AIC**	**df**	**BIC**	**df**
m9pdwss1_ols	-33038.18	26	-32927.13	26
m9pdwss1_op	62.00	31	194.40	31
m9pdwss1_p	560.16	25	666.93	25
m9pdwss1_nb	562.16	26	673.21	26
m9pdwss1_hp	397.97	50	611.52	50
m9pdwss1_hnb	399.97	51	617.79	51
Models	**AIC**	**df**	**BIC**	**df**
m9pdwstp1_ols	988.96	25	1095.73	25
m9pdwstp1_op	440.19	30	568.32	30
m9pdwstp1_p	543.40	24	645.91	24
m9pdwstp1_nb	545.45	25	652.22	25
m9pdwstp1_hp	528.25	48	733.26	48
m9pdwstp1_hnb	530.25	49	739.53	49
Models	**AIC**	**df**	**BIC**	**df**
m9pdwfs1_ols	-30779.09	26	-30670.35	26
m9pdwfs1_op	62.00	31	191.64	31
m9pdwfs1_p	537.53	25	642.09	25
m9pdwfs1_nb	539.54	26	648.27	26
m9pdwfs1_hp	386.73	50	595.83	50
m9pdwfs1_hnb	388.73	51	602.01	51
Models	**AIC**	**df**	**BIC**	**df**
m9pdwftp1_ols	951.50	24	1051.87	24

m9pdwftp1_op	427.71	29	548.99	29
m9pdwftp1_p	525.22	23	621.40	23
m9pdwftp1_nb	527.26	24	627.63	24
m9pdwftp1_hp	512.23	46	704.60	46
m9pdwftp1_hnb	514.23	47	710.79	47
m9pdwftp1_zip	517.57	46	709.95	46
m9pdwftp1_zinb	519.57	47	716.13	47
Models	**AIC**	**df**	**BIC**	**df**
m10epa1_ols	3323.58	23	3414.92	23
m10epa1_op	1691.72	84	2025.30	84
m10epa1_p	6667.51	22	6754.88	22
m10epa1_nb	2090.04	23	2181.38	23
m10epa1_hp	4157.54	44	4332.28	44
m10epa1_hnb	1881.29	45	2060.00	45
m10epa1_zip	4157.36	44	4332.10	44
m10epa1_zinb	1867.45	45	2046.16	45
Models	**AIC**	**df**	**BIC**	**df**
m10di1_ols	4467.94	36	4621.69	36
m10di1_op	2326.09	105	2774.54	105
m10di1_p	8035.25	35	8184.73	35
m10di1_nb	2876.42	36	3030.18	36
m10di1_hp	4960.01	70	5258.98	70
m10di1_hnb	2559.80	71	2863.04	71
m10di1_zip	4959.94	70	5258.91	70
m10di1_zinb	2542.53	71	2845.77	71
Models	**AIC**	**df**	**BIC**	**df**
m10pdg1_ols	4469.28	27	4584.60	27
m10pdg1_op	2373.64	96	2783.65	96
m10pdg1_p	9376.16	26	9487.20	26
m10pdg1_nb	2877.22	27	2992.54	27
m10pdg1_hp	5457.55	52	5679.64	52
m10pdg1_hnb	2586.19	53	2812.55	53
m10pdg1_zip	5457.54	52	5679.64	52
m10pdg1_zinb	2574.57	53	2800.93	53
Models	**AIC**	**df**	**BIC**	**df**
m10pds1_ols	4448.10	26	4559.15	26
m10pds1_op	2362.44	95	2768.18	95
m10pds1_p	9065.73	25	9172.50	25
m10pds1_nb	2890.37	26	3001.41	26
m10pds1_hp	5375.93	50	5589.48	50
m10pds1_hnb	2582.64	51	2800.46	51
m10pds1_zip	5375.98	50	5589.53	50
m10pds1_zinb	2575.81	51	2793.63	51
Models	**AIC**	**df**	**BIC**	**df**
m10pdtp1_ols	4494.66	26	4605.71	26
m10pdtp1_op	2387.32	95	2793.06	95
m10pdtp1_p	9690.26	25	9797.03	25
m10pdtp1_nb	2892.01	26	3003.05	26
m10pdtp1_hp	5717.76	50	5931.31	50
m10pdtp1_hnb	2590.88	51	2808.70	51
m10pdtp1_zip	5717.76	50	5931.31	50
m10pdtp1_zinb	2579.41	51	2797.23	51
Models	**AIC**	**df**	**BIC**	**df**
m10pdwss1_ols	2822.82	26	2933.87	26

m10pdwss1_op	1471.59	95	1877.34	95
m10pdwss1_p	4499.88	25	4606.65	25
m10pdwss1_nb	4501.77	26	4612.81	26
Models	**AIC**	**df**	**BIC**	**df**
m10pdwstp1_ols	4438.85	25	4545.62	25
m10pdwstp1_op	2394.73	94	2796.20	94
m10pdwstp1_p	9753.01	24	9855.51	24
m10pdwstp1_nb	2909.44	25	3016.21	25
m10pdwstp1_hp	5504.62	48	5709.63	48
m10pdwstp1_hnb	2598.73	49	2808.01	49
m10pdwstp1_zip	5504.62	48	5709.63	48
Models	**AIC**	**df**	**BIC**	**df**
m10pdwfs1_ols	2619.04	26	2727.77	26
m10pdwfs1_op	1432.68	95	1829.98	95
m10pdwfs1_p	4185.61	25	4290.16	25
m10pdwfs1_nb	4187.55	26	4296.29	26
Models	**AIC**	**df**	**BIC**	**df**
m10pdwftp2_ols	4106.92	24	4207.29	24
m10pdwftp2_op	2329.56	93	2718.50	93
m10pdwftp2_p	8955.10	23	9051.29	23
m10pdwftp2_nb	2771.98	24	2872.35	24
m10pdwftp2_hp	5355.16	46	5547.53	46
m10pdwftp2_hnb	2513.01	47	2709.57	47
m10pdwftp2_zip	5355.91	46	5548.29	46
Models	**AIC**	**df**	**BIC**	**df**
m11epa3_ols	2146.17	24	2241.48	24
m11epa3_op	577.59	56	799.98	56
m11epa3_p	972.44	23	1063.78	23
m11epa3_nb	693.90	24	789.21	24
m11epa3_hp	619.92	46	802.59	46
m11epa3_hnb	576.46	47	763.11	47
m11epa3_zip	621.66	46	804.34	46
m11epa3_zinb	576.23	47	762.88	47
Models	**AIC**	**df**	**BIC**	**df**
m11di3_ols	2859.93	37	3017.96	37
m11di3_op	732.19	70	1031.15	70
m11di3_p	1159.83	36	1313.59	36
m11di3_nb	926.51	37	1084.54	37
m11di3_hp	741.62	72	1049.13	72
m11di3_hnb	743.62	73	1055.40	73
m11di3_zip	741.29	72	1048.81	72
Models	**AIC**	**df**	**BIC**	**df**
m11pdg3_ols	2858.82	28	2978.41	28
m11pdg3_op	783.76	61	1044.29	61
m11pdg3_p	1365.60	27	1480.91	27
m11pdg3_hp	854.51	54	1085.15	54
m11pdg3_hnb	791.20	55	1026.11	55
m11pdg3_zip	853.67	54	1084.30	54
m11pdg3_zinb	777.40	55	1012.30	55
Models	**AIC**	**df**	**BIC**	**df**
m11pds1_ols	2844.55	27	2959.87	27
m11pds1_op	769.42	60	1025.68	60
m11pds1_p	1248.20	26	1359.25	26
m11pds1_nb	945.28	27	1060.60	27

m11pds1_hp	828.54	52	1050.63	52
m11pds1_hnb	791.23	53	1017.59	53
m11pds1_zip	829.20	52	1051.29	52
m11pds1_zinb	792.16	53	1018.53	53
Models	**AIC**	**df**	**BIC**	**df**
m11pdtp3_ols	2770.71	27	2886.03	27
m11pdtp3_op	770.92	60	1027.17	60
m11pdtp3_p	1276.70	26	1387.75	26
m11pdtp3_nb	959.38	27	1074.70	27
m11pdtp3_hp	785.06	52	1007.15	52
m11pdtp3_hnb	770.20	53	996.56	53
m11pdtp3_zip	774.56	52	996.66	52
m11pdtp3_zinb	755.21	53	981.57	53
Models	**AIC**	**df**	**BIC**	**df**
m11pdwss1_ols	2359.13	27	2474.44	27
m11pdwss1_op	612.91	60	869.17	60
m11pdwss1_p	996.37	26	1107.41	26
m11pdwss1_nb	868.98	27	984.29	27
m11pdwss1_hp	613.40	52	835.49	52
m11pdwss1_hnb	615.40	53	841.76	53
Models	**AIC**	**df**	**BIC**	**df**
m11pdwstp2_ols	2355.77	26	2466.81	26
m11pdwstp2_op	566.48	59	818.46	59
m11pdwstp2_p	568.58	25	675.36	25
m11pdwstp2_nb	570.59	26	681.63	26
Models	**AIC**	**df**	**BIC**	**df**
m11pdwfs1_ols	2181.76	27	2294.68	27
m11pdwfs1_op	592.90	59	839.65	59
m11pdwfs1_p	941.56	26	1050.30	26
m11pdwfs1_nb	828.55	27	941.47	27
m11pdwfs1_hp	591.42	52	808.89	52
m11pdwfs1_hnb	593.42	53	815.07	53
Models	**AIC**	**df**	**BIC**	**df**
m11pdwfs2_ols	2181.45	27	2294.37	27
m11pdwfs2_op	593.37	59	840.12	59
m11pdwfs2_p	941.00	26	1049.74	26
m11pdwfs2_nb	825.08	27	938.00	27
m11pdwfs2_hp	597.43	52	814.90	52
m11pdwfs2_hnb	599.43	53	821.08	53
Models	**AIC**	**df**	**BIC**	**df**
m11pdwftp2_ols	2158.58	25	2263.14	25
m11pdwftp2_op	534.72	57	773.10	57
m11pdwftp2_p	532.89	24	633.26	24
m11pdwftp2_nb	534.90	25	639.45	25
Models	**AIC**	**df**	**BIC**	**df**
m12aepa1_ols	185.28	24	280.60	24
m12aepa1_p	164.20	23	255.54	23
m12aepa1_nb	166.20	24	261.51	24
Models	**AIC**	**df**	**BIC**	**df**
m12adi1_ols	272.01	37	430.04	37
m12adi1_op	165.44	38	327.74	38
m12adi1_p	233.81	36	387.57	36
m12adi1_nb	235.82	37	393.84	37
m12adi1_hp	238.15	72	545.66	72

m12adi1_hnb	240.32	73	552.10	73
Models	**AIC**	**df**	**BIC**	**df**
m12apdg1_ols	233.15	28	352.74	28
m12apdg1_op	183.18	29	307.04	29
m12apdg1_p	231.52	27	346.84	27
m12apdg1_nb	233.53	28	353.11	28
Models	**AIC**	**df**	**BIC**	**df**
m12apds4_ols	186.71	27	302.02	27
m12apds4_p	224.96	26	336.01	26
m12apds4_nb	226.96	27	342.28	27
Models	**AIC**	**df**	**BIC**	**df**
m12apdtp4_ols	181.60	27	296.92	27
m12apdtp4_p	222.38	26	333.43	26
m12apdtp4_nb	224.39	27	339.70	27
Models	**AIC**	**df**	**BIC**	**df**
m12apdwss1_ols	-82.54	27	32.78	27
m12apdwss1_op	133.82	28	253.40	28
m12apdwss1_p	193.79	26	304.83	26
m12apdwss1_nb	195.80	27	311.11	27
Models	**AIC**	**df**	**BIC**	**df**
m12apdwstp2_ols	-581.60	26	-470.55	26
m12apdwstp2_op	54.00	27	169.32	27
m12apdwstp2_p	164.48	25	271.25	25
m12apdwstp2_nb	166.48	26	277.53	26
Models	**AIC**	**df**	**BIC**	**df**
m12apdwfs1_ols	-59.14	27	53.78	27
m12apdwfs1_op	122.80	27	235.72	27
m12apdwfs1_p	183.54	26	292.28	26
m12apdwfs1_nb	185.55	27	298.47	27
Models	**AIC**	**df**	**BIC**	**df**
m12apdwftp2_ols	-488.03	25	-383.48	25
m12apdwftp2_op	52.00	26	160.73	26
m12apdwftp2_p	155.82	24	256.19	24
m12apdwftp2_nb	157.82	25	262.37	25
Models	**AIC**	**df**	**BIC**	**df**
m12bepa1_ols	668.69	24	764.00	24
m12bepa1_op	171.72	26	274.97	26
m12bepa1_p	194.23	23	285.57	23
m12bepa1_nb	196.23	24	291.54	24
Models	**AIC**	**df**	**BIC**	**df**
m12bdi4_ols	921.23	37	1079.25	37
m12bdi4_op	201.06	40	371.90	40
m12bdi4_p	261.27	36	415.03	36
m12bdi4_nb	263.28	37	421.30	37
Models	**AIC**	**df**	**BIC**	**df**
m12bpdg1_ols	890.94	28	1010.53	28
m12bpdg1_op	240.67	31	373.07	31
m12bpdg1_p	274.90	27	390.22	27
m12bpdg1_nb	276.91	28	396.50	28
Models	**AIC**	**df**	**BIC**	**df**
m12bpds1_ols	863.82	27	979.13	27
m12bpds1_op	241.00	30	369.13	30
m12bpds1_p	280.20	26	391.25	26
m12bpds1_nb	282.20	27	397.52	27

Models	AIC	df	BIC	df
m12bpdtp3_ols	825.43	27	940.75	27
m12bpdtp3_op	213.88	30	342.00	30
m12bpdtp3_p	260.09	26	371.13	26
m12bpdtp3_nb	262.09	27	377.41	27
m12bpdtp3_hp	249.27	52	471.36	52
m12bpdtp3_hnb	251.27	53	477.63	53
Models	**AIC**	**df**	**BIC**	**df**
m12bpdwss1_ols	259.64	27	374.96	27
m12bpdwss1_op	154.38	30	282.51	30
m12bpdwss1_p	206.89	26	317.94	26
m12bpdwss1_nb	208.90	27	324.21	27
Models	**AIC**	**df**	**BIC**	**df**
m12bpdwstp3_ols	456.09	26	567.13	26
m12bpdwstp3_p	187.39	25	294.16	25
m12bpdwstp3_nb	189.39	26	300.44	26
Models	**AIC**	**df**	**BIC**	**df**
m12bpdwfs1_ols	272.44	27	385.36	27
m12bpdwfs1_p	198.08	26	306.82	26
m12bpdwfs1_nb	200.08	27	313.00	27
Models	**AIC**	**df**	**BIC**	**df**
m12bpdwftp3_ols	458.78	25	563.34	25
m12bpdwftp3_p	177.80	24	278.17	24
m12bpdwftp3_nb	179.81	25	284.36	25
Models	**AIC**	**df**	**BIC**	**df**
m12cepa3_ols	978.96	24	1074.27	24
m12cepa3_op	312.31	29	427.48	29
m12cepa3_p	363.58	23	454.92	23
m12cepa3_nb	353.99	24	449.30	24
Models	**AIC**	**df**	**BIC**	**df**
m12cdi4_ols	1310.40	37	1468.42	37
m12cdi4_op	420.66	42	600.04	42
m12cdi4_p	484.23	36	637.99	36
m12cdi4_nb	478.62	37	636.65	37
m12cdi4_hp	470.01	72	777.52	72
m12cdi4_hnb	472.21	73	783.99	73
Models	**AIC**	**df**	**BIC**	**df**
m12cpdg3_ols	1269.15	28	1388.74	28
m12cpdg3_p	542.15	27	657.47	27
m12cpdg3_nb	501.45	28	621.04	28
Models	**AIC**	**df**	**BIC**	**df**
m12cpds3_ols	1250.25	27	1365.56	27
m12cpds3_op	435.07	32	571.74	32
m12cpds3_p	536.57	26	647.62	26
m12cpds3_nb	502.24	27	617.56	27
Models	**AIC**	**df**	**BIC**	**df**
m12cpdtp3_ols	1213.12	27	1328.43	27
m12cpdtp3_op	421.18	32	557.85	32
m12cpdtp3_p	527.07	26	638.12	26
m12cpdtp3_nb	493.13	27	608.45	27
m12cpdtp3_hp	449.73	52	671.82	52
m12cpdtp3_hnb	451.73	53	678.09	53
Models	**AIC**	**df**	**BIC**	**df**
m12cpdwss1_ols	1051.16	27	1166.48	27

m12cpdwss1_op	317.82	32	454.49	32
m12cpdwss1_p	389.60	26	500.64	26
m12cpdwss1_nb	390.75	27	506.06	27
Models	**AIC**	**df**	**BIC**	**df**
m12cpdwstp4_ols	740.16	26	851.21	26
m12cpdwstp4_p	249.00	25	355.77	25
m12cpdwstp4_nb	251.00	26	362.05	26
Models	**AIC**	**df**	**BIC**	**df**
m12cpdwfs1_ols	994.28	27	1107.19	27
m12cpdwfs1_op	299.34	32	433.16	32
m12cpdwfs1_p	369.09	26	477.83	26
m12cpdwfs1_nb	370.90	27	483.82	27
Models	**AIC**	**df**	**BIC**	**df**
m12cpdwftp3_ols	1036.18	25	1140.74	25
m12cpdwftp3_p	315.29	24	415.66	24
m12cpdwftp3_nb	317.29	25	421.84	25
Models	**AIC**	**df**	**BIC**	**df**
m12depa4_ols	-357.34	24	-262.03	24
m12depa4_p	86.59	23	177.93	23
m12depa4_nb	88.59	24	183.90	24
Models	**AIC**	**df**	**BIC**	**df**
m12ddi4_ols	-306.62	37	-148.59	37
m12ddi4_p	164.19	36	317.94	36
m12ddi4_nb	166.19	37	324.22	37
Models	**AIC**	**df**	**BIC**	**df**
m12dpdg3_ols	-344.17	28	-224.59	28
m12dpdg3_p	147.87	27	263.19	27
m12dpdg3_nb	149.87	28	269.46	28
Models	**AIC**	**df**	**BIC**	**df**
m12dpds4_ols	-365.97	27	-250.65	27
m12dpds4_op	77.12	26	188.17	26
m12dpds4_p	155.14	26	266.18	26
m12dpds4_nb	157.14	27	272.46	27
Models	**AIC**	**df**	**BIC**	**df**
m12dpdtp4_ols	-390.72	27	187.21	26
m12dpdtp4_op	76.17	26	262.24	26
m12dpdtp4_p	151.19	26	268.51	27
Models	**AIC**	**df**	**BIC**	**df**
m12dpdwss1_ols	-988.04	27	-872.72	27
m12dpdwss1_p	115.89	26	226.94	26
m12dpdwss1_nb	117.89	27	233.21	27
Models	**AIC**	**df**	**BIC**	**df**
m12dpdwstp2_ols	-35387.66	26	-35276.61	26
m12dpdwstp2_p	110.00	25	216.77	25
m12dpdwstp2_nb	112.00	26	223.05	26
Models	**AIC**	**df**	**BIC**	**df**
m12dpdwfs1_ols	-892.18	27	-779.27	27
m12dpdwfs1_p	113.83	26	222.56	26
m12dpdwfs1_nb	115.83	27	228.74	27
Models	**AIC**	**df**	**BIC**	**df**
m12dpdwftp3_ols	-32681.10	25	-32576.54	25
m12dpdwftp3_p	106.00	24	206.37	24
m12dpdwftp3_nb	108.00	25	212.55	25
Models	**AIC**	**df**	**BIC**	**df**

m12eepa2_ols	802.64	24	897.95	24
m12eepa2_p	162.76	23	254.10	23
m12eepa2_nb	164.78	24	260.09	24
Models	**AIC**	**df**	**BIC**	**df**
m12edi4_ols	1033.33	37	1191.35	37
m12edi4_op	189.79	41	364.90	41
m12edi4_p	226.93	36	380.68	36
m12edi4_nb	228.93	37	386.96	37
Models	**AIC**	**df**	**BIC**	**df**
m12epdg4_ols	1044.76	28	1164.35	28
m12epdg4_op	217.34	32	354.01	32
m12epdg4_p	228.19	27	343.51	27
m12epdg4_nb	230.20	28	349.79	28
Models	**AIC**	**df**	**BIC**	**df**
m12epds4_ols	1006.84	27	1122.15	27
m12epds4_op	206.81	31	339.21	31
m12epds4_p	219.84	26	330.88	26
m12epds4_nb	221.85	27	337.16	27
Models	**AIC**	**df**	**BIC**	**df**
m12epdtp4_ols	946.62	27	1061.94	27
m12epdtp4_op	199.71	31	332.11	31
m12epdtp4_p	219.31	26	330.36	26
m12epdtp4_nb	221.32	27	336.64	27
Models	**AIC**	**df**	**BIC**	**df**
m12epdwss2_ols	374.90	27	490.22	27
m12epdwss2_op	162.63	31	295.03	31
m12epdwss2_p	195.01	26	306.06	26
m12epdwss2_nb	197.02	27	312.33	27
Models	**AIC**	**df**	**BIC**	**df**
m12epdwstp1_ols	454.77	26	565.82	26
m12epdwstp1_p	152.16	25	258.94	25
m12epdwstp1_nb	154.16	26	265.21	26
Models	**AIC**	**df**	**BIC**	**df**
m12epdwfs2_ols	384.08	27	497.00	27
m12epdwfs2_op	155.01	31	284.65	31
m12epdwfs2_p	185.98	26	294.72	26
m12epdwfs2_nb	187.99	27	300.90	27
Models	**AIC**	**df**	**BIC**	**df**
m12epdwftp1_ols	492.32	25	596.87	25
m12epdwftp1_op	78.82	29	200.10	29
m12epdwftp1_p	144.89	24	245.26	24
m12epdwftp1_nb	146.89	25	251.45	25
Models	**AIC**	**df**	**BIC**	**df**
m12fepa3_ols	405.51	24	500.82	24
m12fepa3_p	149.76	23	241.10	23
m12fepa3_nb	151.77	24	247.08	24
Models	**AIC**	**df**	**BIC**	**df**
m12fdi4_ols	510.80	37	668.83	37
m12fdi4_p	184.32	36	338.08	36
m12fdi4_nb	186.32	37	344.35	37
Models	**AIC**	**df**	**BIC**	**df**
m12fpdg2_ols	541.02	28	660.61	28
m12fpdg2_p	209.23	27	324.55	27
m12fpdg2_nb	211.23	28	330.82	28

Models	AIC	df	BIC	df
m12fpds4_ols	483.79	27	599.10	27
m12fpds4_p	196.61	26	307.65	26
m12fpds4_nb	198.61	27	313.93	27
Models	**AIC**	**df**	**BIC**	**df**
m12fpdtp4_ols	406.15	27	521.46	27
m12fpdtp4_p	180.20	26	291.25	26
m12fpdtp4_nb	182.20	27	297.52	27
Models	**AIC**	**df**	**BIC**	**df**
m12fpdwss1_ols	88.47	27	203.79	27
m12fpdwss1_op	100.83	29	224.69	29
m12fpdwss1_p	152.35	26	263.39	26
m12fpdwss1_nb	154.35	27	269.66	27
Models	**AIC**	**df**	**BIC**	**df**
m12fpdwstp2_ols	-67.54	26	43.51	26
m12fpdwstp2_op	56.00	28	175.59	28
m12fpdwstp2_p	131.73	25	238.51	25
m12fpdwstp2_nb	133.73	26	244.78	26
Models	**AIC**	**df**	**BIC**	**df**
m12fpdwfs2_ols	3.16	27	116.08	27
m12fpdwfs2_op	93.96	28	211.06	28
m12fpdwfs2_p	144.64	26	253.37	26
m12fpdwfs2_nb	146.64	27	259.56	27
Models	**AIC**	**df**	**BIC**	**df**
m12fpdwftp1_ols	-389.20	25	-284.65	25
m12fpdwftp1_op	52.00	26	160.73	26
m12fpdwftp1_p	123.83	24	224.20	24
m12fpdwftp1_nb	125.83	25	230.38	25
Models	**AIC**	**df**	**BIC**	**df**
m12gepa3_ols	-949.50	24	-854.19	24
m12gepa3_p	50.00	23	141.34	23
m12gepa3_nb	52.00	24	147.31	24
Models	**AIC**	**df**	**BIC**	**df**
m12gdi4_ols	-1419.17	37	-1261.14	37
m12gdi4_p	76.00	36	229.76	36
m12gdi4_nb	78.00	37	236.03	37
Models	**AIC**	**df**	**BIC**	**df**
m12gpdg3_ols	-1456.84	28	-1337.25	28
m12gpdg3_p	58.00	27	173.32	27
m12gpdg3_nb	60.00	28	179.59	28
Models	**AIC**	**df**	**BIC**	**df**
m12gpds3_ols	-1430.02	27	-1314.71	27
m12gpds3_p	56.00	26	167.05	26
m12gpds3_nb	58.00	27	173.32	27
Models	**AIC**	**df**	**BIC**	**df**
m12gpdtp3_ols	-1429.61	27	-1314.29	27
m12gpdtp3_p	56.00	26	167.05	26
m12gpdtp3_nb	58.00	27	173.32	27
Models	**AIC**	**df**	**BIC**	**df**
m12gpdwss2_ols	-1834.60	27	-1719.29	27
m12gpdwss2_p	56.00	26	167.05	26
m12gpdwss2_nb	58.00	27	173.32	27
Models	**AIC**	**df**	**BIC**	**df**
m12gpdwstp2_ols	-36522.29	26	-36411.25	26

m12gpdwstp2_p	54.00	25	160.77	25
m12gpdwstp2_nb	56.00	26	167.05	26
Models	**AIC**	**df**	**BIC**	**df**
m12gpdwfs2_ols	-1647.43	27	-1534.51	27
m12gpdwfs2_p	56.00	26	164.73	26
m12gpdwfs2_nb	58.00	27	170.92	27
Models	**AIC**	**df**	**BIC**	**df**
m12gpdwftp2_ols	-33957.54	25	-33852.99	25
m12gpdwftp2_p	52.00	24	152.37	24
m12gpdwftp2_nb	54.00	25	158.55	25
Models	**AIC**	**df**	**BIC**	**df**
m12hepa3_ols	-146.62	24	-51.31	24
m12hepa3_op	119.34	24	214.65	24
m12hepa3_p	187.20	23	278.54	23
m12hepa3_nb	189.20	24	284.51	24
Models	**AIC**	**df**	**BIC**	**df**
m12hdi3_ols	-102.94	37	55.09	37
m12hdi3_op	188.24	37	346.27	37
m12hdi3_p	273.88	36	427.63	36
m12hdi3_nb	275.88	37	433.91	37
Models	**AIC**	**df**	**BIC**	**df**
m12hpdg3_ols	-115.59	28	4.00	28
m12hpdg3_op	180.32	28	299.90	28
m12hpdg3_p	263.47	27	378.78	27
m12hpdg3_nb	265.47	28	385.06	28
Models	**AIC**	**df**	**BIC**	**df**
m12hpds3_ols	-124.86	27	-9.54	27
m12hpds3_op	183.28	27	298.59	27
m12hpds3_p	263.55	26	374.59	26
m12hpds3_nb	265.55	27	380.87	27
Models	**AIC**	**df**	**BIC**	**df**
m12hpdtp3_ols	-118.26	27	298.62	27
m12hpdtp3_op	183.31	27	373.43	26
m12hpdtp3_p	262.38	26	379.70	27
Models	**AIC**	**df**	**BIC**	**df**
m12hpdwss1_ols	-265.36	27	-150.05	27
m12hpdwss1_op	137.56	27	252.88	27
m12hpdwss1_p	250.49	26	361.53	26
m12hpdwss1_nb	252.49	27	367.81	27
Models	**AIC**	**df**	**BIC**	**df**
m12hpdwstp3_ols	-1176.88	26	-1065.83	26
m12hpdwstp3_p	182.01	25	288.78	25
m12hpdwstp3_nb	184.01	26	295.05	26
Models	**AIC**	**df**	**BIC**	**df**
m12hpdwfs1_ols	-202.45	27	-89.53	27
m12hpdwfs1_op	139.63	26	248.36	26
m12hpdwfs1_p	242.05	26	350.79	26
m12hpdwfs1_nb	244.06	27	356.97	27
Models	**AIC**	**df**	**BIC**	**df**
m12hpdwftp3_ols	-1033.65	25	-929.10	25
m12hpdwftp3_p	175.98	24	276.35	24
m12hpdwftp3_nb	177.98	25	282.54	25
Models	**AIC**	**df**	**BIC**	**df**
m12iepa3_ols	878.40	24	973.71	24

m12iepa3_p	104.47	23	195.81	23
m12iepa3_nb	106.47	24	201.78	24
Models	**AIC**	**df**	**BIC**	**df**
m12idi1_ols	1119.52	37	1277.54	37
m12idi1_p	128.84	36	282.60	36
m12idi1_nb	130.84	37	288.87	37
Models	**AIC**	**df**	**BIC**	**df**
m12ipdg3_ols	1081.91	28	1201.50	28
m12ipdg3_op	136.35	32	273.02	32
m12ipdg3_p	166.41	27	281.73	27
m12ipdg3_nb	168.42	28	288.00	28
Models	**AIC**	**df**	**BIC**	**df**
m12ipds1_ols	1065.69	27	1181.01	27
m12ipds1_p	151.02	26	262.07	26
m12ipds1_nb	153.02	27	268.34	27
Models	**AIC**	**df**	**BIC**	**df**
m12ipdtp1_ols	1068.81	27	1184.13	27
m12ipdtp1_op	126.84	31	259.24	31
m12ipdtp1_p	137.42	26	248.47	26
m12ipdtp1_nb	139.43	27	254.75	27
Models	**AIC**	**df**	**BIC**	**df**
m12ipdwss1_ols	662.57	27	777.89	27
m12ipdwss1_p	120.46	26	231.51	26
m12ipdwss1_nb	122.46	27	237.78	27
Models	**AIC**	**df**	**BIC**	**df**
m12ipdwstp1_ols	399.10	26	510.15	26
m12ipdwstp1_p	106.84	25	213.61	25
m12ipdwstp1_nb	108.84	26	219.89	26
Models	**AIC**	**df**	**BIC**	**df**
m12ipdwfs1_ols	562.60	27	675.52	27
m12ipdwfs1_p	99.09	26	207.82	26
m12ipdwfs1_nb	101.09	27	214.01	27
Models	**AIC**	**df**	**BIC**	**df**
m12ipdwftp1_ols	362.20	25	466.75	25
m12ipdwftp1_p	95.09	24	195.46	24
m12ipdwftp1_nb	97.09	25	201.64	25
Models	**AIC**	**df**	**BIC**	**df**
m12jepa2_ols	-282.61	24	-187.30	24
m12jepa2_p	106.03	23	197.37	23
m12jepa2_nb	108.03	24	203.35	24
Models	**AIC**	**df**	**BIC**	**df**
m12jdi1_ols	-405.28	37	-247.26	37
m12jdi1_p	139.08	36	292.83	36
m12jdi1_nb	141.08	37	299.10	37
Models	**AIC**	**df**	**BIC**	**df**
m12jpdg1_ols	-402.82	28	-283.23	28
m12jpdg1_op	80.56	27	195.88	27
m12jpdg1_p	130.29	27	245.61	27
m12jpdg1_nb	132.29	28	251.88	28
Models	**AIC**	**df**	**BIC**	**df**
m12jpds3_ols	-446.60	27	-331.28	27
m12jpds3_p	116.62	26	227.66	26
m12jpds3_nb	118.62	27	233.93	27
Models	**AIC**	**df**	**BIC**	**df**

m12jpdtp2_ols	-518.75	27	-403.43	27
m12jpdtp2_op	78.70	26	189.75	26
m12jpdtp2_p	126.65	26	237.70	26
m12jpdtp2_nb	128.65	27	243.97	27
Models	**AIC**	**df**	**BIC**	**df**
m12jpdwss1_ols	-1829.16	27	-1713.84	27
m12jpdwss1_p	105.33	26	216.38	26
m12jpdwss1_nb	107.34	27	222.65	27
Models	**AIC**	**df**	**BIC**	**df**
m12jpdwstp1_ols	-742.08	26	-631.03	26
m12jpdwstp1_p	105.15	25	211.93	25
m12jpdwstp1_nb	107.16	26	218.20	26
Models	**AIC**	**df**	**BIC**	**df**
m12jpdwfs1_ols	-1628.79	27	-1515.87	27
m12jpdwfs1_p	101.72	26	210.46	26
m12jpdwfs1_nb	103.72	27	216.64	27
Models	**AIC**	**df**	**BIC**	**df**
m12jpdwftp3_ols	-647.25	25	-542.70	25
m12jpdwftp3_p	101.32	24	201.69	24
m12jpdwftp3_nb	103.32	25	207.88	25
Models	**AIC**	**df**	**BIC**	**df**
m12kepa2_ols	-467.71	24	-372.40	24
m12kepa2_p	68.00	23	159.34	23
m12kepa2_nb	70.00	24	165.31	24
Models	**AIC**	**df**	**BIC**	**df**
m12kdi1_ols	-602.71	37	-444.69	37
m12kdi1_p	104.00	36	257.76	36
m12kdi1_nb	106.00	37	264.03	37
Models	**AIC**	**df**	**BIC**	**df**
m12kpdg1_ols	-632.58	28	-512.99	28
m12kpdg1_op	54.00	27	169.32	27
m12kpdg1_p	86.00	27	201.32	27
Models	**AIC**	**df**	**BIC**	**df**
m12kpds1_ols	-654.07	27	-538.75	27
m12kpds1_p	84.00	26	195.05	26
m12kpds1_nb	86.00	27	201.32	27
Models	**AIC**	**df**	**BIC**	**df**
m12kpdtp1_ols	-686.22	27	-570.91	27
m12kpdtp1_p	84.00	26	195.05	26
m12kpdtp1_nb	86.00	27	201.32	27
Models	**AIC**	**df**	**BIC**	**df**
m12kpdwss1_ols	-35701.70	27	-35586.38	27
m12kpdwss1_p	84.00	26	195.05	26
m12kpdwss1_nb	86.00	27	201.32	27
Models	**AIC**	**df**	**BIC**	**df**
m12kpdwstp1_ols	-905.10	26	-794.06	26
m12kpdwstp1_p	82.10	25	188.88	25
m12kpdwstp1_nb	84.10	26	195.15	26
Models	**AIC**	**df**	**BIC**	**df**
m12kpdwfs1_ols	-31364.84	27	-31251.93	27
m12kpdwfs1_p	82.00	26	190.73	26
m12kpdwfs1_nb	84.00	27	196.92	27
Models	**AIC**	**df**	**BIC**	**df**
m12kpdwftp1_ols	-769.07	25	-664.52	25

m12kpdwftp1_p	78.16	24	178.53	24
m12kpdwftp1_nb	80.16	25	184.71	25
Models	**AIC**	**df**	**BIC**	**df**
m12lepa2_ols	1715.52	24	1810.83	24
m12lepa2_p	474.15	23	565.49	23
m12lepa2_nb	438.85	24	534.16	24
Models	**AIC**	**df**	**BIC**	**df**
m12ldi1_ols	2297.83	37	2455.85	37
m12ldi1_op	433.04	55	667.94	55
m12ldi1_p	669.25	36	823.01	36
m12ldi1_nb	607.13	37	765.16	37
Models	**AIC**	**df**	**BIC**	**df**
m12lpdg1_ols	2309.35	28	2428.94	28
m12lpdg1_op	467.66	46	664.12	46
m12lpdg1_p	744.05	27	859.37	27
m12lpdg1_nb	622.75	28	742.34	28
Models	**AIC**	**df**	**BIC**	**df**
m12lpds1_ols	2256.29	27	2371.60	27
m12lpds1_op	450.90	45	643.10	45
m12lpds1_p	707.84	26	818.88	26
m12lpds1_nb	602.00	27	717.32	27
Models	**AIC**	**df**	**BIC**	**df**
m12lpdtp1_ols	2201.57	27	2316.88	27
m12lpdtp1_op	439.85	45	632.04	45
m12lpdtp1_p	715.28	26	826.33	26
m12lpdtp1_nb	611.91	27	727.23	27
Models	**AIC**	**df**	**BIC**	**df**
m12lpdwss1_ols	1973.70	27	2089.02	27
m12lpdwss1_op	404.04	45	596.23	45
m12lpdwss1_p	613.79	26	724.83	26
m12lpdwss1_nb	577.14	27	692.45	27
Models	**AIC**	**df**	**BIC**	**df**
m12lpdwstp1_ols	2054.55	26	2165.60	26
m12lpdwstp1_p	517.39	25	624.17	25
m12lpdwstp1_nb	505.00	26	616.05	26
Models	**AIC**	**df**	**BIC**	**df**
m12lpdwfs1_ols	1823.49	27	1936.41	27
m12lpdwfs1_op	385.79	43	565.62	43
m12lpdwfs1_p	586.48	26	695.21	26
m12lpdwfs1_nb	550.36	27	663.28	27
Models	**AIC**	**df**	**BIC**	**df**
m12lpdwftp2_ols	1913.72	25	2018.27	25
m12lpdwftp2_p	483.83	24	584.20	24
m12lpdwftp2_nb	473.45	25	578.00	25
Models	**AIC**	**df**	**BIC**	**df**
m12mepa1_ols	423.79	24	519.10	24
m12mepa1_op	46.00	23	137.34	23
m12mepa1_p	53.31	23	144.65	23
Models	**AIC**	**df**	**BIC**	**df**
m12mdi1_ols	511.22	37	669.25	37
m12mdi1_p	86.92	36	240.68	36
m12mdi1_nb	88.92	37	246.95	37
Models	**AIC**	**df**	**BIC**	**df**
m12mpdg3_ols	452.94	28	572.53	28

m12mpdg3_p	68.92	27	184.24	27
Models	**AIC**	**df**	**BIC**	**df**
m12mpds1_ols	359.31	27	474.63	27
m12mpds1_p	66.92	26	177.97	26
m12mpds1_nb	68.92	27	184.24	27
Models	**AIC**	**df**	**BIC**	**df**
m12mpdtp1_ols	407.04	27	522.35	27
m12mpdtp1_p	66.92	26	177.97	26
m12mpdtp1_nb	68.92	27	184.24	27
Models	**AIC**	**df**	**BIC**	**df**
m12mpdwss1_ols	436.70	27	552.02	27
m12mpdwss1_p	66.92	26	177.97	26
m12mpdwss1_nb	68.92	27	184.24	27
Models	**AIC**	**df**	**BIC**	**df**
m12mpdwstp1_ols	389.62	26	500.67	26
m12mpdwstp1_p	64.92	25	171.70	25
m12mpdwstp1_nb	66.92	26	177.97	26
Models	**AIC**	**df**	**BIC**	**df**
m12mpdwfs1_ols	439.87	27	552.78	27
m12mpdwfs1_p	66.92	26	175.65	26
m12mpdwfs1_nb	68.92	27	181.84	27
Models	**AIC**	**df**	**BIC**	**df**
m12mpdwftp1_ols	399.62	25	504.17	25
m12mpdwftp1_p	62.92	24	163.29	24
m12mpdwftp1_nb	64.92	25	169.47	25
Models	**AIC**	**df**	**BIC**	**df**
m13ols	320.22	10	363.73	10
m13op	366.42	9	405.57	9
m13p	422.38	9	461.54	9
m13nb	424.40	10	467.91	10
m13hp	384.37	18	462.69	18
m13hnb	386.42	19	469.08	19
m13zip	411.88	18	490.19	18
Models	**AIC**	**df**	**BIC**	**df**
m14aols	1846.61	10	1890.12	10
m14aop	1376.73	14	1437.64	14
m14ap	1442.24	9	1481.40	9
m14anb	1422.30	10	1465.81	10
m14ahp	1336.24	18	1414.55	18
m14ahnb	1338.24	19	1420.90	19
m14azip	1330.31	18	1408.62	18
m14azinb	1332.31	19	1414.97	19
Models	**AIC**	**df**	**BIC**	**df**
m14bols	2042.79	10	2086.30	10
m14bop	804.80	15	870.06	15
m14bp	1158.14	9	1197.29	9
m14bnb	957.60	10	1001.11	10
m14bhp	845.26	18	923.58	18
m14bhnb	847.26	19	929.93	19
m14bzip	844.72	18	923.03	18
m14bzinb	846.72	19	929.38	19
Models	**AIC**	**df**	**BIC**	**df**
m14cols	2650.76	10	2694.27	10
m14cop	1671.17	21	1762.53	21

m14cp	2100.33	9	2139.49	9
m14cnb	1749.12	10	1792.62	10
m14chp	1759.26	18	1837.58	18
m14chnb	1687.43	19	1770.09	19
m14czip	1770.90	18	1849.22	18
m14czinb	1699.21	19	1781.87	19

Appendix 20: Design Regression Tables of the Binary Variables for IPR Scope Mentioned

Dependent Variables	**ipr_m_copyrights_related_rights**			
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests				
ln Charges for the use of IP, receipts (sum)	0.057*** (0.016)	0.012*** (0.003)	-0.337 (15.841)	0.057*** (0.016)
ln Resident applications for patents (sum)	-0.231* (0.096)	-0.034. (0.019)	1.478 (135.411)	-0.231* (0.096)
ln Resident applications for trademarks (sum)	0.312* (0.144)	0.029. (0.017)	1.41 (90.816)	0.312* (0.144)
ln Resident applications for patents (cumulative, sum)	0.308*** (0.093)	0.062** (0.019)	-2.677 (157.533)	0.308*** (0.093)
ln Resident applications for trademarks (cumulative, sum)	-0.422** (0.135)	-0.06*** (0.017)	4.05 (135.275)	-0.422** (0.135)
Number of researchers in R&D (sum)	0.061** (0.023)	0.015** (0.005)	0.132 (12.569)	0.061** (0.023)
Imports of mhtp by PTA members / total mhtp imports	-1.744 (1.956)	-0.918* (0.433)	-3.258 (1172.098)	-1.743 (1.956)
Veto Players				
Veto players (sum)	-0.218*** (0.059)	-0.035*** (0.009)	-1.054 (69.774)	-0.218*** (0.059)
Regime Preference				
Index IPR multilateral coherence (sum)	0.044*** (0.004)	0.01*** (0.001)	0.033 (1.993)	0.044*** (0.004)
Path Dependency				
Index based on binary IPR scope mentioned pl – industrial designs	-0.585. (0.352)	-0.152. (0.079)	0.088 (142.701)	-0.585. (0.352)
Index based on binary IPR scope mentioned pl – patents	0.685. (0.35)	0.173* (0.079)	0.38 (124.377)	0.685. (0.35)
Index based on binary IPR scope mentioned pl – new plant varieties	-0.078* (0.04)	-0.022* (0.009)	-0.455 (30.147)	-0.078* (0.04)
Index based on binary IPR scope mentioned pl – domain names	-0.235. (0.131)	-0.039 (0.026)	-1.285 (86.089)	-0.235. (0.131)
Index IPR general enforcement pd (sum)	0.022. (0.011)	0.004. (0.002)	0.037 (10.201)	0.022. (0.011)
Control Variables				
Democratisation (Polity 2) (mean)	0.024 (0.019)	0.006 (0.004)	0.36 (17.667)	0.024 (0.019)
Classic IP leaders	0.245 (0.317)	0.051 (0.06)	1.312 (210.821)	0.245 (0.317)
Countries with a high increase of patent protection	-0.274 (0.261)	-0.015 (0.046)	0.319 (109.398)	-0.274 (0.261)
New IP producers and developers	0.089 (0.225)	0.038 (0.049)	-1.401 (135.34)	0.089 (0.225)
ln GDP (mean)	-0.184. (0.095)	-0.053** (0.018)	-2.69 (107.051)	-0.184. (0.095)
ln GDPpc (mean)	0.271** (0.102)	0.072*** (0.02)	1.585 (65.561)	0.271** (0.102)

Dependent Variables	**ipr_m_copyrights_related_rights**			
ln Geographic distance (mean)	-0.153. (0.084)	-0.043* (0.018)	-0.413 (45.057)	-0.153. (0.084)
Intercept	–	1.131*** (0.342)	-2.19 (2143.258)	2.172 (1.763)
Model	m3aop_f	m3aols_f	m3ahp_f	m3ahp_f
			Count Data (Stage 2)	Zero Data (Stage 1)
Observations	573	573	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Dependent Variables	ipr_m_trademarks			
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests				
ln Charges for the use of IP, receipts (sum)	0.056*** (0.016)	0.011*** (0.003)	-0.31 (8.132)	0.056*** (0.016)
ln Resident applications for trademarks (sum)	0.157 (0.126)	0.017 (0.016)	1.999 (48.446)	0.157 (0.126)
ln Resident applications for patents (cumulative, sum)	0.094. (0.05)	0.027** (0.01)	-1.587 (25.773)	0.094. (0.05)
ln Resident applications for trademarks (cumulative, sum)	-0.231* (0.117)	-0.04* (0.017)	3.463 (68.111)	-0.231* (0.117)
Number of researchers in R&D (sum)	0.037 (0.024)	0.015** (0.005)	0.525 (8.593)	0.037 (0.024)
Imports of mhtp by PTA members / total mhtp imports	-6.046* (2.391)	-1.479** (0.456)	-3.473 (419.347)	-6.046* (2.39)
Veto Players				
Veto players (sum)	-0.157** (0.057)	-0.026** (0.009)	0.315 (9.929)	-0.157** (0.057)
Regime Preference				
Index IPR multilateral coherence (sum)	0.036*** (0.004)	0.009*** (0.001)	0.035 (0.708)	0.036*** (0.004)
Path Dependency				
Index based on binary IPR scope mentioned pl – patents	0.142** (0.046)	0.038*** (0.009)	-0.204 (8.412)	0.142** (0.046)
Index based on binary IPR scope mentioned pl – new plant varieties	-0.185*** (0.047)	-0.039*** (0.009)	-0.546 (10.645)	-0.185*** (0.047)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	-0.263*** (0.061)	-0.05*** (0.01)	-0.572 (9.673)	-0.263*** (0.061)
Index based on binary IPR scope mentioned pl – domain names	-0.308* (0.136)	-0.04 (0.025)	-0.732 (19.294)	-0.308* (0.136)
Index IPR general enforcement pd (sum)	0.096*** (0.022)	0.014*** (0.003)	0.16 (2.316)	0.096*** (0.022)
Control Variables				
Democratisation (Polity 2) (mean)	0.031. (0.018)	0.008* (0.004)	0.282 (5.914)	0.031. (0.018)
Classic IP leaders	0.242 (0.318)	0.056 (0.06)	0.651 (63.135)	0.242 (0.318)
Countries with a high increase of patent protection	-0.448. (0.27)	-0.032 (0.045)	0.409 (47.577)	-0.448. (0.27)
New IP producers and developers	-0.107 (0.226)	0.005 (0.049)	-0.922 (43.527)	-0.107 (0.226)
ln GDP (mean)	-0.122 (0.092)	-0.039* (0.018)	-2.732 (50.456)	-0.122 (0.092)
ln GDPpc (mean)	0.185. (0.1)	0.053** (0.02)	1.505 (31.199)	0.185. (0.1)
ln Geographic distance (mean)	-0.164. (0.085)	-0.047* (0.018)	-0.162 (20.552)	-0.164. (0.085)
Intercept	–	0.922** (0.327)	-1.942 (635.402)	1.065 (1.688)

Dependent Variables	ipr_m_trademarks			
Model	m3bop_f	m3bols_f	m3bhp_f	m3bhp_f
			Count Data (Stage 2)	Zero Data (Stage 1)
Observations	573	573	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Dependent Variables	ipr_m_geo_indications			
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests				
ln Charges for the use of IP, receipts (sum)	0.069** (0.021)	0.01*** (0.003)	-0.051 (195.3)	0.069** (0.021)
ln Resident applications for patents (cumulative, sum)	0.204** (0.063)	0.038*** (0.009)	-0.586 (564.4)	0.204** (0.063)
ln Resident applications for trademarks (cumulative, sum)	-0.239** (0.079)	-0.039*** (0.011)	4.23 (1340)	-0.239** (0.079)
Number of researchers in R&D (sum)	0.036 (0.029)	0.017*** (0.005)	0.459 (253.9)	0.036 (0.029)
Imports of htp by PTA members (sum)	-0.184** (0.068)	-0.017. (0.01)	0.352 (126.2)	-0.184** (0.068)
Imports of mhtp by PTA members (sum)	0.214*** (0.065)	0.021* (0.01)	-0.553 (185.4)	0.214*** (0.065)
Imports of htp by PTA members / total htp imports	12.546* (5.701)	2.418* (1.026)	5.153 (43180)	12.546* (5.7)
Imports of mhtp by PTA members / total mhtp imports	-17.801** (6.859)	-1.845* (0.83)	-3.652 (33020)	-17.801** (6.859)
Imports of ltp by PTA members / total ltp imports	-6.807 (15.163)	-2.405 (2.242)	-7.556 (116300)	-6.807 (15.163)
Veto Players				
Veto players (sum)	-0.253*** (0.063)	-0.031*** (0.008)	0.177 (433.7)	-0.253*** (0.063)
Regime Preference				
Index IPR multilateral coherence (sum)	0.05*** (0.005)	0.009*** (0.001)	0.008 (17.07)	0.05*** (0.005)
Path Dependency				
Index IPR general pd (sum)	0.063*** (0.018)	0.005* (0.002)	0.005 (67.99)	0.063*** (0.018)
Index based on binary IPR scope mentioned pl – copyrights	-0.45. (0.247)	-0.085* (0.037)	-0.623 (1151)	-0.45. (0.247)
Index based on binary IPR scope mentioned pl – geographical indications	0.253 (0.244)	0.079* (0.037)	0.724 (1081)	0.253 (0.244)
Index based on binary IPR scope mentioned pl – new plant varieties	-0.154** (0.048)	-0.032*** (0.009)	-0.039 (230.3)	-0.154** (0.048)
Index based on binary IPR scope mentioned pl – domain names	-0.556*** (0.165)	-0.056* (0.024)	0.459 (590.2)	-0.556*** (0.165)
Index IPR general enforcement pd (sum)	0.048* (0.021)	0.005 (0.003)	-0.19 (112.9)	0.048* (0.021)
Control Variables				
Democratisation (Polity 2) (mean)	0.11*** (0.026)	0.016*** (0.003)	0.569 (237.2)	0.11*** (0.026)
Classic IP leaders	-0.541 (0.365)	-0.085 (0.056)	-0.486 (1339)	-0.541 (0.365)
Countries with a high increase of patent protection	-0.034 (0.297)	0.013 (0.042)	0.95 (1256)	-0.034 (0.297)
New IP producers and developers	-0.281 (0.259)	-0.007 (0.047)	-0.548 (1132)	-0.281 (0.258)

Dependent Variables	**ipr_m_geo_indications**			
ln GDP (mean)	-0.369*** (0.109)	-0.075*** (0.017)	-3.542 (1122)	-0.369*** (0.109)
ln GDPpc (mean)	0.402*** (0.12)	0.09*** (0.019)	1.172 (622.9)	0.402*** (0.12)
ln Geographic distance (mean)	0.025 (0.098)	-0.004 (0.017)	1.57 (523.8)	0.025 (0.098)
Intercept	–	1.212*** (0.308)	-0.654 (13290)	3.514. (1.943)
Model	m3cop_f	m3cols_f	m3chp_f	m3chp_f
			Count Data (Stage 2)	Zero Data (Stage 1)
Observations	573	573	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Dependent Variables	ipr_m_industrial_designs			
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests				
ln Charges for the use of IP, receipts (sum)	0.035* (0.017)	0.007* (0.003)	-0.095 (9.261)	0.035* (0.017)
ln Resident applications for patents (sum)	-0.198* (0.099)	-0.025 (0.02)	0.568 (46.82)	-0.198* (0.099)
ln Resident applications for trademarks (sum)	0.288* (0.139)	0.027 (0.018)	-0.265 (88.14)	0.288* (0.139)
ln Resident applications for patents (cumulative, sum)	0.292** (0.097)	0.061** (0.02)	-0.069 (33.06)	0.292** (0.097)
ln Resident applications for trademarks (cumulative, sum)	-0.363** (0.131)	-0.055** (0.019)	-0.377 (81.94)	-0.363** (0.131)
Applications for patents by PTA members / total applications for patents	0.43 (0.353)	0.05 (0.074)	0.712 (374.9)	0.43 (0.353)
Applications for industrial designs by PTA members / total applications for industrial designs	-0.263 (0.225)	-0.058 (0.049)	-0.567 (240.8)	-0.263 (0.225)
Applications for patents by PTA members / total applications for patents (cumulative)	-426.6** (152.1)	-46.502** (15.639)	-289.1 (108300)	-426.6** (152.1)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	6.544. (3.664)	0.927 (0.711)	1.589 (1683)	6.544. (3.664)
Number of researchers in R&D (sum)	0.054* (0.023)	0.016** (0.005)	0.178 (10.09)	0.054* (0.023)
Imports of mhtp by PTA members (sum)	0.037* (0.018)	0.007. (0.004)	0.143 (6.224)	0.037* (0.018)
Imports of mhtp by PTA members / total mhtp imports	-8.258** (2.695)	-1.831*** (0.529)	-5.26 (2087)	-8.258** (2.695)
Veto Players				
Veto players (sum)	-0.056 (0.054)	-0.01 (0.01)	0.4 (18.67)	-0.056 (0.054)
Regime Preference				
Index IPR multilateral coherence (sum)	0.021*** (0.003)	0.006*** (0.001)	0.026 (1.091)	0.021*** (0.003)
Path Dependency				
Index based on binary IPR scope mentioned pl – patents	0.143** (0.044)	0.034*** (0.01)	-0.135 (20.12)	0.143** (0.044)
Index based on binary IPR scope mentioned pl – new plant varieties	-0.142*** (0.041)	-0.034*** (0.01)	0.367 (23.16)	-0.142*** (0.041)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	-0.181** (0.062)	-0.039** (0.013)	0.299 (32.89)	-0.181** (0.062)
Index based on binary IPR scope mentioned pl – domain names	-0.247* (0.12)	-0.076** (0.028)	0.27 (73.53)	-0.247* (0.12)
Index IPR general enforcement pd (sum)	0.052*** (0.016)	0.011*** (0.003)	-0.255 (13)	0.052*** (0.016)
Control Variables				
Democratisation (Polity 2) (mean)	0.005 (0.018)	0.004 (0.004)	0.335 (16.56)	0.005 (0.018)

Dependent Variables	**ipr_m_industrial_designs**			
Classic IP leaders	0.204 (0.276)	0.032 (0.065)	-1.156 (99.37)	0.204 (0.276)
Countries with a high increase of patent protection	0.122 (0.245)	0.044 (0.048)	0.455 (192.1)	0.122 (0.245)
New IP producers and developers	0.114 (0.217)	0.037 (0.052)	-0.314 (81.35)	0.114 (0.217)
ln GDP (mean)	-0.313*** (0.091)	-0.084*** (0.019)	-0.687 (47.84)	-0.313*** (0.091)
ln GDPpc (mean)	0.492*** (0.102)	0.112*** (0.022)	0.97 (45.38)	0.492*** (0.102)
ln Geographic distance (mean)	-0.206* (0.085)	-0.057** (0.02)	-0.261 (33.01)	-0.206* (0.085)
Intercept	–	1.577*** (0.367)	0.023 (864.7)	3.327* (1.686)
Model	m3dop_f	m3dols_f	m3dhp_f	m3dhp_f
			Count Data (Stage 2)	Zero Data (Stage 1)
Observations	573	573	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Dependent Variables	ipr_m_patents			
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests				
ln Charges for the use of IP, receipts (sum)	0.051** (0.016)	0.01*** (0.003)	0.041 (6.405)	0.051** (0.016)
ln Resident applications for trademarks (sum)	0.288* (0.134)	0.028. (0.017)	1.008 (46.79)	0.288* (0.134)
ln Resident applications for patents (cumulative, sum)	0.124* (0.051)	0.038*** (0.011)	-0.565 (18.23)	0.124* (0.051)
ln Resident applications for trademarks (cumulative, sum)	-0.364** (0.123)	-0.055** (0.018)	0.65 (43.91)	-0.364** (0.123)
Applications for patents by PTA members / total applications for patents (cumulative)	-336** (126.9)	-42.25** (14.78)	-167.8 (34850)	-336** (126.9)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	2.334 (2.589)	-0.044 (0.476)	0.356 (465.7)	2.334 (2.589)
Number of researchers in R&D (sum)	0.042. (0.023)	0.015** (0.005)	0.213 (6.688)	0.042. (0.023)
Imports of mhtp by PTA members (sum)	0.042* (0.018)	0.008* (0.004)	-0.046 (4.416)	0.042* (0.018)
Imports of mhtp by PTA members / total mhtp imports	-7.086** (2.697)	-1.627** (0.535)	-4.173 (842.6)	-7.087** (2.696)
Veto Players				
Veto players (sum)	-0.147* (0.057)	-0.023* (0.01)	0.299 (12.49)	-0.147* (0.057)
Regime Preference				
Index IPR multilateral coherence (sum)	0.023*** (0.003)	0.006*** (0.001)	0.001 (0.523)	0.023*** (0.003)
Path Dependency				
Index IPR general pd (sum)	-0.017 (0.015)	-0.005. (0.003)	-0.222 (4.864)	-0.017 (0.015)
Index based on binary IPR scope mentioned pl – patents	0.239*** (0.065)	0.058*** (0.013)	0.864 (20.33)	0.239*** (0.065)
Index based on binary IPR scope mentioned pl – new plant varieties	-0.154*** (0.042)	-0.041*** (0.01)	-0.13 (10.56)	-0.154*** (0.042)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	-0.174** (0.06)	-0.045*** (0.013)	-0.058 (12.91)	-0.174** (0.06)
Index based on binary IPR scope mentioned pl – domain names	-0.129 (0.119)	-0.034 (0.027)	0.843 (24.96)	-0.129 (0.119)
Index IPR general enforcement pd (sum)	0.065** (0.022)	0.016*** (0.005)	0.019 (6.582)	0.065** (0.022)
Control Variables				
Democratisation (Polity 2) (mean)	0.003 (0.017)	0.002 (0.004)	0.003 (3.789)	0.003 (0.017)
Classic IP leaders	0.698* (0.304)	0.157* (0.063)	0.251 (45.02)	0.698* (0.304)
Countries with a high increase of patent protection	-0.274 (0.262)	-0.024 (0.047)	-0.072 (67.72)	-0.274 (0.262)
New IP producers and developers	-0.009 (0.221)	0.017 (0.051)	-0.172 (37.38)	-0.009 (0.221)

Dependent Variables	ipr_m_patents			
ln GDP (mean)	-0.24** (0.09)	-0.066*** (0.019)	-1.305 (21.7)	-0.24** (0.09)
ln GDPpc (mean)	0.353*** (0.098)	0.086*** (0.021)	0.786 (20.66)	0.353*** (0.098)
ln Geographic distance (mean)	-0.158. (0.083)	-0.046* (0.019)	0.528 (19.35)	-0.158. (0.083)
Intercept	–	1.283*** (0.346)	-0.583 (339.3)	2.579 (1.601)
Model	m3eop_f	m3eols_f	m3ehp_f	m3ehp_f
			Count Data (Stage 2)	Zero Data (Stage 1)
Observations	573	573	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Dependent Variables	ipr_m_undisclosed_information			
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests				
ln Charges for the use of IP, receipts (sum)	0.065** (0.02)	0.01** (0.003)	-0.089 (100.3)	0.065** (0.02)
ln Resident applications for patents (sum)	-0.275** (0.103)	-0.047* (0.02)	-0.23 (677.4)	-0.275** (0.103)
ln Resident applications for trademarks (sum)	0.447** (0.173)	0.03. (0.017)	0.322 (1553)	0.447** (0.173)
ln Resident applications for patents (cumulative, sum)	0.441*** (0.102)	0.092*** (0.02)	0.21 (630.8)	0.441*** (0.102)
ln Resident applications for trademarks (cumulative, sum)	-0.594*** (0.159)	-0.072*** (0.018)	-0.647 (1459)	-0.594*** (0.159)
Applications for patents by PTA members / total applications for patents (cumulative)	-202.7* (91.11)	-32.31** (12.5)	-121.6 (2492000)	-202.7* (91.11)
Number of researchers in R&D (sum)	0.056* (0.024)	0.014** (0.005)	0.004 (132.5)	0.056* (0.024)
Imports of mhtp by PTA members (sum)	0.084** (0.027)	0.018** (0.006)	0.029 (217)	0.084** (0.027)
Imports of ltp by PTA members (sum)	-0.062* (0.025)	-0.014* (0.006)	-0.057 (217.2)	-0.062* (0.025)
Imports of mltp by PTA members / total mltp imports	-6.432 (8.423)	-1.823 (1.907)	-5.21 (164500)	-6.432 (8.423)
Veto Players				
Veto players (sum)	-0.136** (0.052)	-0.019* (0.009)	-0.133 (920.9)	-0.136** (0.052)
Regime Preference				
Index IPR multilateral coherence (sum)	0.021*** (0.003)	0.006*** (0.001)	0.007 (17.32)	0.021*** (0.003)
Path Dependency				
Index based on binary IPR scope mentioned pl – copyrights	-0.337. (0.185)	-0.105** (0.04)	-0.309 (1755)	-0.337. (0.185)
Index based on binary IPR scope mentioned pl – geographical indications	0.264 (0.185)	0.084* (0.04)	0.204 (2058)	0.264 (0.185)
Index based on binary IPR scope mentioned pl – patents	0.175* (0.075)	0.037* (0.017)	0.153 (1863)	0.175* (0.075)
Index based on binary IPR scope mentioned pl – new plant varieties	-0.029 (0.034)	-0.01 (0.008)	-0.042 (551.1)	-0.029 (0.034)
Index based on binary IPR scope mentioned pl – traditional knowledge & genetic resources	-0.024 (0.026)	-0.005 (0.006)	-0.006 (1261)	-0.024 (0.026)
Index based on binary IPR scope mentioned pl – domain names	-0.043 (0.119)	-0.008 (0.027)	0.047 (2065)	-0.043 (0.119)
Control Variables				
Democratisation (Polity 2) (mean)	0.077** (0.024)	0.011** (0.004)	-0.016 (182)	0.077** (0.024)
Classic IP leaders	0.369 (0.293)	0.096 (0.063)	-0.061 (2656)	0.369 (0.293)
Countries with a high increase of patent protection	0.276 (0.248)	0.041 (0.047)	0.087 (5342)	0.276 (0.248)

Dependent Variables	**ipr_m_undisclosed_information**			
New IP producers and developers	0.105 (0.218)	0.02 (0.05)	-0.025 (2215)	0.105 (0.218)
ln GDP (mean)	-0.275** (0.094)	-0.074*** (0.019)	-0.432 (678)	-0.275** (0.094)
ln GDPpc (mean)	0.252* (0.113)	0.072*** (0.021)	0.193 (732.5)	0.252* (0.113)
ln Geographic distance (mean)	-0.286** (0.089)	-0.069*** (0.019)	-0.37 (549.9)	-0.286** (0.089)
Intercept	–	1.709*** (0.353)	0.849 (12810)	4.41* (1.777)
Model	m3fop_f	m3fols_f	m3fhp_f	m3fhp_f
			Count Data (Stage 2)	Zero Data (Stage 1)
Observations	573	573	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Dependent Variables	ipr_m_layout_design_integ_circuits			
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests				
ln Charges for the use of IP, receipts (sum)	0.061** (0.02)	0.009** (0.003)	-0.106 (139.5)	0.061** (0.02)
ln Resident applications for patents (sum)	-0.269* (0.106)	-0.037. (0.019)	-0.188 (847.3)	-0.269* (0.106)
ln Resident applications for trademarks (sum)	0.435* (0.179)	0.025 (0.016)	0.25 (2067)	0.435* (0.179)
ln Resident applications for patents (cumulative, sum)	0.476*** (0.106)	0.088*** (0.019)	0.236 (828.5)	0.476*** (0.106)
ln Resident applications for trademarks (cumulative, sum)	-0.646*** (0.166)	-0.074*** (0.018)	-0.656 (2105)	-0.646*** (0.166)
Applications for patents by PTA members / total applications for patents	0.696. (0.363)	0.063 (0.069)	0.323 (12590)	0.696. (0.363)
Applications for industrial designs by PTA members / total applications for industrial designs	-0.409. (0.244)	-0.086. (0.047)	-0.043 (7113)	-0.409. (0.244)
Applications for patents by PTA members / total applications for patents (cumulative)	-459.4** (161.1)	-42.3** (14.56)	-264.6 (3238000)	-459.3** (161.1)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	4.951 (3.627)	0.867 (0.642)	1.173 (32750)	4.951 (3.627)
Number of researchers in R&D (sum)	0.051* (0.025)	0.012* (0.005)	-0.003 (171.4)	0.051* (0.025)
Imports of mhtp by PTA members (sum)	0.104*** (0.029)	0.018** (0.006)	0.034 (235.1)	0.104*** (0.029)
Imports of ltp by PTA members (sum)	-0.087** (0.027)	-0.017** (0.005)	-0.062 (238.1)	-0.087** (0.027)
Veto Players				
Veto players (sum)	-0.109. (0.062)	-0.012 (0.009)	-0.124 (1196)	-0.109. (0.062)
Regime Preference				
Index IPR multilateral coherence (sum)	0.027*** (0.004)	0.007*** (0.001)	0.023 (22.42)	0.027*** (0.004)
Path Dependency				
Index based on binary IPR scope mentioned pl – copyrights	-0.102 (0.106)	-0.022 (0.018)	-0.045 (1750)	-0.102 (0.106)
Index based on binary IPR scope mentioned pl – patents	0.21* (0.1)	0.044** (0.016)	0.123 (1698)	0.21* (0.1)
Index based on binary IPR scope mentioned pl – new plant varieties	-0.038 (0.036)	-0.012 (0.008)	-0.067 (649)	-0.038 (0.036)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	0.013 (0.047)	0.003 (0.01)	0.009 (1084)	0.013 (0.047)
Index based on binary IPR scope mentioned pl – domain names	-0.548*** (0.163)	-0.11*** (0.026)	-0.234 (3172)	-0.548*** (0.163)
Control Variables				
Democratisation (Polity 2) (mean)	0.077** (0.024)	0.012*** (0.004)	-0.021 (191.5)	0.077** (0.024)

Dependent Variables	**ipr_m_layout_design_integ_circuits**			
Classic IP leaders	-0.195 (0.285)	-0.069 (0.061)	-0.485 (3893)	-0.195 (0.285)
Countries with a high increase of patent protection	0.289 (0.259)	0.046 (0.044)	0.169 (9139)	0.289 (0.259)
New IP producers and developers	0.261 (0.227)	0.047 (0.049)	-0.006 (2997)	0.261 (0.227)
ln GDP (mean)	-0.385*** (0.098)	-0.094*** (0.018)	-0.606 (917.4)	-0.385*** (0.098)
ln GDPpc (mean)	0.451*** (0.117)	0.106*** (0.02)	0.403 (981.5)	0.451*** (0.117)
ln Geographic distance (mean)	-0.108 (0.092)	-0.038* (0.018)	-0.231 (689.6)	-0.108 (0.092)
Intercept	–	1.724*** (0.344)	1.952 (17000)	4.434* (1.811)
Model	m3gop_f	m3gols_f	m3ghp_f	m3ghp_f
			Count Data (Stage 2)	Zero Data (Stage 1)
Observations	573	573	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Dependent Variables	ipr_m_new_plant_varieties			
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests				
ln Resident applications for patents (sum)	-0.151 (0.109)	-0.008 (0.017)	-0.015 (105.9)	-0.151 (0.109)
ln Resident applications for patents (cumulative, sum)	0.214* (0.105)	0.015 (0.015)	-0.312 (114.8)	0.214* (0.105)
Applications for patents by PTA members / total applications for patents	0.467 (0.341)	0.045 (0.051)	0.707 (394.7)	0.467 (0.342)
Imports of ltp by PTA members (sum)	0.022 (0.017)	0.001 (0.003)	0.197 (11.47)	0.022 (0.017)
Imports of mhtp by PTA members / total mhtp imports	-11.911* (4.92)	-2.356** (0.813)	-11.1 (8281)	-11.911* (4.92)
Imports of mltp by PTA members / total mltp imports	28.183. (16.442)	6.202* (2.932)	26.2 (12630)	28.183. (16.438)
Veto Players				
Veto players (sum)	-0.152. (0.086)	-0.013 (0.008)	-0.031 (122.3)	-0.152. (0.086)
Regime Preference				
Index IPR multilateral coherence (sum)	0.016*** (0.003)	0.004*** (0.001)	0.031 (1.772)	0.016*** (0.003)
Path Dependency				
Index based on binary IPR scope mentioned pl – geographical indications	-0.541* (0.244)	-0.12** (0.043)	-1.248 (183.3)	-0.541* (0.244)
Index based on binary IPR scope mentioned pl – industrial designs	-0.633. (0.38)	-0.14. (0.072)	-0.875 (151.4)	-0.633. (0.38)
Index based on binary IPR scope mentioned pl – patents	0.833* (0.384)	0.174* (0.072)	1.085 (196.8)	0.833* (0.384)
Index based on binary IPR scope mentioned pl – undisclosed information	0.283 (0.236)	0.063 (0.042)	-0.579 (161.8)	0.283 (0.236)
Index based on binary IPR scope mentioned pl – domain names	-0.276* (0.132)	-0.056* (0.024)	1.058 (51.03)	-0.276* (0.131)
Index IPR multilateral coherence pl (dummy sum)	0.008*** (0.002)	0.002*** (0)	0.056 (7.975)	0.008*** (0.002)
Control Variables				
Democratisation (Polity 2) (mean)	0.007 (0.022)	0 (0.003)	-0.284 (10.87)	0.007 (0.022)
Classic IP leaders	-0.296 (0.277)	-0.025 (0.053)	-0.705 (197.7)	-0.296 (0.277)
Countries with a high increase of patent protection	0.277 (0.23)	0.039 (0.039)	0.68 (122.3)	0.277 (0.23)
New IP producers and developers	0.299 (0.231)	0.075. (0.045)	0.483 (70.74)	0.299 (0.231)
ln GDP (mean)	-0.127 (0.109)	-0.018 (0.016)	-0.699 (90.97)	-0.127 (0.109)
ln GDPpc (mean)	0.426*** (0.115)	0.067*** (0.018)	1.016 (68.37)	0.426*** (0.115)
ln Geographic distance (mean)	0.102 (0.096)	0.03. (0.016)	0.879 (51.68)	0.102 (0.096)

Dependent Variables	ipr_m_new_plant_varieties			
Intercept	–	-0.346 (0.302)	-5.896 (1754)	-3.822. (2)
Model	m3hop_f	m3hols_f	m3hzip_f Count Data (Stage 2)	m3hzip_f Zero Data (Stage 1)
Observations	573	573	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Dependent Variables	**ipr_m_trad_knowledge _genetic_resources**	
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests		
ln Resident applications for trademarks (sum)	-0.207. (0.118)	-0.013 (0.01)
ln Resident applications for patents (cumulative, sum)	-0.16 (0.119)	-0.008 (0.006)
ln Resident applications for trademarks (cumulative, sum)	0.518* (0.261)	0.013 (0.01)
Number of researchers in R&D (sum)	0.124* (0.053)	0.001 (0.003)
R&D expenditure (sum)	-0.255 (0.158)	-0.022 (0.013)
Imports of htp by PTA members / total htp imports	-1.298 (4.556)	-0.356 (0.393)
Veto Players		
Veto players (sum)	-0.014 (0.103)	0.007 (0.005)
Regime Preference		
Index IPR multilateral coherence (sum)	0.026*** (0.005)	0.003*** (0)
Path Dependency		
Index based on binary IPR scope mentioned pl – undisclosed information	-0.345 (0.313)	-0.022 (0.019)
Index based on binary IPR scope mentioned pl – layout-designs of integrated circuits	0.011 (0.251)	0.03 (0.019)
Index based on binary IPR scope mentioned pl – new plant varieties	0.474 (0.306)	0.01. (0.006)
Index based on binary IPR scope mentioned pl – traditional knowledge & genetic resources	0.09* (0.045)	0.017*** (0.004)
Index based on binary IPR scope mentioned pl – domain names	0.266 (0.176)	0.065*** (0.016)
Index IPR multilateral coherence pl (dummy sum)	-0.006 (0.004)	-0.001** (0)
Control Variables		
Democratisation (Polity 2) (mean)	-0.015 (0.035)	0.001 (0.002)
Classic IP leaders	-0.473 (0.476)	-0.109** (0.038)
Countries with a high increase of patent protection	0.37 (0.321)	0.037 (0.028)
New IP producers and developers	0.144 (0.339)	0.031 (0.031)
ln GDP (mean)	-0.33 (0.23)	0.002 (0.011)
ln GDPpc (mean)	-0.141 (0.191)	-0.003 (0.013)

Dependent Variables	**ipr_m_trad_knowledge _genetic_resources**	
ln Geographic distance (mean)	0.599** (0.19)	0.034** (0.012)
Intercept	–	-0.254 (0.205)
log(theta)	–	0 (0)
Model	m3iop_f	m3iols_f
Observations	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Dependent Variables	**ipr_m_encrypted_program_carrying_satellite_signals**			
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests				
ln Resident applications for patents (sum)	-0.932*** (0.268)	-0.009 (0.012)	0.079 (42820)	-0.932*** (0.269)
ln Resident applications for trademarks (sum)	0.714* (0.36)	0.008 (0.007)	0.329 (11290)	0.714* (0.36)
ln Resident applications for industrial design (sum)	-0.542. (0.285)	-0.005 (0.01)	-0.069 (53070)	-0.542. (0.285)
ln Resident applications for patents (cumulative, sum)	0.685. (0.357)	0.014 (0.013)	1.318 (52270)	0.685. (0.357)
ln Resident applications for industrial design (cumulative, sum)	-0.318 (0.374)	-0.02. (0.011)	-0.096 (60200)	-0.318 (0.374)
Applications for patents by PTA members / total applications for patents	2.443. (1.403)	0.09* (0.039)	1.754 (18510)	2.443. (1.344)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	-27.342. (16.457)	-0.773** (0.291)	-14.06 (129700)	-27.342. (16.139)
Imports of mhtp by PTA members (sum)	-0.52** (0.158)	-0.017** (0.006)	0.274 (3188)	-0.52*** (0.157)
Imports of mltp by PTA members (sum)	0.559** (0.18)	0.012 (0.008)	0.435 (4475)	0.559** (0.179)
Imports of ltp by PTA members (sum)	0.049 (0.056)	0.008* (0.003)	0.418 (2041)	0.049 (0.056)
Veto Players				
Veto players (sum)	0.319* (0.159)	0 (0.005)	0.498 (7907)	0.319* (0.158)
Regime Preference				
Index IPR multilateral coherence (sum)	0.037*** (0.009)	0.002*** (0)	0.048 (287.9)	0.037*** (0.009)
Path Dependency				
Index based on binary IPR scope mentioned pl – geographical indications	0.304. (0.173)	0.014 (0.009)	0.125 (1951)	0.304. (0.17)
Index based on binary IPR scope mentioned pl – industrial designs	0.124 (0.183)	-0.004 (0.008)	0.262 (5703)	0.124 (0.182)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	-0.139 (0.13)	-0.018** (0.007)	-0.036 (2410)	-0.139 (0.128)
Index based on binary IPR scope mentioned pl – domain names	0.245 (0.256)	0.057*** (0.015)	0.173 (1048)	0.245 (0.253)
Index IPR general enforcement pd (sum)	0.094 (0.059)	0.004* (0.002)	-0.053 (732)	0.094 (0.058)
Index IPR multilateral coherence pl (dummy sum)	-0.052** (0.02)	-0.001* (0)	-0.024 (4.589)	-0.052** (0.019)
Control Variables				
Democratisation (Polity 2) (mean)	0.03 (0.058)	-0.002 (0.002)	-0.442 (695.7)	0.03 (0.058)
Classic IP leaders	-1.389. (0.759)	0.099** (0.036)	-1.625 (21120)	-1.389. (0.759)

Dependent Variables	**ipr_m_encrypted_program_carrying_satellite_signals**			
Countries with a high increase of patent protection	-0.186 (0.465)	-0.022 (0.026)	0.016 (14860)	-0.186 (0.464)
New IP producers and developers	1.327* (0.565)	0.011 (0.029)	0.709 (5517)	1.327* (0.565)
ln GDP (mean)	2.197*** (0.502)	0.054*** (0.011)	0.596 (9364)	2.197*** (0.502)
ln GDPpc (mean)	-0.432 (0.346)	-0.024* (0.012)	-0.423 (11320)	-0.432 (0.346)
ln Geographic distance (mean)	0.13 (0.289)	0.005 (0.011)	-0.028 (12590)	0.13 (0.289)
Intercept	–	-1.134*** (0.214)	-60.52 (37570)	-59.622*** (12.17)
Model	m3jop_f	m3jols_f	m3jhnb_f	m3jhnb_f
			Count Data (Stage 2)	Zero Data (Stage 1)
Observations	573	573	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Dependent Variables	**ipr_m_domain_names**	
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests		
Applications for patents by PTA members / total applications for patents	9.014 (6.291)	0.054 (0.036)
Applications for trademarks by PTA members / total applications for trademarks	-7.027. (3.981)	-0.03 (0.018)
Applications for industrial designs by PTA members / total applications for industrial designs	-2.243 (8.979)	0.048* (0.02)
Applications for patents by PTA members / total applications for patents (cumulative)	207.231 (403.615)	5.263 (6.34)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	-26.018 (83.204)	-0.765** (0.291)
Imports of ltp by PTA members (sum)	0.221** (0.079)	0.003* (0.001)
Veto Players		
Veto players (sum)	0.426 (0.279)	-0.001 (0.005)
Regime Preference		
Index IPR multilateral coherence (sum)	0.032* (0.013)	0.001*** (0)
Path Dependency		
Index IPR general pd (sum)	-0.364* (0.167)	-0.001 (0.001)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	-0.02 (0.636)	-0.005 (0.005)
Index based on binary IPR scope mentioned pl – domain names	0.424 (0.484)	0.056*** (0.011)
Index IPR general enforcement pd (sum)	0.527* (0.266)	0.001 (0.002)
Control Variables		
Democratisation (Polity 2) (mean)	-0.119 (0.088)	-0.001 (0.001)
Classic IP leaders	1.238 (1.131)	0.151*** (0.025)
Countries with a high increase of patent protection	-7.635 (954.704)	-0.045* (0.019)
New IP producers and developers	1.147 (0.707)	0.022 (0.02)
ln GDP (mean)	0.193 (0.397)	0.011. (0.006)
ln GDPpc (mean)	-0.337 (0.529)	-0.017* (0.008)
ln Geographic distance (mean)	0.765. (0.416)	0.013. (0.008)
Intercept	–	-0.229. (0.121)

Dependent Variables	**ipr_m_domain_names**	
Model	m3kop_f	m3kols_f
Observations	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21: Design Regression Tables of the Binary Variables for IPR Scope Tangible

Appendix 21 Design Regression Table 1: Economic Power Asymmetry I

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Economic Power Asymmetry									
GDP asymmetry (max/sum)	0.015 (0.714)	0.825 (0.708)	-0.442 (0.966)	-0.467 (0.666)	-0.467 (0.623)	-0.966 (0.73)	0.127 (0.402)	-0.045 (0.396)	-0.842 (0.673)
GDPpc asymmetry (max/sum)	0.304 (0.888)	-0.819 (0.881)	0.83 (1.202)	0.327 (0.833)	0.529 (0.778)	0.904 (0.908)	-0.169 (0.502)	0.446 (0.494)	0.654 (0.837)
GDP asymmetry * substantial tariff cuts	0.033 (0.094)	-0.013 (0.094)	-0.067 (0.129)	-0.077 (0.108)	-0.049 (0.101)	0.031 (0.097)	0.004 (0.065)	-0.04 (0.064)	0 (0.089)
GDPpc asymmetry * substantial tariff cuts	-0.168 (0.115)	-0.082 (0.115)	0.065 (0.157)	-0.302** (0.109)	0.014 (0.102)	-0.075 (0.118)	-0.126. (0.066)	-0.02 (0.065)	-0.129 (0.109)
GDP asymmetry * ln FDI	0.015 (0.012)	0.006 (0.012)	0 (0.016)	-0.011 (0.011)	-0.014 (0.01)	-0.009 (0.012)	-0.001 (0.007)	-0.004 (0.006)	0.019. (0.011)
GDPpc asymmetry * ln FDI	-0.018 (0.013)	-0.011 (0.013)	-0.006 (0.018)	0.011 (0.012)	0.018 (0.011)	0.009 (0.013)	0.001 (0.007)	0.004 (0.007)	-0.027* (0.012)
GDP asymmetry * lnofficial development assistance and official aid received	-0.013 (0.036)	-0.042 (0.036)	0.025 (0.049)	0.04 (0.034)	0.038 (0.032)	0.059 (0.037)	-0.004 (0.02)	0.007 (0.02)	0.028 (0.034)
GDPpc asymmetry * lnofficial development assistance and official aid received	0.005 (0.046)	0.056 (0.045)	-0.038 (0.062)	-0.022 (0.043)	-0.041 (0.04)	-0.05 (0.047)	0.012 (0.026)	-0.023 (0.025)	-0.01 (0.043)
GDP asymmetry * (DAC aid received by PTA members/ DAC aid received)	-0.05 (0.433)	-0.366 (0.433)	0.226 (0.592)	-0.148 (0.408)	-0.209 (0.382)	0.08 (0.447)	-0.22 (0.246)	-0.16 (0.242)	0.202 (0.408)

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**	**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**
GDPpc asymmetry * (DAC aid received by PTA members/ DAC aid received)	-0.038 (0.56)	0.279 (0.56)	-0.74 (0.765)	0.18 (0.528)	0.348 (0.493)	-0.277 (0.578)	0.208 (0.318)	-0.037 (0.313)	-0.325 (0.527)
Political Pressure									
PTA members on Special 301 Reports (sum)	-0.001 (0.004)	0.009* (0.004)	-0.002 (0.006)	-0.018*** (0.004)	-0.003 (0.004)	0.002 (0.004)	0.002 (0.002)	0.004 (0.002)	0.001 (0.004)
Veto Players									
Veto players (sum)	0.003 (0.004)	0.005 (0.004)	0.01. (0.005)	0.008* (0.004)	-0.005 (0.003)	-0.008* (0.004)	0.002 (0.002)	0.008*** (0.002)	-0.004 (0.004)
Endogeneity									
PTA depth	0.021* (0.009)	0.04*** (0.009)	0.048*** (0.012)	–	–	0.017. (0.009)	–	–	0.035*** (0.009)
Substantial tariff cuts (dummy)	–	–	–	0.241*** (0.063)	0.033 (0.058)	–	0.063. (0.038)	0.053 (0.037)	–
Index IPR enforcement (sum)	0.099*** (0.006)	–	–	–	–	–	–	–	0.008 (0.006)
Index IPR specific enforcement (sum)	–	0.143*** (0.009)	0.093*** (0.012)	0.077*** (0.008)	0.125*** (0.008)	0.069*** (0.009)	0.017*** (0.005)	0.014** (0.005)	–
Regime Preference									
Index IPR multilateral coherence (sum)	0 (0.001)	0.002** (0.001)	0.004*** (0.001)	-0.002*** (0)	-0.002*** (0)	-0.001* (0.001)	-0.001** (0)	0 (0)	0.003*** (0.001)
Control Variables									
Democratisation (Polity 2) (mean)	-0.004. (0.002)	-0.001 (0.002)	-0.001 (0.003)	0.001 (0.002)	-0.001 (0.002)	0.001 (0.002)	0 (0.001)	0 (0.001)	-0.002 (0.002)
Classic IP leaders	-0.109** (0.041)	-0.055 (0.042)	-0.173** (0.057)	0.174*** (0.039)	0.261*** (0.037)	0.161*** (0.043)	0.022 (0.024)	-0.003 (0.023)	-0.136*** (0.039)

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**	**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**
Countries with a high increase of patent protection	-0.015 (0.024)	0.005 (0.024)	0.003 (0.033)	0.076*** (0.023)	0.023 (0.021)	0.076** (0.025)	0.004 (0.014)	-0.001 (0.014)	-0.008 (0.023)
New IP producers and developers	0.02 (0.028)	-0.037 (0.028)	-0.035 (0.039)	-0.06* (0.027)	-0.061* (0.025)	-0.045 (0.029)	-0.016 (0.016)	-0.007 (0.016)	0.054* (0.027)
ln GDP (mean)	0.014 (0.012)	0.006 (0.011)	0.007 (0.016)	-0.037*** (0.011)	-0.012 (0.01)	-0.027* (0.012)	0.001 (0.006)	-0.001 (0.006)	-0.009 (0.011)
ln GDPpc (mean)	-0.036* (0.015)	-0.022 (0.015)	-0.007 (0.02)	0.066*** (0.014)	0.015 (0.013)	0.02 (0.015)	0.007 (0.008)	-0.005 (0.008)	0.001 (0.014)
ln Geographic distance (mean)	-0.001 (0.013)	-0.004 (0.013)	0.07*** (0.017)	-0.006 (0.012)	0.002 (0.011)	-0.007 (0.013)	-0.006 (0.007)	0.001 (0.007)	0.022. (0.012)
Intercept	-0.112 (0.226)	-0.122 (0.225)	-0.711* (0.307)	0.292 (0.215)	0.117 (0.201)	0.465* (0.232)	-0.089 (0.129)	-0.026 (0.127)	-0.008 (0.213)
Model	m8aepa1_ols	m8bepa3_ols	m8cepa3_ols	m8depa4_ols	m8eepa4_ols	m8fepa3_ols	m8gepa4_ols	m8hepa4_ols	m8iepa1_ols
Observations	392	392	392	392	392	392	392	392	392

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 2: Economic Power Asymmetry II

Dependent Variables	**ipr_t_epcss**	**ipr_t_do-main_names**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)
Economic Power Asymmetry		
GDP asymmetry (max/sum)	-0.534 (0.676)	-0.82 (0.536)
GDPpc asymmetry (max/sum)	1.04 (0.844)	1.238. (0.669)
GDP asymmetry * substantial tariff cuts	0.191. (0.109)	0.051 (0.087)
GDPpc asymmetry * substantial tariff cuts	-0.072 (0.11)	0.094 (0.087)
GDP asymmetry * ln FDI	0.016 (0.011)	0.016. (0.009)
GDPpc asymmetry * ln FDI	-0.015 (0.012)	-0.013 (0.01)
GDP asymmetry * lnofficial development assistance and official aid received	0.008 (0.034)	0.024 (0.027)
GDPpc asymmetry * lnofficial develop-ment assistance and official aid received	-0.035 (0.043)	-0.05 (0.034)
GDP asymmetry * (DAC aid received by PTA members/ DAC aid received)	0.249 (0.41)	0.253 (0.325)
GDPpc asymmetry * (DAC aid received by PTA members/ DAC aid received)	-0.128 (0.53)	-0.512 (0.421)

Political Pressure		
PTA members on Special 301 Reports (sum)	0.008. (0.004)	0.004 (0.003)
Veto Players		
Veto players (sum)	-0.012*** (0.004)	-0.009** (0.003)
Endogeneity		
PTA depth	–	–
Substantial tariff cuts (dummy)	-0.115. (0.063)	-0.11* (0.05)
Index IPR enforcement (sum)	0.06*** (0.005)	0.032*** (0.004)
Index IPR specific enforcement (sum)	–	–
Regime Preference		
Index IPR multilateral coherence (sum)	-0.001* (0.001)	0 (0)
Control Variables		
Democratisation (Polity 2) (mean)	-0.002 (0.002)	-0.002 (0.002)
Classic IP leaders	0.053 (0.038)	0.132*** (0.03)
Countries with a high increase of patent protection	0.037 (0.023)	-0.027 (0.018)
New IP producers and developers	0.017 (0.027)	0.031 (0.021)
ln GDP (mean)	-0.003 (0.011)	0.005 (0.009)
ln GDPpc (mean)	-0.035* (0.014)	-0.038*** (0.011)

ln Geographic distance (mean)	0.016 (0.012)	0.009 (0.01)
Intercept	0.262 (0.218)	0.154 (0.173)
Model	m8jepa2_ols	m8kepa2_ols
Observations	392	392

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 3: Domestic Interests I

Dependent Variables	**ipr_t_copyrights_related_rights**			**ipr_t_trade marks**	**ipr_t_geo_indications**		
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests							
ln Charges for the use of IP, receipts (sum)	0 (0.002)	-0.103 (967.3)	-0.062 (0.071)	0.001 (0.002)	0.001 (0.002)	0.036 (1243)	0.061 (0.09)
ln Resident applications for patents (sum)	-0.012 (0.011)	0.127 (11390)	-1.146* (0.517)	-0.01 (0.01)	-0.006 (0.014)	0.217 (9531)	-0.253 (0.332)
ln Resident applications for trademarks (sum)	-0.001 (0.009)	0.163 (3439)	1.708* (0.741)	-0.011 (0.008)	0 (0.012)	0.027 (10210)	0.185 (0.4)
ln Resident applications for industrial design (sum)	-0.011 (0.009)	-0.128 (11340)	-0.538 (0.513)	-0.018* (0.008)	-0.016 (0.011)	0.183 (9152)	-0.054 (0.323)
ln Resident applications for patents (cumulative, sum)	0.01 (0.012)	0.115 (10920)	-0.216 (0.707)	0.015 (0.012)	-0.01 (0.016)	-0.206 (9590)	-0.635 (0.399)
ln Resident applications for trademarks (cumulative, sum)	0.01 (0.01)	-0.194 (7295)	-0.268 (0.682)	0.005 (0.01)	0.016 (0.013)	0.699 (11760)	0.781 (0.486)
ln Resident applications for industrial design (cumulative, sum)	-0.014 (0.011)	0.01 (9034)	-0.065 (0.618)	-0.003 (0.011)	-0.005 (0.015)	-0.18 (7999)	-0.112 (0.367)
Applications for patents by PTA members / total applications for patents	0.008 (0.045)	-0.055 (4991)	-0.377 (1.687)	0.007 (0.042)	0.032 (0.057)	-0.665 (17270)	-1.041 (1.49)
Applications for trademarks by PTA members / total applications for trademarks	-0.047 (0.031)	0.488 (8777)	-1.575 (1.493)	0.035 (0.029)	0.042 (0.04)	1.439 (13200)	1.096 (0.926)
Applications for industrial designs by PTA members / total applications for industrial designs	0.015 (0.027)	-0.516 (5426)	0.447 (1.125)	-0.023 (0.026)	0.041 (0.035)	0.199 (7494)	0.092 (0.66)
Applications for patents by PTA members / total applications for patents (cumulative)	4.55 (8.538)	-322.4 (2191000)	-131.674 (444.068)	9.189 (8.023)	41.047*** (10.911)	148.6 (2185000)	246.7 (167.6)

Dependent Variables	**ipr_t_copyrights_related_rights**			**ipr_t_trade marks**	**ipr_t_geo_indications**		
Applications for trademarks by PTA members / total applications for trademarks (cumulative)	-0.285 (0.327)	-8.097 (131900)	-7.024 (17.568)	-0.738* (0.307)	-1.168** (0.418)	-20.99 (468600)	-32.76* (15.09)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	-0.128 (0.42)	14.09 (190700)	17.067 (21.397)	-0.6 (0.395)	-1.397** (0.537)	-2.749 (206000)	1.214 (11.22)
Number of researchers in R&D (sum)	-0.006. (0.003)	-0.299 (1334)	-0.162 (0.151)	-0.003 (0.003)	0 (0.004)	-0.165 (1535)	-0.018 (0.089)
R&D expenditure (sum)	0.01 (0.012)	0.1 (3061)	0.653 (0.554)	0.017 (0.011)	0 (0.015)	0.106 (3505)	0.301 (0.315)
Imports of htp by PTA members (sum)	0.01 (0.006)	-0.072 (843)	-0.028 (0.232)	0.004 (0.006)	-0.015. (0.008)	-0.264 (1776)	-0.123 (0.118)
Imports of mhtp by PTA members (sum)	-0.012. (0.007)	-0.084 (1332)	-0.259 (0.249)	-0.005 (0.007)	0.016 (0.01)	0.257 (1646)	0.203 (0.144)
Imports of mltp by PTA members (sum)	0.008 (0.008)	-0.148 (1557)	0.475 (0.292)	0.014* (0.007)	-0.012 (0.01)	-0.029 (1814)	-0.092 (0.141)
Imports of ltp by PTA members (sum)	-0.006 (0.004)	0.309 (595.8)	-0.037 (0.116)	-0.014*** (0.004)	0.008 (0.005)	-0.079 (669.9)	0.064 (0.054)
Imports of htp by PTA members / total htp imports	-1.784* (0.894)	-16.17 (129200)	-24.604 (37.013)	-1.971* (0.839)	1.626 (1.141)	-0.832 (216300)	11.2 (16.85)
Imports of mhtp by PTA members / total mhtp imports	0.895 (0.563)	8.917 (189900)	42.74. (24.186)	0.51 (0.523)	-1.074 (0.718)	-17.75 (418200)	-30.98. (17.44)
Imports of mltp by PTA members / total mltp imports	1.408 (3.218)	30.91 (802800)	-148.116 (162.381)	2.654 (3.015)	3.148 (4.108)	87.11 (2237000)	171.1 (107.5)
Imports of ltp by PTA members / total ltp imports	0.753 (2.361)	-23.2 (734600)	93.257 (112.443)	-0.324 (2.216)	-3.567 (3.018)	-62.05 (1921000)	-166.8 (116.8)

Dependent Variables	**ipr_t_copyrights_related_rights**			**ipr_t_trade marks**	**ipr_t_geo_indications**		
Political Pressure							
PTA members on Special 301 Reports (sum)	0.007 (0.005)	-0.18 (1922)	-0.131 (0.264)	0.013** (0.004)	0.006 (0.006)	0.176 (1818)	0.113 (0.115)
Veto Players							
Veto players (sum)	0.015** (0.005)	0.108 (2389)	0.559 (0.355)	0.005 (0.005)	-0.003 (0.007)	-0.384 (2992)	0.016 (0.248)
Endogeneity							
PTA depth	0.009 (0.007)	0.254 (2194)	0.384 (0.26)	–	0.052*** (0.009)	0.316 (1832)	0.399** (0.131)
Index IPR enforcement (sum)	0.084*** (0.005)	1.096 (1072)	0.753*** (0.214)	0.09*** (0.005)	–	–	–
Regime Preference							
Index IPR multilateral coherence (sum)	0.001* (0.001)	0.046 (107.4)	0.037* (0.018)	0.001* (0)	0.002*** (0.001)	-0.037 (139.5)	0.018* (0.008)
Control Variables							
Democratisation (Polity 2) (mean)	-0.003 (0.002)	-0.198 (300.6)	-0.05 (0.111)	-0.002 (0.002)	0.004 (0.003)	0.082 (876.4)	0.028 (0.055)
Classic IP leaders	-0.066. (0.037)	0.083 (9352)	0.062 (1.123)	-0.051 (0.035)	-0.044 (0.049)	0.588 (10840)	1.429* (0.722)
Countries with a high increase of patent protection	-0.044. (0.025)	-0.05 (7373)	-2.036. (1.082)	-0.001 (0.024)	0 (0.032)	0.138 (10510)	-0.206 (0.424)
New IP producers and developers	-0.009 (0.029)	0.032 (4105)	1.863. (0.991)	-0.057* (0.027)	0.005 (0.036)	0.011 (5712)	0.328 (0.499)
ln GDP (mean)	0.049*** (0.01)	-0.244 (7183)	2.218** (0.774)	0.035*** (0.01)	0.021 (0.013)	-0.815 (5037)	0.171 (0.324)

Dependent Variables	**ipr_t_copyrights_related_rights**			**ipr_t_trade marks**	**ipr_t_geo_indications**		
ln GDPpc (mean)	-0.041*** (0.011)	-0.274 (3492)	-0.207 (0.547)	-0.026* (0.011)	-0.018 (0.015)	-0.283 (5027)	-0.179 (0.307)
ln Geographic distance (mean)	-0.006 (0.01)	-0.25 (3326)	-0.428 (0.393)	-0.001 (0.01)	0.054*** (0.013)	0.404 (4269)	0.825** (0.267)
Intercept	-0.811*** (0.202)	-13.23 (125200)	-57.922** (21.39)	-0.586** (0.192)	-0.766** (0.257)	-6.915 (113900)	-16.9* (7.256)
Model	m8adi1_ols	m8adi1_hp Count Data (Stage 2)	m8adi1_hp Zero Data (Stage 1)	m8bdi2_ols	m8cdi3_ols	m8cdi3_hp Count Data (Stage 2)	m8cdi3_hp Zero Data (Stage 1)
Observations	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 4: Domestic Interests II

Dependent Variables	**ipr_t_industrial_designs**			**ipr_t_patents**			**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests									
ln Charges for the use of IP, receipts (sum)	-0.003. (0.002)	1.086 (780)	-0.815. (0.473)	-0.001 (0.002)	-0.385 (3170)	-0.116 (0.072)	0.001 (0.002)	0 (0.001)	-0.002 (0.001)
ln Resident applications for patents (sum)	-0.005 (0.011)	-0.053 (13490)	-4.03 (4.35)	-0.006 (0.01)	0.887 (40700)	-0.363 (0.563)	-0.008 (0.011)	-0.004 (0.006)	-0.003 (0.009)
ln Resident applications for trademarks (sum)	0.003 (0.009)	-0.241 (3492)	1.854 (1.889)	0.002 (0.008)	-0.134 (27690)	0.044 (0.6)	-0.005 (0.009)	0.003 (0.005)	-0.002 (0.007)
ln Resident applications for industrial design (sum)	0.003 (0.009)	-0.063 (7642)	2.15 (5.049)	-0.004 (0.008)	-0.422 (35320)	-0.348 (0.434)	-0.003 (0.009)	0.002 (0.005)	0 (0.007)
ln Resident applications for patents (cumulative, sum)	-0.003 (0.012)	0.089 (8807)	-2.355 (5.761)	0.011 (0.011)	0.66 (44220)	-0.27 (0.737)	0.011 (0.012)	0.008 (0.006)	0.002 (0.01)
ln Resident applications for trademarks (cumulative, sum)	0.003 (0.01)	-0.23 (4810)	-2.385 (2.457)	0.001 (0.009)	-0.051 (35480)	0.408 (0.737)	-0.002 (0.01)	-0.008 (0.005)	-0.004 (0.008)
ln Resident applications for industrial design (cumulative, sum)	0.016 (0.011)	0.99 (3385)	6.336 (6.949)	-0.001 (0.01)	0.317 (37190)	0.217 (0.533)	0.007 (0.012)	-0.003 (0.006)	0.005 (0.009)
Applications for patents by PTA members / total applications for patents	-0.01 (0.045)	0.32 (2399)	-6.027 (5.418)	-0.098* (0.041)	-0.805 (21250)	-1.544 (1.185)	-0.057 (0.046)	-0.048* (0.024)	0.033 (0.035)
Applications for trademarks by PTA members / total applications for trademarks	-0.005 (0.031)	0.453 (6882)	7.136 (4.823)	-0.004 (0.029)	0.275 (36800)	-0.712 (1.027)	-0.043 (0.032)	0.035* (0.016)	0.016 (0.024)
Applications for industrial designs by PTA members / total applications for industrial designs	-0.033 (0.028)	-0.476 (1757)	-1.166 (3.556)	0.035 (0.025)	-0.131 (23100)	0.996 (1.402)	0.114*** (0.028)	-0.022 (0.014)	-0.036. (0.021)

Dependent Variables	**ipr_t_industrial_designs**			**ipr_t_patents**			**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**
Applications for patents by PTA members / total applications for patents (cumulative)	-9.569 (8.602)	-491.2 (823100)	601.8 (689.1)	3.861 (7.81)	-137 (7740000)	-120.664 (194.911)	0.07 (8.761)	-0.216 (4.47)	-8.25 (6.639)
Applications for trademarks by PTA members / total applications for trademarks (cumulative)	0.207 (0.33)	7.455 (69740)	80.44 (49.77)	0.145 (0.299)	10.3 (443500)	24.491* (10.874)	-0.105 (0.336)	-0.153 (0.171)	0.144 (0.254)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	0.484 (0.423)	-3.551 (49240)	-92.41 (86.31)	-0.165 (0.384)	-0.223 (782000)	-5.157 (19.704)	-0.398 (0.431)	0.214 (0.22)	-0.052 (0.327)
Number of researchers in R&D (sum)	-0.001 (0.003)	-0.163 (1692)	0.082 (0.365)	-0.001 (0.003)	-0.13 (5358)	-0.115 (0.116)	-0.003 (0.003)	-0.001 (0.002)	0 (0.002)
R&D expenditure (sum)	0.01 (0.012)	-0.209 (2679)	0.792 (1.607)	0.002 (0.011)	-0.075 (16900)	0.299 (0.427)	-0.001 (0.012)	-0.004 (0.006)	-0.001 (0.009)
Imports of htp by PTA members (sum)	0.003 (0.006)	-0.146 (203.6)	0.372 (0.38)	0.001 (0.006)	-0.315 (1447)	0.146 (0.153)	0.008 (0.006)	-0.001 (0.003)	-0.004 (0.005)
Imports of mhtp by PTA members (sum)	-0.002 (0.008)	0.186 (364.4)	0.401 (0.671)	0.001 (0.007)	0.22 (3195)	0.104 (0.231)	-0.001 (0.008)	0 (0.004)	0.008 (0.006)
Imports of mltp by PTA members (sum)	0.005 (0.008)	-0.108 (484.1)	-0.432 (0.695)	-0.001 (0.007)	-0.039 (3472)	-0.302 (0.26)	0.003 (0.008)	0.007. (0.004)	0.008 (0.006)
Imports of ltp by PTA members (sum)	-0.002 (0.004)	0.129 (177.6)	0.08 (0.314)	0.002 (0.004)	0.02 (1032)	0.146. (0.088)	-0.007 (0.004)	-0.003 (0.002)	-0.011*** (0.003)
Imports of htp by PTA members / total htp imports	-0.152 (0.899)	1.654 (17690)	241.6 (152.1)	-1.638* (0.817)	-9.41 (307800)	-27.097 (24.42)	-0.512 (0.916)	-0.511 (0.467)	0.437 (0.694)
Imports of mhtp by PTA members / total mhtp imports	0.745 (0.558)	-5.992 (29900)	-132.6 (89.68)	0.701 (0.514)	2.596 (431000)	-4.384 (26.497)	0.914 (0.577)	0.098 (0.29)	-0.037 (0.43)
Imports of mltp by PTA members / total mltp imports	-1.905 (3.227)	28 (108200)	-227.1 (348.6)	-0.101 (2.941)	27.65 (1796000)	113.283 (151.974)	-3.826 (3.299)	0.555 (1.677)	-0.717 (2.49)

Dependent Variables	**ipr_t_industrial_designs**			**ipr_t_patents**			**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**
Imports of ltp by PTA members / total ltp imports	-1.326 (2.376)	-24.96 (151500)	-72.57 (294.7)	1.639 (2.16)	-4.613 (1492000)	-22.394 (97.761)	0.633 (2.424)	-0.748 (1.235)	-0.792 (1.834)
Political Pressure									
PTA members on Special 301 Reports (sum)	-0.014** (0.005)	0.028 (177.5)	-0.801 (0.701)	-0.006 (0.004)	-0.578 (3742)	-0.183 (0.17)	0.003 (0.005)	0.004 (0.002)	0.007. (0.004)
Veto Players									
Veto players (sum)	0.009. (0.006)	-0.251 (1768)	-1.1 (0.949)	0.004 (0.005)	0.055 (6017)	0.272 (0.268)	-0.006 (0.006)	0.001 (0.003)	-0.001 (0.004)
Endogeneity									
PTA depth	–	–	–	-0.009 (0.006)	1.619 (5328)	-0.057 (0.201)	0.01 (0.007)	–	–
Index IPR enforcement (sum)	–	–	–	–	–	–	–	–	–
Regime Preference									
Index IPR multilateral coherence (sum)	-0.001** (0)	-0.041 (93.34)	-0.163* (0.078)	-0.001* (0)	-0.118 (389.7)	-0.023 (0.016)	-0.001 (0.001)	-0.001** (0)	0 (0)
Control Variables									
Democratisation (Polity 2) (mean)	-0.003 (0.002)	0.314 (363.6)	0.005 (0.191)	-0.003. (0.002)	0.072 (1017)	-0.051 (0.072)	-0.002 (0.002)	0 (0.001)	0 (0.002)
Classic IP leaders	0.167*** (0.038)	1.724 (7706)	20.41* (9.767)	0.126*** (0.035)	0.57 (24720)	0.464 (0.894)	0.102** (0.039)	-0.003 (0.02)	0 (0.029)
Countries with a high increase of patent protection	0.087*** (0.025)	1.198 (5327)	15.08* (6.627)	-0.016 (0.023)	0.391 (18270)	-0.24 (0.765)	0.051. (0.026)	0.005 (0.013)	0.02 (0.02)
New IP producers and developers	-0.073** (0.028)	0.053 (2176)	-7.553. (3.988)	-0.046. (0.026)	0.261 (12880)	0.012 (0.84)	-0.086** (0.029)	-0.015 (0.015)	0.019 (0.022)

Dependent Variables	**ipr_t_industrial_designs**			**ipr_t_patents**			**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**
ln GDP (mean)	-0.056*** (0.01)	-1.312 (1757)	-2.237 (1.637)	-0.002 (0.009)	-0.319 (18340)	1.431* (0.636)	-0.01 (0.01)	0 (0.005)	-0.011 (0.008)
ln GDPpc (mean)	0.046*** (0.012)	-0.203 (4563)	1.996 (1.416)	0.012 (0.01)	-0.538 (14990)	0.671 (0.43)	0.003 (0.012)	-0.002 (0.006)	0.002 (0.009)
ln Geographic distance (mean)	-0.026* (0.01)	-0.494 (729)	-6.127* (2.862)	-0.008 (0.009)	-0.09 (5450)	0.268 (0.328)	-0.005 (0.01)	-0.006 (0.005)	0.008 (0.008)
Intercept	-0.003 (0.002)	0.314 (363.6)	0.005 (0.191)	-0.003. (0.002)	0.072 (1017)	-0.051 (0.072)	-0.002 (0.002)	0 (0.001)	0 (0.002)
Model	m8ddi4_ols	m8ddi4_hp Count Data (Stage 2)	m8ddi4_hp Zero Data (Stage 1)	m8edi3_ols	m8edi3_hp Count Data (Stage 2)	m8edi3_hp Zero Data (Stage 1)	m8fdi3_ols	m8gdi4_ols	m8hdi4_ols
Observations	529	529	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 5: Domestic Interests III

Dependent Variables	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_do-main_names**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests			
ln Charges for the use of IP, receipts (sum)	-0.003. (0.002)	0.003. (0.001)	0.001 (0.001)
ln Resident applications for patents (sum)	0.001 (0.01)	-0.009 (0.01)	-0.006 (0.008)
ln Resident applications for trademarks (sum)	-0.005 (0.008)	0.011 (0.008)	0.007 (0.007)
ln Resident applications for industrial design (sum)	0.001 (0.008)	-0.003 (0.008)	-0.004 (0.006)
ln Resident applications for patents (cumulative, sum)	-0.022. (0.011)	0.017 (0.011)	0.009 (0.009)
ln Resident applications for trademarks (cumulative, sum)	0.016. (0.009)	-0.01 (0.009)	0 (0.007)
ln Resident applications for industrial design (cumulative, sum)	0.002 (0.011)	-0.018. (0.01)	-0.014. (0.008)
Applications for patents by PTA members / total applications for patents	0.084* (0.042)	0.054 (0.04)	0.089** (0.033)
Applications for trademarks by PTA members / total applications for trademarks	-0.032 (0.029)	-0.03 (0.027)	-0.062** (0.023)
Applications for industrial designs by PTA members / total applications for industrial designs	-0.029 (0.026)	0.007 (0.024)	0.009 (0.02)

Dependent Variables	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_do-main_names**
Applications for patents by PTA members / total applications for patents (cumulative)	-3.741 (7.964)	8.777 (7.523)	11.13. (6.301)
Applications for trademarks by PTA members / total applications for trademarks (cumulative)	-0.028 (0.305)	-0.049 (0.288)	0.045 (0.241)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	0.204 (0.392)	-0.196 (0.37)	-0.359 (0.31)
Number of researchers in R&D (sum)	-0.001 (0.003)	-0.002 (0.003)	0 (0.002)
R&D expenditure (sum)	-0.013 (0.011)	0.002 (0.01)	0.007 (0.009)
Imports of htp by PTA members (sum)	0.013* (0.006)	-0.002 (0.006)	-0.006 (0.005)
Imports of mhtp by PTA members (sum)	-0.004 (0.007)	-0.017* (0.007)	-0.006 (0.006)
Imports of mltp by PTA members (sum)	-0.009 (0.007)	0.003 (0.007)	0 (0.006)
Imports of ltp by PTA members (sum)	-0.001 (0.004)	0.012** (0.004)	0.008** (0.003)
Imports of htp by PTA members / total htp imports	-1.742* (0.834)	-0.45 (0.788)	-0.003 (0.66)
Imports of mhtp by PTA members / total mhtp imports	0.453 (0.525)	-0.416 (0.496)	-0.573 (0.415)
Imports of mltp by PTA members / total mltp imports	4.868 (3.001)	6.069* (2.835)	4.274. (2.375)

Dependent Variables	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_do-main_names**
Imports of ltp by PTA members / total ltp imports	-2.627 (2.202)	-1.793 (2.08)	-0.145 (1.742)
Political Pressure			
PTA members on Special 301 Reports (sum)	0.005 (0.004)	0.008. (0.004)	0.007. (0.003)
Veto Players			
Veto players (sum)	0.01. (0.005)	-0.011* (0.005)	-0.006 (0.004)
Endogeneity			
PTA depth	0.02** (0.007)	-0.001 (0.006)	-0.008 (0.005)
Index IPR enforcement (sum)	0.006 (0.005)	0.048*** (0.005)	0.033*** (0.004)
Regime Preference			
Index IPR multilateral coherence (sum)	0.003*** (0)	0 (0)	0 (0)
Control Variables			
Democratisation (Polity 2) (mean)	0 (0.002)	-0.001 (0.002)	-0.001 (0.001)
Classic IP leaders	-0.073* (0.035)	0.025 (0.033)	0.087** (0.027)
Countries with a high increase of patent protection	0.011 (0.024)	0.012 (0.022)	-0.048* (0.019)
New IP producers and developers	0.093*** (0.027)	-0.017 (0.025)	0.024 (0.021)

Dependent Variables	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_do-main_names**
ln GDP (mean)	0.005 (0.009)	0.034*** (0.009)	0.026*** (0.007)
ln GDPpc (mean)	-0.014 (0.011)	-0.018. (0.01)	-0.022** (0.008)
ln Geographic distance (mean)	0.013 (0.009)	0.013 (0.009)	0.012 (0.007)
Intercept	-0.087 (0.189)	-0.708*** (0.178)	-0.513*** (0.149)
Model	m8idi1_ols	m8jdi1_ols	m8kdi1_ols
Observations	529	529	529

Appendix 21 Design Regression Table 6: Path Dependency (general) I

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**	**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure									
PTA members on Special 301 Reports (sum)	0.003 (0.005)	0.009. (0.005)	-0.001 (0.006)	-0.001 (0.005)	-0.005 (0.004)	0.008. (0.005)	0.006* (0.002)	0.003 (0.004)	0 (0.004)
Veto Players									
Veto players (sum)	0.007 (0.006)	0.008 (0.005)	-0.008 (0.007)	-0.013* (0.006)	-0.001 (0.005)	-0.016** (0.006)	0.002 (0.003)	0.005 (0.004)	0.006 (0.005)
Endogeneity									
PTA depth	–	–	0.046*** (0.009)	–	-0.008 (0.006)	0.019** (0.007)	–	-0.001 (0.005)	0.01 (0.007)
Substantial tariff cuts (dummy)	-0.037. (0.021)	-0.048* (0.021)	–	-0.012 (0.021)	–	–	-0.01 (0.011)	–	–
Index IPR enforcement (sum)	0.088*** (0.005)	0.094*** (0.005)	–	–	–	–	–	–	0.005 (0.005)
Index IPR specific enforcement (sum)	–	–	0.083*** (0.01)	0.094*** (0.008)	0.146*** (0.007)	0.069*** (0.008)	0.021*** (0.004)	0.033*** (0.006)	–
Regime Preference									
Index IPR multilateral coherence (sum)	0.001. (0)	0.001 (0)	0.001* (0.001)	-0.001* (0)	-0.001. (0)	0 (0)	-0.001** (0)	0 (0)	0.002*** (0)
Path Dependency									
Index IPR general pd (sum)	0.003. (0.002)	0.001 (0.002)	0.004. (0.002)	0.004* (0.002)	0 (0.002)	0.006** (0.002)	-0.001. (0.001)	0 (0.001)	-0.001 (0.002)

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**
Index based on binary IPR scope mentioned pl – copyrights	0.016 (0.025)	0.015 (0.024)	0.008 (0.032)	-0.025 (0.024)	-0.009 (0.023)	-0.049. (0.026)	0.013 (0.012)	-0.016 (0.019)	0.002 (0.023)
Index based on binary IPR scope mentioned pl – trademarks	-0.01 (0.035)	0.037 (0.034)	0.003 (0.046)	0.004 (0.035)	0.013 (0.032)	-0.039 (0.036)	-0.009 (0.018)	-0.011 (0.027)	0.057. (0.032)
Index based on binary IPR scope mentioned pl – geographical indications	-0.053* (0.025)	-0.051* (0.024)	0.029 (0.032)	0.034 (0.024)	-0.02 (0.022)	-0.031 (0.025)	-0.035** (0.012)	0.02 (0.019)	0.019 (0.023)
Index based on binary IPR scope mentioned pl – industrial designs	0.043 (0.044)	0.022 (0.043)	0.132* (0.057)	0 (0.044)	-0.08* (0.04)	-0.018 (0.045)	-0.006 (0.022)	-0.035 (0.034)	0.058 (0.041)
Index based on binary IPR scope mentioned pl – patents	-0.055 (0.05)	-0.073 (0.048)	-0.155* (0.065)	-0.007 (0.049)	0.061 (0.045)	0.036 (0.051)	0.019 (0.025)	0.04 (0.039)	-0.117* (0.046)
Index based on binary IPR scope mentioned pl – undisclosed information	0.014 (0.032)	-0.004 (0.031)	-0.057 (0.042)	-0.027 (0.031)	0.036 (0.029)	0.036 (0.033)	0.048** (0.016)	0.024 (0.025)	-0.078** (0.03)
Index based on binary IPR scope mentioned pl – layout-designs of integrated circuits	0.038. (0.02)	0.052** (0.02)	0.01 (0.026)	0.021 (0.02)	0.01 (0.018)	0.03 (0.021)	-0.013 (0.01)	-0.003 (0.016)	0.066*** (0.019)
Index based on binary IPR scope mentioned pl – new plant varieties	0.006 (0.006)	-0.001 (0.005)	0.004 (0.007)	0.012* (0.006)	-0.011* (0.005)	0.004 (0.006)	-0.01*** (0.003)	-0.008. (0.004)	0.006 (0.005)
Index based on binary IPR scope mentioned pl – traditional knowledge & genetic resources	0.015*** (0.004)	-0.004 (0.004)	-0.015** (0.005)	0.011* (0.004)	0.004 (0.004)	0.001 (0.004)	-0.001 (0.002)	-0.003 (0.003)	0.013*** (0.004)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	0.006 (0.007)	-0.021** (0.007)	0.001 (0.01)	0 (0.007)	-0.021** (0.007)	0.002 (0.008)	-0.017*** (0.004)	-0.019** (0.006)	0.007 (0.007)
Index based on binary IPR scope mentioned pl – domain names	0.035* (0.016)	0.031. (0.016)	0.043* (0.021)	-0.028. (0.016)	-0.05*** (0.015)	-0.07*** (0.017)	-0.015. (0.008)	-0.004 (0.013)	0.091*** (0.015)

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**
Index IPR general enforcement pd (sum)	-0.005. (0.003)	0 (0.003)	0.001 (0.004)	-0.011*** (0.003)	0.006* (0.003)	0 (0.003)	0.001 (0.002)	0.001 (0.002)	-0.001 (0.003)
Index IPR multilateral coherence pl (dummy sum)	-0.001 (0)	0.001. (0)	0.001. (0.001)	0.001. (0)	0 (0)	0 (0)	0.001** (0)	0 (0)	-0.001* (0)
Control Variables									
Democratisation (Polity 2) (mean)	-0.003 (0.002)	-0.003. (0.002)	0.003 (0.002)	-0.001 (0.002)	-0.002 (0.002)	-0.002 (0.002)	-0.001 (0.001)	-0.002 (0.001)	-0.001 (0.002)
Classic IP leaders	-0.067* (0.034)	-0.066* (0.033)	-0.078. (0.046)	0.191*** (0.035)	0.117*** (0.032)	0.09* (0.036)	-0.004 (0.018)	-0.032 (0.027)	-0.072* (0.031)
Countries with a high increase of patent protection	-0.041. (0.023)	-0.013 (0.022)	-0.024 (0.03)	0.092*** (0.023)	-0.011 (0.021)	0.046. (0.023)	0.003 (0.011)	0.001 (0.018)	0.023 (0.021)
New IP producers and developers	-0.037 (0.027)	-0.086*** (0.026)	-0.043 (0.034)	-0.028 (0.026)	-0.039 (0.024)	-0.084** (0.027)	-0.013 (0.013)	0.017 (0.021)	0.046. (0.025)
ln GDP (mean)	0.024** (0.008)	0.022** (0.008)	-0.001 (0.011)	-0.037*** (0.008)	0.006 (0.007)	-0.009 (0.008)	0.003 (0.004)	-0.003 (0.006)	-0.012. (0.008)
ln GDPpc (mean)	-0.04*** (0.011)	-0.026* (0.011)	-0.027. (0.014)	0.042*** (0.011)	0.011 (0.01)	0.003 (0.011)	0.001 (0.005)	-0.001 (0.008)	-0.015 (0.01)
ln Geographic distance (mean)	-0.006 (0.01)	-0.002 (0.01)	0.057*** (0.013)	-0.017. (0.01)	0 (0.009)	-0.001 (0.01)	0 (0.005)	0.011 (0.008)	0.01 (0.009)
Intercept	-0.229 (0.162)	-0.322* (0.156)	-0.232 (0.212)	0.705*** (0.158)	-0.203 (0.148)	0.19 (0.168)	-0.074 (0.08)	-0.004 (0.127)	0.32* (0.151)
Model	m8apdg2_ols	m8bpdg2_ols	m8cpdg3_ols	m8dpdg4_ols	m8epdg3_ols	m8fpdg3_ols	m8gpdg4_ols	m8hpdg3_ols	m8ipdg1_ols
Observations	529	529	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 7: Path Dependency (general) II

Dependent Variables	**ipr_t_epcss**	**ipr_t_do-main_names**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure		
PTA members on Special 301 Reports (sum)	-0.004 (0.004)	-0.005 (0.003)
Veto Players		
Veto players (sum)	0.007 (0.005)	0.007. (0.004)
Endogeneity		
PTA depth	-0.005 (0.007)	-0.017** (0.005)
Substantial tariff cuts (dummy)	–	–
Index IPR enforcement (sum)	0.05*** (0.005)	0.034*** (0.004)
Index IPR specific enforcement (sum)	–	–
Regime Preference		
Index IPR multilateral coherence (sum)	-0.001** (0)	-0.001 (0)
Path Dependency		
Index IPR general pd (sum)	-0.002 (0.002)	-0.003** (0.001)
Index based on binary IPR scope men-tioned pl – copyrights	0.051* (0.022)	0.02 (0.018)

Dependent Variables	**ipr_t_epcss**	**ipr_t_do-main_names**
Index based on binary IPR scope mentioned pl – trademarks	0.002 (0.032)	0.037 (0.026)
Index based on binary IPR scope mentioned pl – geographical indications	-0.046* (0.022)	-0.001 (0.018)
Index based on binary IPR scope mentioned pl – industrial designs	0.045 (0.04)	-0.023 (0.032)
Index based on binary IPR scope mentioned pl – patents	-0.044 (0.045)	-0.007 (0.036)
Index based on binary IPR scope mentioned pl – undisclosed information	0.019 (0.029)	0.005 (0.023)
Index based on binary IPR scope mentioned pl – layout-designs of integrated circuits	-0.017 (0.018)	-0.015 (0.015)
Index based on binary IPR scope mentioned pl – new plant varieties	0.001 (0.005)	-0.003 (0.004)
Index based on binary IPR scope mentioned pl – traditional knowledge & genetic resources	-0.007* (0.004)	-0.005 (0.003)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	0 (0.007)	-0.008 (0.005)
Index based on binary IPR scope mentioned pl – domain names	0.052*** (0.015)	0.071*** (0.012)
Index IPR general enforcement pd (sum)	0.002 (0.003)	0.005* (0.002)
Index IPR multilateral coherence pl (dummy sum)	-0.001 (0)	-0.001. (0)

Dependent Variables	**ipr_t_epcss**	**ipr_t_do-main_names**
Control Variables		
Democratisation (Polity 2) (mean)	-0.001 (0.002)	-0.001 (0.001)
Classic IP leaders	0.034 (0.031)	0.088*** (0.025)
Countries with a high increase of patent protection	0.012 (0.02)	-0.038* (0.017)
New IP producers and developers	-0.048* (0.024)	0 (0.019)
ln GDP (mean)	0.018* (0.007)	0.016** (0.006)
ln GDPpc (mean)	-0.026** (0.01)	-0.025** (0.008)
ln Geographic distance (mean)	0.002 (0.009)	0.005 (0.007)
Intercept	-0.265. (0.146)	-0.22. (0.119)
Model	m8jpdg1_ols	m8kpdg1_ols
Observations	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 8: Path Dependency (specific) I

Dependent Variables	**ipr_t_copyrights_related_rights**			**ipr_t_trade marks**	**ipr_t_geo_indications**			**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure									
PTA members on Special 301 Reports (sum)	0.009. (0.005)	0.332 (2562)	0.144 (0.193)	0.014** (0.005)	0.004 (0.006)	-0.391 (2950)	0.082 (0.106)	0.001 (0.005)	0.003 (0.004)
Veto Players									
Veto players (sum)	0.006 (0.005)	-1.087 (2582)	0.19 (0.222)	0.002 (0.005)	-0.005 (0.006)	-3.518 (5132)	-0.236 (0.23)	-0.008. (0.005)	-0.004 (0.004)
Endogeneity									
PTA depth	–	0.47 (4079)	0.722** (0.275)	–	0.039*** (0.009)	-0.631 (1637)	0.373*** (0.109)	–	-0.007 (0.006)
Substantial tariff cuts (dummy)	-0.034 (0.021)	–	–	-0.034. (0.02)	–	–	–	-0.008 (0.02)	–
Index IPR enforcement (sum)	0.085*** (0.005)	1.36 (1782)	0.804*** (0.195)	0.092*** (0.005)	–	–	–	–	–
Index IPR specific enforcement (sum)	–	–	–	–	0.077*** (0.011)	-0.074 (1390)	0.271** (0.099)	0.092*** (0.008)	0.149*** (0.008)
Regime Preference									
Index IPR multilateral coherence (sum)	0.001. (0)	0.055 (114.7)	0.021. (0.013)	0.001 (0)	0.002*** (0.001)	0.179 (61.14)	0.014* (0.006)	-0.001* (0)	-0.001* (0)
Path Dependency									
Indexes based on binary IPR scope tangible pl – copyrights	-0.015 (0.023)	-0.089 (3634)	-1.127. (0.659)	-0.048* (0.022)	0.027 (0.029)	0.174 (4876)	0.168 (0.316)	0.031 (0.022)	0.014 (0.021)

Dependent Variables	**ipr_t_copyrights_related_rights**			**ipr_t_trade marks**	**ipr_t_geo_indications**			**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**
Indexes based on binary IPR scope tangible pl – trademarks	-0.086** (0.029)	-1.328 (4500)	-3.044* (1.195)	-0.007 (0.027)	-0.001 (0.037)	0.732 (5957)	-0.044 (0.329)	-0.088** (0.028)	-0.05. (0.026)
Indexes based on binary IPR scope tangible pl – geographical indications	0.009 (0.011)	-0.335 (2920)	0.964* (0.405)	0.009 (0.01)	0.057*** (0.014)	1.398 (5249)	0.488** (0.162)	0.001 (0.011)	0.009 (0.01)
Indexes based on binary IPR scope tangible pl – industrial designs	0.001 (0.026)	0.375 (7813)	0.473 (0.611)	0.017 (0.025)	-0.011 (0.033)	1.082 (2332)	-0.039 (0.357)	-0.081** (0.025)	-0.021 (0.023)
Indexes based on binary IPR scope tangible pl – patents	0.024 (0.03)	0.787 (6879)	0.726 (0.77)	-0.01 (0.028)	-0.02 (0.038)	0.306 (6387)	-0.359 (0.495)	0.105*** (0.029)	0.031 (0.027)
Indexes based on binary IPR scope tangible pl – undisclosed information	-0.008. (0.005)	0.001 (585.2)	-0.109 (0.198)	0.007 (0.005)	0.007 (0.006)	-0.142 (544.6)	0.034 (0.124)	-0.007 (0.005)	-0.007. (0.004)
Indexes based on binary IPR scope tangible pl – layout-designs of integrated circuits	0.01 (0.01)	-0.246 (675.8)	2.125** (0.699)	0.001 (0.009)	0.029* (0.012)	0.492 (860.4)	0.643* (0.28)	-0.034*** (0.009)	0.023** (0.009)
Indexes based on binary IPR scope tangible pl – new plant varieties	0.047* (0.019)	0.345 (3335)	0.062 (0.605)	0.048** (0.018)	-0.016 (0.024)	-0.472 (3245)	-0.36 (0.291)	0.033. (0.019)	-0.019 (0.017)
Indexes based on binary IPR scope tangible pl – traditional knowledge & genetic re-sources	0.016 (0.01)	-0.483 (2114)	0.677 (0.498)	0.022* (0.01)	-0.024. (0.013)	-0.134 (1316)	-0.131 (0.148)	-0.008 (0.01)	-0.008 (0.009)
Indexes based on binary IPR scope tangible pl – encrypted program-carrying satellite signals	0.115*** (0.026)	0.629 (7467)	1.786. (0.944)	0.083*** (0.025)	-0.041 (0.033)	-0.912 (5067)	-0.203 (0.348)	0.039 (0.026)	0.003 (0.024)
Indexes based on binary IPR scope tangible pl – domain names	-0.052* (0.026)	-0.972 (8301)	-1.296 (1)	-0.02 (0.024)	0.066* (0.033)	1.143 (5790)	0.263 (0.379)	-0.115*** (0.025)	-0.043. (0.023)
Index IPR specific enforcement pd (sum)	0.004 (0.002)	0.194 (1556)	0.243* (0.112)	-0.002 (0.002)	-0.001 (0.003)	0.128 (754)	0.004 (0.063)	0.006* (0.002)	0.001 (0.002)
Index IPR multilateral coherence pd (sum)	-0.001 (0.001)	0.009 (2.179)	-0.041. (0.024)	-0.001 (0.001)	-0.001 (0.001)	-0.06 (12.83)	0.004 (0.014)	0.001 (0.001)	0.001* (0.001)

Dependent Variables	**ipr_t_copyrights_related_rights**			**ipr_t_trade marks**	**ipr_t_geo_indications**			**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**
Control Variables									
Democratisation (Polity 2) (mean)	-0.004* (0.002)	0.233 (1144)	-0.072 (0.099)	-0.004* (0.002)	0.003 (0.002)	-0.444 (483.9)	0.059 (0.044)	-0.002 (0.002)	-0.002 (0.002)
Classic IP leaders	-0.039 (0.034)	1.46 (5902)	-0.672 (1.049)	-0.007 (0.033)	-0.054 (0.045)	1.342 (4372)	0.368 (0.516)	0.168*** (0.035)	0.12*** (0.032)
Countries with a high increase of patent protection	-0.055* (0.023)	-0.001 (9888)	-2.428** (0.843)	-0.02 (0.022)	-0.023 (0.029)	-1.899 (9794)	-0.161 (0.357)	0.087*** (0.023)	-0.012 (0.021)
New IP producers and developers	-0.022 (0.027)	0.001 (5291)	-0.327 (0.93)	-0.066** (0.025)	-0.03 (0.034)	-1.349 (3519)	-0.36 (0.376)	-0.017 (0.026)	-0.015 (0.024)
ln GDP (mean)	0.023** (0.008)	-1.221 (2516)	0.644. (0.339)	0.014. (0.008)	-0.004 (0.01)	-1.727 (2902)	-0.128 (0.151)	-0.033*** (0.008)	0.003 (0.007)
ln GDPpc (mean)	-0.036*** (0.011)	0.298 (4847)	-1.552** (0.573)	-0.018. (0.01)	-0.019 (0.014)	2.662 (2692)	-0.457* (0.213)	0.043*** (0.01)	0.01 (0.01)
ln Geographic distance (mean)	-0.004 (0.01)	-0.459 (3980)	-0.723. (0.38)	-0.007 (0.01)	0.051*** (0.013)	0.836 (2424)	0.91*** (0.225)	-0.012 (0.01)	-0.001 (0.009)
Intercept	-0.259 (0.158)	-4.385 (91040)	-5.273 (5.8)	-0.147 (0.151)	-0.17 (0.204)	-8.067 (87510)	-3.711 (2.824)	0.564*** (0.153)	-0.122 (0.146)
Model	m8apds2_ols	m8apds1_hp	m8apds1_hp	m8bpds2_ols	m8cpds3_ols	m8cpds3_hp	m8cpds3_hp	m8dpds4_ols	m8epds3_ols
		Count Data (Stage 2)	Zero Data (Stage 1)			Count Data (Stage 2)	Zero Data (Stage 1)		
Observations	529	529	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 9: Path Dependency (specific) II

Dependent Variables	**ipr_t_undisclosed_information**			**ipr_t_layout_design_integ_circuits**			**ipr_t_new_ plant_vari- eties**	**ipr_t_tkgr**	**ipr_t_epcss**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure									
PTA members on Special 301 Reports (sum)	0.008 (0.005)	0.602 (5100)	0.475* (0.187)	0.008** (0.002)	0.602 (5100)	0.475* (0.187)	0.014*** (0.004)	0.008. (0.004)	-0.006 (0.004)
Veto Players									
Veto players (sum)	-0.012* (0.005)	-0.679 (11570)	-0.617* (0.265)	0.001 (0.002)	-0.679 (11570)	-0.617* (0.265)	0 (0.004)	0.001 (0.004)	0.005 (0.004)
Endogeneity									
PTA depth	0.013. (0.007)	0.222 (2181)	0.211 (0.152)	0.003 (0.003)	0.222 (2181)	0.211 (0.152)	–	0.007 (0.006)	–
Substantial tariff cuts (dummy)	–	–	–	–	–	–	0.006 (0.016)	–	-0.016 (0.018)
Index IPR enforcement (sum)	–	–	–	–	–	–	–	0.008. (0.005)	0.05*** (0.004)
Index IPR specific enforcement (sum)	0.062*** (0.008)	0.776 (2767)	0.616*** (0.156)	0.021*** (0.004)	0.776 (2767)	0.616*** (0.156)	0.037*** (0.006)	–	–
Regime Preference									
Index IPR multilateral coherence (sum)	0 (0)	0.087 (237.4)	0.001 (0.012)	-0.001*** (0)	0.087 (237.4)	0.001 (0.012)	0 (0)	0.002*** (0)	-0.001** (0)
Path Dependency									
Indexes based on binary IPR scope tangible pl – copyrights	0.007 (0.023)	0.125 (18510)	-0.161 (0.405)	-0.027* (0.011)	0.125 (18510)	-0.161 (0.405)	0.005 (0.017)	0.033 (0.021)	-0.031 (0.02)

Dependent Variables	**ipr_t_undisclosed_information**			**ipr_t_layout_design_integ_circuits**			**ipr_t_new_ plant_vari- eties**	**ipr_t_tkgr**	**ipr_t_epcss**
Indexes based on binary IPR scope tangible pl – trademarks	-0.053. (0.029)	-1.024 (29000)	-0.779 (0.494)	0.006 (0.014)	-1.024 (29000)	-0.779 (0.494)	-0.058** (0.022)	-0.071** (0.026)	0.055* (0.025)
Indexes based on binary IPR scope tangible pl – geographical indications	0.037*** (0.011)	0.294 (10450)	0.483. (0.249)	-0.017** (0.006)	0.294 (10450)	0.483. (0.249)	0.003 (0.008)	0.01 (0.01)	-0.013 (0.009)
Indexes based on binary IPR scope tangible pl – industrial designs	-0.008 (0.026)	-0.066 (10740)	-0.466 (0.72)	-0.017 (0.013)	-0.066 (10740)	-0.466 (0.72)	-0.045* (0.02)	-0.094*** (0.023)	0.1*** (0.022)
Indexes based on binary IPR scope tangible pl – patents	-0.009 (0.031)	-0.113 (17490)	0.196 (0.756)	0.056*** (0.015)	-0.113 (17490)	0.196 (0.756)	0.042. (0.023)	0.064* (0.027)	-0.077** (0.026)
Indexes based on binary IPR scope tangible pl – undisclosed information	-0.004 (0.005)	0.356 (6843)	-0.198 (0.215)	-0.003 (0.002)	0.356 (6843)	-0.198 (0.215)	-0.008* (0.004)	-0.014** (0.004)	0.003 (0.004)
Indexes based on binary IPR scope tangible pl – layout-designs of integrated circuits	0.052*** (0.01)	-0.114 (6995)	0.373* (0.158)	-0.013** (0.005)	-0.114 (6995)	0.373* (0.158)	-0.016* (0.007)	-0.009 (0.009)	0.026** (0.008)
Indexes based on binary IPR scope tangible pl – new plant varieties	0.007 (0.019)	0.614 (13270)	0.683 (0.443)	-0.022* (0.01)	0.614 (13270)	0.683 (0.443)	0.035* (0.015)	0.071*** (0.017)	-0.046** (0.017)
Indexes based on binary IPR scope tangible pl – traditional knowledge & genetic re- sources	-0.001 (0.01)	0.023 (13860)	0.354 (0.275)	0.012* (0.005)	0.023 (13860)	0.354 (0.275)	-0.015. (0.008)	-0.006 (0.009)	0.011 (0.009)
Indexes based on binary IPR scope tangible pl – encrypted program-carrying satellite signals	0.031 (0.027)	0.954 (15200)	0.896. (0.473)	0.006 (0.013)	0.954 (15200)	0.896. (0.473)	0.006 (0.02)	0.056* (0.024)	0.031 (0.023)
Indexes based on binary IPR scope tangible pl – domain names	-0.057* (0.026)	-0.504 (19720)	-1.199. (0.613)	-0.047*** (0.013)	-0.504 (19720)	-1.199. (0.613)	-0.006 (0.02)	0.034 (0.023)	0.035 (0.022)
Index IPR specific enforcement pd (sum)	0.002 (0.002)	-0.214 (3165)	0.114 (0.08)	0.001 (0.001)	-0.214 (3165)	0.114 (0.08)	0.005** (0.002)	0 (0.002)	-0.007*** (0.002)
Index IPR multilateral coherence pd (sum)	-0.001 (0.001)	0.075 (57.18)	-0.031 (0.028)	0 (0)	0.075 (57.18)	-0.031 (0.028)	0 (0)	0.001 (0.001)	0 (0.001)

Dependent Variables	**ipr_t_undisclosed_information**			**ipr_t_layout_design_integ_circuits**			**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**	**ipr_t_epcss**
Control Variables									
Democratisation (Polity 2) (mean)	-0.001 (0.002)	-0.265 (1039)	-0.015 (0.055)	-0.001 (0.001)	-0.265 (1039)	-0.015 (0.055)	-0.001 (0.001)	-0.002 (0.002)	-0.002 (0.002)
Classic IP leaders	0.109** (0.036)	2.544 (19850)	1.821* (0.737)	0.006 (0.018)	2.544 (19850)	1.821* (0.737)	-0.014 (0.027)	-0.068* (0.031)	0.048 (0.03)
Countries with a high increase of patent protection	0.045. (0.024)	0.946 (16030)	0.91. (0.494)	-0.005 (0.012)	0.946 (16030)	0.91. (0.494)	0.011 (0.018)	0.028 (0.021)	-0.006 (0.02)
New IP producers and developers	-0.052. (0.027)	-1.033 (42240)	-1.095. (0.655)	-0.005 (0.013)	-1.033 (42240)	-1.095. (0.655)	0.038. (0.02)	0.074** (0.024)	-0.076** (0.023)
ln GDP (mean)	-0.008 (0.008)	-0.9 (9697)	-0.317 (0.197)	0.004 (0.004)	-0.9 (9697)	-0.317 (0.197)	-0.007 (0.006)	-0.017* (0.007)	0.014* (0.007)
ln GDPpc (mean)	0.003 (0.011)	0.203 (8714)	0.112 (0.293)	-0.004 (0.005)	0.203 (8714)	0.112 (0.293)	0 (0.008)	-0.004 (0.01)	-0.025** (0.009)
ln Geographic distance (mean)	-0.004 (0.01)	-0.201 (7027)	-0.152 (0.307)	0.002 (0.005)	-0.201 (7027)	-0.152 (0.307)	0.01 (0.008)	0.01 (0.009)	0.002 (0.009)
Intercept	0.213 (0.164)	-0.383 (268100)	4.239 (4.499)	-0.089 (0.08)	-0.383 (268100)	4.239 (4.499)	0.098 (0.12)	0.339* (0.145)	-0.176 (0.137)
Model	m8fpds3_ols	m8fpds3_hp	m8fpds3_hp	m8gpds3_ols	m8gpds3_hp	m8gpds3_hp	m8hpds4_ols	m8ipds1_ols	m8jpds2_ols
		Count Data (Stage 2)	Zero Data (Stage 1)		Count Data (Stage 2)	Zero Data (Stage 1)			
Observations	529	529	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 10: Path Dependency (specific) III

Dependent Variables	**ipr_t_domain_names**
Explanatory Variables	Estimates (Std. Error)
Political Pressure	
PTA members on Special 301 Reports (sum)	-0.003 (0.004)
Veto Players	
Veto players (sum)	0.004 (0.004)
Endogeneity	
PTA depth	-0.016** (0.005)
Substantial tariff cuts (dummy)	–
Index IPR enforcement (sum)	0.035*** (0.004)
Index IPR specific enforcement (sum)	–
Regime Preference	
Index IPR multilateral coherence (sum)	0 (0)
Path Dependency	
Indexes based on binary IPR scope tangible pl – copyrights	0.023 (0.016)
Indexes based on binary IPR scope tangible pl – trademarks	0.017 (0.021)

Dependent Variables	**ipr_t_domain_names**
Indexes based on binary IPR scope tangible pl – geographical indications	0.008 (0.008)
Indexes based on binary IPR scope tangible pl – industrial designs	0.073*** (0.019)
Indexes based on binary IPR scope tangible pl – patents	-0.087*** (0.021)
Indexes based on binary IPR scope tangible pl – undisclosed information	-0.002 (0.003)
Indexes based on binary IPR scope tangible pl – layout-designs of integrated circuits	0.021** (0.007)
Indexes based on binary IPR scope tangible pl – new plant varieties	-0.041** (0.014)
Indexes based on binary IPR scope tangible pl – traditional knowledge & genetic resources	-0.015* (0.007)
Indexes based on binary IPR scope tangible pl – encrypted program-carrying satellite signals	-0.026 (0.019)
Indexes based on binary IPR scope tangible pl – domain names	0.096*** (0.019)
Index IPR specific enforcement pd (sum)	-0.004** (0.002)
Index IPR multilateral coherence pd (sum)	0.001* (0)

Dependent Variables	**ipr_t_do-main_names**
Control Variables	
Democratisation (Polity 2) (mean)	-0.001 (0.001)
Classic IP leaders	0.08** (0.025)
Countries with a high increase of patent protection	-0.044** (0.017)
New IP producers and developers	-0.024 (0.019)
ln GDP (mean)	0.013* (0.006)
ln GDPpc (mean)	-0.026*** (0.008)
ln Geographic distance (mean)	0.004 (0.007)
Intercept	-0.137 (0.115)
Model	m8kpds1_ols
Observations	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 11: Path Dependency (TRIPS-plus) I

Dependent Variables	**ipr_t_copyrights_related_rights**			**ipr_t_trade marks**	**ipr_t_geo_indications**			**ipr_t_industrial_designs**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure								
PTA members on Special 301 Reports (sum)	0.006 (0.005)	0.053 (1074)	0.175 (0.18)	0.015** (0.005)	0.003 (0.006)	0.957 (748.7)	0.093 (0.119)	-0.003 (0.005)
Veto Players								
Veto players (sum)	0.011* (0.005)	0.196 (1742)	0.138 (0.161)	0.004 (0.005)	-0.007 (0.006)	-0.543 (1094)	-0.248 (0.226)	-0.005 (0.005)
Endogeneity								
PTA depth	–	-0.015 (1734)	0.584* (0.238)	–	0.043*** (0.009)	0.352 (610.6)	0.392*** (0.111)	–
Substantial tariff cuts (dummy)	-0.043* (0.021)	–	–	-0.042* (0.02)	–	–	–	-0.015 (0.02)
Index IPR enforcement (sum)	0.086*** (0.005)	1.271 (996.5)	0.834*** (0.204)	0.091*** (0.005)	–	–	–	–
Index IPR specific enforcement (sum)	–	–	–	–	0.079*** (0.01)	0.359 (276.3)	0.288** (0.098)	0.095*** (0.008)
Regime Preference								
Index IPR multilateral coherence (sum)	0.001** (0)	-0.014 (76.13)	0.019 (0.012)	0.001* (0)	0.002** (0.001)	0.05 (26.64)	0.01. (0.006)	-0.001* (0)
Path Dependency								
Indexes based on binary TRIPS-plus categories pd – copyrights	-0.034* (0.013)	-0.254 (1856)	-0.489 (0.459)	-0.052*** (0.013)	-0.047** (0.017)	-0.102 (1367)	-0.107 (0.248)	0.009 (0.013)

Dependent Variables	**ipr_t_copyrights_related_rights**			**ipr_t_trade marks**	**ipr_t_geo_indications**			**ipr_t_in-dus-trial_de-signs**
Indexes based on binary TRIPS-plus categories pd – trademarks	-0.011 (0.016)	-0.633 (2984)	-0.721 (0.622)	0.059*** (0.015)	0.093*** (0.021)	-0.036 (1151)	0.293 (0.274)	-0.06*** (0.015)
Indexes based on binary TRIPS-plus categories pd – geographical indications	-0.014* (0.006)	-0.421 (1800)	-0.182 (0.182)	0.007 (0.006)	0.015. (0.008)	-0.69 (1290)	0.375 (0.255)	0.004 (0.006)
Indexes based on binary TRIPS-plus categories pd – industrial designs	0.006 (0.015)	0.614 (2743)	0.524 (0.456)	-0.021 (0.015)	-0.034. (0.02)	0.981 (778.8)	-0.064 (0.242)	-0.011 (0.014)
Indexes based on binary TRIPS-plus categories pd – patents	0.042*** (0.012)	0.347 (3208)	0.821 (0.588)	0.009 (0.011)	0.002 (0.015)	-0.217 (990)	-0.05 (0.176)	0.051*** (0.011)
Indexes based on binary TRIPS-plus categories pd – undisclosed information	0.009 (0.007)	0.299 (1398)	0.143 (0.238)	0.016* (0.007)	0.02* (0.009)	0.441 (734.3)	0.194 (0.198)	0.011 (0.007)
Indexes based on binary TRIPS-plus categories pd – layout-designs of integrated circuits	0.091** (0.03)	0.311 (2921)	5.044** (1.928)	0.097*** (0.029)	0.111** (0.039)	0.826 (1317)	0.612 (0.429)	-0.103*** (0.029)
Indexes based on binary TRIPS-plus categories pd – new plant varieties	-0.004 (0.016)	0.027 (2233)	-0.561 (0.507)	-0.006 (0.016)	-0.024 (0.021)	-0.202 (1398)	-0.17 (0.277)	0.053*** (0.016)
Indexes based on binary TRIPS-plus categories pd – traditional knowledge & genetic resources	0.005 (0.006)	0.206 (1248)	0.152 (0.141)	0.002 (0.006)	-0.011 (0.008)	0.436 (455.9)	-0.008 (0.093)	-0.01 (0.006)
Indexes based on binary TRIPS-plus categories pd – encrypted program-carrying satellite signals	0.01 (0.024)	0.047 (3009)	-3.004* (1.522)	-0.037 (0.023)	-0.049 (0.031)	-0.451 (1521)	-0.164 (0.377)	0.008 (0.023)
Indexes based on binary TRIPS-plus categories pd – domain names	-0.007 (0.023)	-0.703 (2527)	2.45. (1.38)	0.026 (0.023)	0.06. (0.031)	-0.289 (1295)	0.083 (0.353)	-0.102*** (0.023)
Indexes based on binary TRIPS-plus categories pd – enforcement	0.001 (0.006)	-0.131 (1962)	0.147 (0.096)	-0.014* (0.006)	-0.007 (0.008)	-0.445 (1551)	0.008 (0.159)	0.005 (0.006)

Dependent Variables	**ipr_t_copyrights_related_rights**			**ipr_t_trade marks**	**ipr_t_geo_indications**			**ipr_t_in-dus-trial_de-signs**
Indexes based on binary TRIPS-plus categories pd – exhaustion	-0.004 (0.009)	-0.421 (512.7)	0.321 (0.513)	0 (0.009)	0.007 (0.012)	-0.079 (287.9)	-0.153 (0.2)	-0.048*** (0.009)
Control Variables								
Democratisation (Polity 2) (mean)	-0.003 (0.002)	0.116 (326)	-0.089 (0.086)	-0.004* (0.002)	0.002 (0.002)	0.265 (226.5)	0.026 (0.043)	0.001 (0.002)
Classic IP leaders	-0.09** (0.034)	0.716 (4519)	-1.517. (0.861)	-0.042 (0.033)	-0.057 (0.046)	0.873 (1894)	0.492 (0.476)	0.154*** (0.034)
Countries with a high increase of patent protection	-0.053* (0.023)	0.012 (2454)	-1.581* (0.76)	-0.024 (0.022)	-0.038 (0.03)	-0.246 (1737)	-0.225 (0.354)	0.1*** (0.022)
New IP producers and developers	-0.05. (0.026)	-0.816 (2920)	-0.36 (0.678)	-0.073** (0.025)	-0.034 (0.034)	-0.906 (1418)	-0.473 (0.364)	-0.025 (0.025)
ln GDP (mean)	0.021** (0.008)	-0.579 (2576)	0.19 (0.253)	0.014. (0.008)	-0.004 (0.01)	-0.738 (708.9)	-0.176 (0.146)	-0.034*** (0.008)
ln GDPpc (mean)	-0.031** (0.01)	-0.089 (3677)	-0.847* (0.419)	-0.017. (0.01)	-0.019 (0.014)	0.738 (1054)	-0.404. (0.231)	0.04*** (0.01)
ln Geographic distance (mean)	-0.007 (0.01)	-0.982 (2103)	-0.442 (0.394)	-0.007 (0.01)	0.056*** (0.013)	-0.221 (667.5)	0.969*** (0.223)	-0.017. (0.01)
Intercept	-0.217 (0.156)	-1.979 (53560)	-0.533 (4.823)	-0.165 (0.151)	-0.193 (0.206)	-7.229 (17240)	-3.322 (2.679)	0.633*** (0.15)
Model	m8apdtp2_ols	m8apdtp1_hp	m8apdtp1_hp	m8bpdtp2_ols	m8cpdtp3_ols	m8cpdtp3_hp	m8cpdtp3_hp	m8dpdtp4_ols
		Count Data (Stage 2)	Zero Data (Stage 1)			Count Data (Stage 2)	Zero Data (Stage 1)	
Observations	529	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 12: Path Dependency (TRIPS-plus) II

Dependent Variables	ipr_t_patents			ipr_t_un-dis-closed_in-formation	ipr_t_lay-out_de-sign_in-teg_circuits	ipr_t_new_plant_vari-eties	ipr_t_tkgr	ipr_t_epcss	ipr_t_do-main_names
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure									
PTA members on Special 301 Reports (sum)	0.002 (0.004)	-0.034 (645)	0.006 (0.093)	0.005 (0.005)	0.007** (0.002)	0.007* (0.004)	0.003 (0.004)	0.001 (0.004)	0 (0.003)
Veto Players									
Veto players (sum)	-0.003 (0.004)	-0.111 (1208)	0.035 (0.108)	-0.009. (0.005)	0.002 (0.002)	0.004 (0.004)	0.003 (0.004)	0.003 (0.004)	0.002 (0.003)
Endogeneity									
PTA depth	-0.007 (0.006)	3.013 (1224)	-0.112 (0.158)	0.016* (0.007)	0.002 (0.003)	0.001 (0.005)	0.007 (0.006)	-0.005 (0.006)	-0.015** (0.005)
Substantial tariff cuts (dummy)	–	–	–	–	–	–	–	–	–
Index IPR enforcement (sum)	–	–	–	–	–	–	0.009* (0.005)	0.047*** (0.004)	0.033*** (0.004)
Index IPR specific enforcement (sum)	0.148*** (0.007)	2.573 (1646)	0.868*** (0.169)	0.063*** (0.008)	0.019*** (0.004)	0.04*** (0.006)	–	–	–
Regime Preference									
Index IPR multilateral coherence (sum)	-0.001. (0)	-0.079 (39.79)	-0.015 (0.012)	0 (0)	-0.001** (0)	0 (0)	0.002*** (0)	-0.001* (0)	0 (0)
Path Dependency									
Indexes based on binary TRIPS-plus categories pd – copyrights	-0.041*** (0.012)	-0.982 (1265)	-0.35 (0.262)	-0.002 (0.014)	-0.015* (0.007)	-0.011 (0.01)	-0.019 (0.012)	-0.017 (0.011)	-0.014 (0.009)

Dependent Variables	**ipr_t_patents**			**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_do-main_names**
Indexes based on binary TRIPS-plus categories pd – trademarks	-0.006 (0.015)	0.041 (1482)	-0.08 (0.302)	0.012 (0.017)	-0.027*** (0.008)	-0.037** (0.012)	-0.004 (0.014)	0.041** (0.013)	0.031** (0.011)
Indexes based on binary TRIPS-plus categories pd – geographical indications	0.004 (0.006)	-0.444 (905.2)	0.246 (0.213)	-0.007 (0.007)	0 (0.003)	0.005 (0.005)	0.006 (0.006)	-0.005 (0.005)	0.001 (0.005)
Indexes based on binary TRIPS-plus categories pd – industrial designs	-0.011 (0.014)	0.156 (1911)	-0.25 (0.359)	-0.032* (0.016)	0.013. (0.008)	-0.012 (0.011)	-0.073*** (0.013)	0.049*** (0.012)	0.027* (0.011)
Indexes based on binary TRIPS-plus categories pd – patents	0.039*** (0.011)	0.744 (1454)	0.396 (0.257)	0.012 (0.012)	-0.007 (0.006)	0.04*** (0.009)	0.05*** (0.011)	0 (0.01)	-0.009 (0.008)
Indexes based on binary TRIPS-plus categories pd – undisclosed information	0.016* (0.007)	-0.104 (570.4)	0.134 (0.125)	0.015* (0.008)	0.008* (0.004)	0.012* (0.005)	-0.011. (0.006)	-0.004 (0.006)	-0.004 (0.005)
Indexes based on binary TRIPS-plus categories pd – layout-designs of integrated circuits	0.022 (0.028)	1.378 (1110)	0.95 (1.052)	0.065* (0.032)	-0.021 (0.015)	-0.106*** (0.023)	-0.071** (0.027)	0.189*** (0.025)	0.113*** (0.021)
Indexes based on binary TRIPS-plus categories pd – new plant varieties	0.004 (0.015)	-0.018 (840.3)	0.091 (0.373)	0.018 (0.017)	0.024** (0.008)	0.049*** (0.012)	0.059*** (0.015)	-0.087*** (0.014)	-0.061*** (0.012)
Indexes based on binary TRIPS-plus categories pd – traditional knowledge & genetic resources	-0.011. (0.006)	0.691 (865.4)	-0.096 (0.098)	-0.006 (0.007)	0.002 (0.003)	-0.018*** (0.005)	0.004 (0.006)	-0.004 (0.005)	-0.002 (0.004)
Indexes based on binary TRIPS-plus categories pd – encrypted program-carrying satellite signals	-0.009 (0.022)	0.749 (1260)	-0.944 (1.05)	-0.044. (0.025)	0.017 (0.012)	-0.005 (0.018)	0.007 (0.021)	-0.007 (0.02)	-0.001 (0.017)
Indexes based on binary TRIPS-plus categories pd – domain names	-0.03 (0.022)	0.053 (1396)	0.609 (0.996)	-0.059* (0.025)	-0.013 (0.012)	-0.022 (0.018)	0.032 (0.021)	0.059** (0.02)	0.09*** (0.017)
Indexes based on binary TRIPS-plus categories pd – enforcement	-0.002 (0.005)	-0.9 (1152)	-0.219 (0.188)	0.009 (0.006)	-0.007* (0.003)	-0.009* (0.004)	-0.004 (0.005)	-0.001 (0.005)	-0.002 (0.004)

Dependent Variables		**ipr_t_patents**		**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_domain_names**
Indexes based on binary TRIPS-plus categories pd – exhaustion	0.01 (0.009)	0.739 (915.2)	0.151 (0.254)	-0.014 (0.01)	0.012* (0.005)	-0.029*** (0.007)	-0.014 (0.008)	0.01 (0.008)	0.022** (0.007)
Control Variables									
Democratisation (Polity 2) (mean)	-0.001 (0.002)	-0.329 (212.3)	-0.024 (0.052)	0 (0.002)	0 (0.001)	0 (0.001)	0.001 (0.002)	-0.003* (0.002)	-0.003* (0.001)
Classic IP leaders	0.109*** (0.033)	0.726 (2578)	0.339 (0.561)	0.089* (0.037)	0.005 (0.018)	-0.032 (0.027)	-0.084** (0.031)	0.026 (0.028)	0.083*** (0.024)
Countries with a high increase of patent protection	-0.009 (0.021)	-0.016 (1941)	0.103 (0.451)	0.049* (0.024)	0.006 (0.012)	0.018 (0.017)	0.038. (0.02)	-0.024 (0.019)	-0.061*** (0.016)
New IP producers and developers	-0.029 (0.024)	-0.207 (1589)	0.011 (0.523)	-0.056* (0.027)	-0.013 (0.013)	0.036. (0.02)	0.064** (0.023)	-0.089*** (0.022)	-0.025 (0.018)
ln GDP (mean)	0.001 (0.007)	-0.283 (1332)	0.164 (0.188)	-0.009 (0.008)	0.001 (0.004)	-0.006 (0.006)	-0.015* (0.007)	0.014* (0.007)	0.012* (0.006)
ln GDPpc (mean)	0.012 (0.01)	-1.732 (1877)	0.253 (0.263)	0.005 (0.011)	-0.003 (0.005)	-0.005 (0.008)	-0.007 (0.009)	-0.018* (0.009)	-0.021** (0.007)
ln Geographic distance (mean)	-0.006 (0.009)	-0.048 (618.8)	0.009 (0.225)	-0.004 (0.01)	-0.001 (0.005)	0.007 (0.007)	0.006 (0.009)	0.006 (0.008)	0.007 (0.007)
Intercept	-0.054 (0.145)	-10.88 (26490)	-9.112. (5.054)	0.195 (0.166)	0.002 (0.081)	0.108 (0.119)	0.356* (0.141)	-0.226. (0.131)	-0.156 (0.111)
Model	m8epdtp3_ols	m8epdtp3_hp	m8epdtp3_hp	m8fpdtp3_ols	m8gpdtp3_ols	m8hpdtp3_ols	m8ipdtp1_ols	m8jpdtp1_ols	m8kpdtp1_ols
		Count Data (Stage 2)	Zero Data (Stage 1)						
Observations	529	529	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 13: Path Dependency (world, signature, specific) I

Dependent Variables	**ipr_t_copy-rights_re-lated_right s**	**ipr_t_trade marks**	**ipr_t_geo_i ndications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**	**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_ plant_vari-eties**	**ipr_t_tkgr**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure									
PTA members on Special 301 Reports (sum)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0*** (0)	0 (0)	0 (0)	0 (0)
Veto Players									
Veto players (sum)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Endogeneity									
PTA depth	–	–	–	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	–
Substantial tariff cuts (dummy)	0. (0)	0 (0)	0 (0)	–	–	–	–	–	0 (0)
Index IPR enforcement (sum)	0 (0)	0 (0)	0 (0)	0. (0)	0 (0)	0 (0)	0. (0)	0. (0)	0 (0)
Index IPR specific enforcement (sum)	–	–	–	–	–	–	–	–	–
Regime Preference									
Index IPR multilateral coherence (sum)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0*** (0)	0. (0)	0 (0)	0 (0)
Path Dependency									
Indexes based on binary IPR scope tangible pdw s – copyrights	1*** (0)	0*** (0)	0 (0)	0 (0)	0** (0)	0*** (0)	0. (0)	0*** (0)	0*** (0)

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**	**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**
Indexes based on binary IPR scope tangible pdw s – trademarks	0 (0)	1*** (0)	0*** (0)	0** (0)	0*** (0)	0 (0)	0 (0)	0 (0)	0. (0)
Indexes based on binary IPR scope tangible pdw s – geographical indications	0 (0)	0 (0)	1*** (0)	0 (0)	0 (0)	0 (0)	0** (0)	0 (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw s – industrial designs	0 (0)	0 (0)	0 (0)	1*** (0)	0*** (0)	0*** (0)	0* (0)	0*** (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw s – patents	0 (0)	0 (0)	0 (0)	0 (0)	1*** (0)	0 (0)	0 (0)	0 (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw s – undisclosed information	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1*** (0)	0. (0)	0 (0)	0** (0)
Indexes based on binary IPR scope tangible pdw s – layout-designs of integrated circuits	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1*** (0)	0* (0)	0** (0)
Indexes based on binary IPR scope tangible pdw s – new plant varieties	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1*** (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw s – traditional knowledge & genetic resources	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1*** (0)
Indexes based on binary IPR scope tangible pdw s – encrypted program-carrying satellite signals	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Indexes based on binary IPR scope tangible pdw s – domain names	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Index IPR specific enforcement pdw s (sum)	0 (0)	0 (0)	0 (0)	0. (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**
Index IPR multilateral coherence pdw s (sum)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0*** (0)	0 (0)	0 (0)	0 (0)
Control Variables									
Democratisation (Polity 2) (mean)	0 (0)	0* (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Classic IP leaders	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0* (0)	0 (0)	0 (0)	0 (0)
Countries with a high increase of patent protection	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
New IP producers and developers	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
ln GDP (mean)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
ln GDPpc (mean)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
ln Geographic distance (mean)	0* (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Intercept	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0* (0)	0* (0)	0 (0)
Model	m8apdwss2_ols	m8bpdwss2_ols	m8cpdwss2_ols	m8dpdwss1_ols	m8epdwss1_ols	m8fpdwss1_ols	m8gpdwss1_ols	m8hpdwss1_ols	m8ipdwss2_ols
Observations	529	529	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 14: Path Dependency (world, signature, specific) II

Dependent Variables	**ipr_t_epcss**	**ipr_t_do-main_names**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure		
PTA members on Special 301 Reports (sum)	0 (0)	0 (0)
Veto Players		
Veto players (sum)	0 (0)	0 (0)
Endogeneity		
PTA depth	0 (0)	0 (0)
Substantial tariff cuts (dummy)	–	–
Index IPR enforcement (sum)	0. (0)	0 (0)
Index IPR specific enforcement (sum)	–	–
Regime Preference		
Index IPR multilateral coherence (sum)	0*** (0)	0 (0)
Path Dependency		
Indexes based on binary IPR scope tangible pdw s – copyrights	0*** (0)	0* (0)
Indexes based on binary IPR scope tangible pdw s – trademarks	0 (0)	0 (0)

Dependent Variables	**ipr_t_epcss**	**ipr_t_do-main_names**
Indexes based on binary IPR scope tangible pdw s – geographical indications	0** (0)	0 (0)
Indexes based on binary IPR scope tangible pdw s – industrial designs	0*** (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw s – patents	0*** (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw s – undisclosed information	0* (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw s – layout-designs of integrated circuits	0 (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw s – new plant varieties	0*** (0)	0. (0)
Indexes based on binary IPR scope tangible pdw s – traditional knowledge & genetic resources	0*** (0)	0 (0)
Indexes based on binary IPR scope tangible pdw s – encrypted program-carrying satellite signals	1*** (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw s – domain names	0. (0)	1*** (0)
Index IPR specific enforcement pdw s (sum)	0 (0)	0 (0)
Index IPR multilateral coherence pdw s (sum)	0*** (0)	0 (0)
Control Variables		

Dependent Variables	**ipr_t_epcss**	**ipr_t_do-main_names**
Democratisation (Polity 2) (mean)	0 (0)	0 (0)
Classic IP leaders	0 (0)	0 (0)
Countries with a high increase of patent protection	0 (0)	0 (0)
New IP producers and developers	0 (0)	0 (0)
ln GDP (mean)	0 (0)	0 (0)
ln GDPpc (mean)	0 (0)	0 (0)
ln Geographic distance (mean)	0 (0)	0 (0)
Intercept	0 (0)	0 (0)
Model	m8jpdwss1_ols	m8kpdwss1_ols
Observations	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 15: Path Dependency (world, signature, TRIPS-plus) I

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**		**ipr_t_geo_indications**		**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure									
PTA members on Special 301 Reports (sum)	0 (0.002)	0.002 (0.003)	0.002 (0.003)	0.055 (528.1)	0.1 (0.083)	0 (0.002)	-0.001 (0.003)	0.001 (0.003)	0.006*** (0.001)
Veto Players									
Veto players (sum)	0.001 (0.003)	0 (0.003)	0.003 (0.003)	-0.071 (406.9)	-0.013 (0.068)	-0.005* (0.002)	-0.005. (0.003)	0.001 (0.003)	-0.007*** (0.001)
Endogeneity									
PTA depth	0.008 (0.005)	–	0.02** (0.006)	-0.172 (888.4)	0.602** (0.225)	–	-0.008 (0.005)	0.004 (0.007)	–
Substantial tariff cuts (dummy)	–	-0.024 (0.016)	–	–	–	-0.008 (0.012)	–	–	0.004 (0.007)
Index IPR enforcement (sum)	0.013* (0.005)	0.042*** (0.006)	-0.011 (0.006)	0.019 (388.7)	-0.011 (0.141)	–	–	–	–
Index IPR specific enforcement (sum)	–	–	–	–	–	0.059*** (0.008)	0.075*** (0.01)	0.059*** (0.013)	-0.006 (0.004)
Regime Preference									
Index IPR multilateral coherence (sum)	-0.001 (0)	0 (0)	0 (0)	-0.085 (153.1)	-0.004 (0.012)	0 (0)	0 (0)	0 (0)	-0.001*** (0)
Path Dependency									
Indexes based on binary TRIPS-plus categories pdw s – copyrights	0.005 (0.024)	0.014 (0.027)	0.006 (0.03)	0.067 (25810)	-2.418 (8.383)	0.009 (0.02)	-0.012 (0.027)	0.005 (0.033)	0.001 (0.011)

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**			**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**
Indexes based on binary TRIPS-plus categories pdw s – geographical indications	-0.004 (0.055)	0.244*** (0.06)	-0.011 (0.068)	0.052 (10110)	1.313 (1.386)	-0.008 (0.045)	-0.152* (0.06)	-0.267*** (0.074)	0.343*** (0.025)
Indexes based on binary TRIPS-plus categories pdw s – industrial designs	0.319*** (0.041)	0.126** (0.044)	0.325*** (0.051)	2.424 (8085)	-0.031 (1.124)	-0.038 (0.033)	0.178*** (0.045)	-0.002 (0.054)	0.033. (0.019)
Indexes based on binary TRIPS-plus categories pdw s – patents	0.405*** (0.043)	-0.008 (0.047)	-0.057 (0.053)	0.016 (7343)	0.369 (1.357)	-0.058 (0.036)	-0.124** (0.048)	-0.006 (0.058)	0.051* (0.02)
Indexes based on binary TRIPS-plus categories pdw s – undisclosed information	0.264*** (0.045)	0.527*** (0.049)	0.017 (0.056)	-0.1 (7688)	0.382 (1.4)	-0.106** (0.038)	0.106* (0.05)	-0.035 (0.061)	0.08*** (0.021)
Indexes based on binary TRIPS-plus categories pdw s – layout-designs of integrated circuits	-0.159*** (0.031)	0.035 (0.034)	0.429*** (0.039)	0.344 (5278)	3.756*** (1.089)	0.043 (0.026)	-0.174*** (0.034)	0.078. (0.042)	-0.052*** (0.014)
Indexes based on binary TRIPS-plus categories pdw s – new plant varieties	-0.084* (0.035)	-0.248*** (0.038)	-0.472*** (0.043)	-0.573 (5757)	-1.72 (1.268)	0.772*** (0.03)	0.328*** (0.041)	0.007 (0.05)	0.046** (0.017)
Indexes based on binary TRIPS-plus categories pdw s – traditional knowledge & genetic resources	-0.025 (0.044)	-0.116* (0.048)	0.216*** (0.054)	0.649 (8445)	0.367 (0.99)	-0.037 (0.037)	0.349*** (0.049)	-0.318*** (0.059)	-0.026 (0.02)
Indexes based on binary TRIPS-plus categories pdw s – encrypted program-carrying satellite signals	0.036 (0.042)	0.042 (0.046)	0.395*** (0.052)	1.002 (7660)	5.021** (1.779)	0.032 (0.035)	0.043 (0.047)	0.417*** (0.057)	-0.074*** (0.02)
Indexes based on binary TRIPS-plus categories pdw s – domain names	0.531*** (0.104)	0.315** (0.114)	-0.021 (0.129)	-0.028 (13060)	-2.387 (21.878)	0.061 (0.087)	-0.248* (0.116)	0.784*** (0.142)	0.937*** (0.049)
Indexes based on binary TRIPS-plus categories pdw s – enforcement	-0.026 (0.035)	0.054 (0.038)	0.063 (0.043)	0.478 (5737)	0.679 (1.011)	0 (0.029)	-0.027 (0.039)	0.068 (0.047)	0.022 (0.016)
Indexes based on binary TRIPS-plus categories pdw s – exhaustion	0.207*** (0.036)	0.077* (0.039)	0.208*** (0.045)	-0.998 (7982)	2.213 (1.632)	0.089** (0.03)	-0.011 (0.04)	-0.038 (0.049)	-0.004 (0.017)

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**			**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**
Control Variables									
Democratisation (Polity 2) (mean)	0.001 (0.001)	-0.002 (0.001)	0.001 (0.002)	0.629 (1102)	-0.039 (0.07)	0 (0.001)	-0.001 (0.001)	-0.001 (0.002)	0.001 (0.001)
Classic IP leaders	0.015 (0.026)	0.028 (0.028)	-0.074* (0.032)	0.626 (5897)	0.597 (0.836)	0.102*** (0.022)	0.092** (0.029)	0.019 (0.036)	0.027* (0.012)
Countries with a high increase of patent protection	-0.006 (0.017)	-0.011 (0.018)	-0.04. (0.021)	-0.459 (5272)	-0.504 (0.663)	0.012 (0.014)	-0.006 (0.018)	0.018 (0.022)	0.006 (0.008)
New IP producers and developers	-0.008 (0.018)	-0.041* (0.02)	0.013 (0.022)	-0.346 (2875)	-0.161 (0.523)	-0.015 (0.015)	-0.024 (0.02)	-0.046. (0.024)	-0.011 (0.008)
ln GDP (mean)	0.003 (0.006)	0.01 (0.006)	0.006 (0.007)	-0.494 (2993)	-0.072 (0.271)	-0.003 (0.005)	0.002 (0.006)	-0.002 (0.008)	-0.005* (0.003)
ln GDPpc (mean)	-0.017* (0.008)	-0.01 (0.008)	-0.016 (0.01)	0.191 (1956)	-0.504 (0.41)	0.002 (0.006)	0.009 (0.009)	0.002 (0.011)	0.003 (0.004)
ln Geographic distance (mean)	-0.005 (0.007)	-0.006 (0.008)	0.033*** (0.009)	-0.157 (2855)	1.554** (0.474)	-0.005 (0.006)	-0.001 (0.008)	-0.007 (0.009)	0.001 (0.003)
Intercept	0.076 (0.114)	-0.127 (0.122)	-0.29* (0.142)	-9.087 (47830)	-10.753* (5.3)	0.107 (0.093)	-0.1 (0.126)	0.08 (0.154)	0.106* (0.052)
Model	m8apdwstp1_ols	m8bpdwstp2_ols	m8cpdwstp1_ols	m8cpdwstp1_hp	m8cpdwstp1_hp	m8dpdwstp4_ols	m8epdwstp3_ols	m8fpdwstp3_ols	m8gpdwstp4_ols
				Count Data (Stage 2)	Zero Data (Stage 1)				
Observations	529	529	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 16: Path Dependency (world, signature, TRIPS-plus) II

Dependent Variables	**ipr_t_new_ plant_vari- eties**	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_do- main_name s**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure				
PTA members on Special 301 Reports (sum)	0.006** (0.002)	0.001 (0.002)	0.003 (0.002)	0.001 (0.002)
Veto Players				
Veto players (sum)	-0.005* (0.002)	-0.004. (0.002)	-0.006* (0.002)	-0.005** (0.002)
Endogeneity				
PTA depth	0.008. (0.005)	–	-0.001 (0.005)	-0.007. (0.004)
Substantial tariff cuts (dummy)	–	-0.004 (0.013)	–	–
Index IPR enforcement (sum)	–	–	0.015** (0.005)	0.02*** (0.004)
Index IPR specific enforcement (sum)	0.018* (0.009)	-0.023** (0.008)	–	–
Regime Preference				
Index IPR multilateral coherence (sum)	-0.001*** (0)	0.001** (0)	0 (0)	0 (0)
Path Dependency				
Indexes based on binary TRIPS-plus cate- gories pdw s – copyrights	0.041. (0.022)	-0.023 (0.02)	0.034 (0.023)	0.018 (0.019)

Dependent Variables	**ipr_t_new_ plant_vari- eties**	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_do- main_name s**
Indexes based on binary TRIPS-plus categories pdw s – geographical indications	0.121* (0.05)	-0.055 (0.046)	-0.179*** (0.051)	-0.146*** (0.043)
Indexes based on binary TRIPS-plus categories pdw s – industrial designs	0.005 (0.037)	0.113*** (0.034)	0.048 (0.038)	0.087** (0.032)
Indexes based on binary TRIPS-plus categories pdw s – patents	0.111** (0.04)	0.068. (0.036)	-0.15*** (0.04)	-0.106** (0.034)
Indexes based on binary TRIPS-plus categories pdw s – undisclosed information	0.078. (0.042)	0.108** (0.038)	0.342*** (0.042)	0.093** (0.036)
Indexes based on binary TRIPS-plus categories pdw s – layout-designs of integrated circuits	-0.107*** (0.029)	-0.008 (0.026)	-0.001 (0.029)	-0.145*** (0.025)
Indexes based on binary TRIPS-plus categories pdw s – new plant varieties	0.152*** (0.034)	-0.046 (0.031)	-0.234*** (0.033)	-0.25*** (0.028)
Indexes based on binary TRIPS-plus categories pdw s – traditional knowledge & genetic resources	-0.147*** (0.04)	-0.134*** (0.037)	0.226*** (0.041)	0.349*** (0.035)
Indexes based on binary TRIPS-plus categories pdw s – encrypted program-carrying satellite signals	-0.302*** (0.039)	-0.018 (0.035)	0.162*** (0.04)	0.086* (0.034)
Indexes based on binary TRIPS-plus categories pdw s – domain names	-0.168. (0.096)	0.05 (0.088)	0.417*** (0.098)	-0.399*** (0.083)
Indexes based on binary TRIPS-plus categories pdw s – enforcement	0.209*** (0.032)	-0.02 (0.029)	0.013 (0.033)	-0.007 (0.028)
Indexes based on binary TRIPS-plus categories pdw s – exhaustion	0.192*** (0.033)	0.752*** (0.03)	-0.222*** (0.034)	-0.026 (0.028)

Dependent Variables	**ipr_t_new_ plant_vari-eties**	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_do-main_name s**
Control Variables				
Democratisation (Polity 2) (mean)	0 (0.001)	0 (0.001)	0 (0.001)	0 (0.001)
Classic IP leaders	0.046. (0.024)	0.036 (0.022)	0.029 (0.024)	0.082*** (0.021)
Countries with a high increase of patent protection	0.008 (0.015)	0.008 (0.014)	0.023 (0.016)	0.004 (0.013)
New IP producers and developers	-0.002 (0.016)	0.064*** (0.015)	-0.011 (0.017)	0.01 (0.014)
ln GDP (mean)	-0.007 (0.005)	-0.004 (0.005)	-0.002 (0.005)	-0.006 (0.005)
ln GDPpc (mean)	-0.008 (0.007)	-0.005 (0.007)	-0.006 (0.007)	-0.002 (0.006)
ln Geographic distance (mean)	0.008 (0.006)	0.006 (0.006)	0.006 (0.007)	0.008 (0.006)
Intercept	0.162 (0.105)	0.081 (0.094)	0.04 (0.107)	0.1 (0.091)
Model	m8hpdwstp 3_ols	m8ipdwstp4 _ols	m8jpdwstp1 _ols	m8kpdwstp 1_ols
Observations	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 17: Path Dependency (world, force, specific) I

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**	**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure									
PTA members on Special 301 Reports (sum)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0*** (0)	0 (0)	0 (0)	0 (0)
Veto Players									
Veto players (sum)	0 (0)	0 (0)	0 (0)	0 (0)	0** (0)	0 (0)	0 (0)	0 (0)	0 (0)
Endogeneity									
PTA depth	–	–	–	0 (0)	0. (0)	0 (0)	0 (0)	0 (0)	–
Substantial tariff cuts (dummy)	0. (0)	0 (0)	0 (0)	–	–	–	–	–	0 (0)
Index IPR enforcement (sum)	0 (0)	0 (0)	0 (0)	0. (0)	0* (0)	0 (0)	0. (0)	0. (0)	0 (0)
Index IPR specific enforcement (sum)	–	–	–	–	–	–	–	–	–
Regime Preference									
Index IPR multilateral coherence (sum)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0*** (0)	0. (0)	0 (0)	0 (0)
Path Dependency									
Indexes based on binary IPR scope tangible pdw f – copyrights	1*** (0)	0*** (0)	0 (0)	0 (0)	0*** (0)	0** (0)	0* (0)	0*** (0)	0*** (0)

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**	**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**
Indexes based on binary IPR scope tangible pdw f – trademarks	0 (0)	1*** (0)	0 (0)	0** (0)	0*** (0)	0 (0)	0 (0)	0 (0)	0. (0)
Indexes based on binary IPR scope tangible pdw f – geographical indications	0 (0)	0 (0)	1*** (0)	0 (0)	0. (0)	0 (0)	0* (0)	0 (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw f – industrial designs	0 (0)	0 (0)	0 (0)	1*** (0)	0*** (0)	0*** (0)	0* (0)	0*** (0)	0** (0)
Indexes based on binary IPR scope tangible pdw f – patents	0 (0)	0 (0)	0 (0)	0 (0)	1*** (0)	0 (0)	0 (0)	0 (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw f – undisclosed information	0 (0)	0 (0)	0 (0)	0 (0)	0* (0)	1*** (0)	0 (0)	0 (0)	0** (0)
Indexes based on binary IPR scope tangible pdw f – layout-designs of integrated cir-cuits	0 (0)	0 (0)	0** (0)	0 (0)	0** (0)	0 (0)	1*** (0)	0* (0)	0** (0)
Indexes based on binary IPR scope tangible pdw f – new plant varieties	0 (0)	0 (0)	0 (0)	0 (0)	0** (0)	0 (0)	0 (0)	1*** (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw f – traditional knowledge & genetic resources	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1*** (0)
Indexes based on binary IPR scope tangible pdw f – encrypted program-carrying satel-lite signals	0 (0)	0 (0)	0 (0)	0 (0)	0*** (0)	0 (0)	0 (0)	0 (0)	0 (0)
Indexes based on binary IPR scope tangible pdw f – domain names	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Index IPR specific enforcement pdw f (sum)	0 (0)	0 (0)	0 (0)	0 (0)	0* (0)	0 (0)	0 (0)	0 (0)	0 (0)

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**	**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**
Index IPR multilateral coherence pdw f (sum)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0*** (0)	0 (0)	0 (0)	0 (0)
Control Variables									
Democratisation (Polity 2) (mean)	0 (0)	0* (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Classic IP leaders	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0. (0)	0 (0)	0 (0)	0 (0)
Countries with a high increase of patent protection	0 (0)	0 (0)	0 (0)	0 (0)	0* (0)	0 (0)	0 (0)	0 (0)	0 (0)
New IP producers and developers	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
ln GDP (mean)	0 (0)	0 (0)	0 (0)	0 (0)	0. (0)	0 (0)	0 (0)	0 (0)	0 (0)
ln GDPpc (mean)	0 (0)	0 (0)	0 (0)	0 (0)	0. (0)	0 (0)	0 (0)	0 (0)	0 (0)
ln Geographic distance (mean)	0. (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Intercept	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0* (0)	0* (0)	0 (0)
Model	m8apdwfs2_ols	m8bpdwfs2_ols	m8cpdwfs2_ols	m8dpdwfs1_ols	m8epdwfs1_ols	m8fpdwfs1_ols	m8gpdwfs1_ols	m8hpdwfs1_ols	m8ipdwfs2_ols
Observations	484	484	484	484	484	484	484	484	484

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 18: Path Dependency (world, force, specific) II

Dependent Variables	**ipr_t_epcss**	**ipr_t_do-main_names**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure		
PTA members on Special 301 Reports (sum)	0 (0)	0 (0)
Veto Players		
Veto players (sum)	0 (0)	0 (0)
Endogeneity		
PTA depth	0 (0)	0 (0)
Substantial tariff cuts (dummy)	–	–
Index IPR enforcement (sum)	0. (0)	0 (0)
Index IPR specific enforcement (sum)	–	–
Regime Preference		
Index IPR multilateral coherence (sum)	0*** (0)	0 (0)
Path Dependency		
Indexes based on binary IPR scope tangible pdw f – copyrights	0*** (0)	0** (0)
Indexes based on binary IPR scope tangible pdw f – trademarks	0 (0)	0 (0)

Dependent Variables	**ipr_t_epcss**	**ipr_t_do-main_names**
Indexes based on binary IPR scope tangible pdw f – geographical indications	0** (0)	0. (0)
Indexes based on binary IPR scope tangible pdw f – industrial designs	0*** (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw f – patents	0*** (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw f – undisclosed information	0* (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw f – layout-designs of integrated circuits	0 (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw f – new plant varieties	0*** (0)	0* (0)
Indexes based on binary IPR scope tangible pdw f – traditional knowledge & genetic resources	0*** (0)	0. (0)
Indexes based on binary IPR scope tangible pdw f – encrypted program-carrying satellite signals	1*** (0)	0*** (0)
Indexes based on binary IPR scope tangible pdw f – domain names	0. (0)	1*** (0)
Index IPR specific enforcement pdw f (sum)	0 (0)	0 (0)
Index IPR multilateral coherence pdw f (sum)	0*** (0)	0 (0)
Control Variables		

Dependent Variables	**ipr_t_epcss**	**ipr_t_do-main_names**
Democratisation (Polity 2) (mean)	0 (0)	0 (0)
Classic IP leaders	0 (0)	0 (0)
Countries with a high increase of patent protection	0 (0)	0 (0)
New IP producers and developers	0 (0)	0 (0)
ln GDP (mean)	0 (0)	0 (0)
ln GDPpc (mean)	0 (0)	0 (0)
ln Geographic distance (mean)	0 (0)	0 (0)
Intercept	0 (0)	0 (0)
Model	m8jpdwfs1_ols	m8kpdwfs1_ols
Observations	484	484

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 19: Path Dependency (world, force, TRIPS-plus) I

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure									
PTA members on Special 301 Reports (sum)	0.001 (0.003)	0.002 (0.003)	-0.001 (0.004)	0 (0.002)	0 (0.003)	0.002 (0.003)	0.007*** (0.001)	0.006** (0.002)	0 (0.002)
Veto Players									
Veto players (sum)	0 (0.003)	0.001 (0.003)	0.008* (0.004)	-0.004. (0.002)	-0.007* (0.003)	0 (0.004)	-0.008*** (0.001)	-0.006* (0.003)	0.001 (0.002)
Endogeneity									
PTA depth	0.007 (0.006)	0.011. (0.006)	0.025*** (0.007)	–	-0.011. (0.006)	0.004 (0.007)	–	0.008. (0.005)	–
Substantial tariff cuts (dummy)	–	–	–	-0.01 (0.013)	–	–	0.003 (0.008)	–	-0.005 (0.012)
Index IPR enforcement (sum)	0.019*** (0.006)	–	-0.025*** (0.007)	–	–	–	–	–	–
Index IPR specific enforcement (sum)	–	0.076*** (0.01)	–	0.058*** (0.008)	0.086*** (0.011)	0.052*** (0.013)	-0.004 (0.005)	0.023* (0.009)	-0.016* (0.007)
Regime Preference									
Index IPR multilateral coherence (sum)	-0.001* (0)	0 (0)	0.001* (0.001)	0 (0)	0 (0)	0 (0)	-0.001*** (0)	-0.001*** (0)	0.001*** (0)
Path Dependency									
Indexes based on binary TRIPS-plus categories pdw f – copyrights	0.011 (0.026)	0.026 (0.027)	-0.01 (0.034)	0.004 (0.02)	-0.005 (0.029)	0.003 (0.034)	0.004 (0.012)	0.044. (0.023)	-0.03 (0.019)

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**
Indexes based on binary TRIPS-plus categories pdw f – geographical indications	-0.026 (0.061)	0.224*** (0.063)	0.008 (0.08)	-0.006 (0.047)	-0.173** (0.067)	-0.204* (0.079)	0.356*** (0.028)	0.085 (0.055)	-0.134** (0.044)
Indexes based on binary TRIPS-plus categories pdw f – industrial designs	0.17*** (0.033)	0.133*** (0.034)	0.709*** (0.043)	0.002 (0.025)	0.031 (0.036)	0.078. (0.043)	-0.01 (0.015)	-0.082** (0.03)	0.091*** (0.023)
Indexes based on binary TRIPS-plus categories pdw f – patents	0.39*** (0.049)	-0.079 (0.052)	-0.076 (0.065)	-0.053 (0.038)	-0.19*** (0.055)	-0.004 (0.065)	0.037 (0.023)	0.102* (0.045)	0.074* (0.036)
Indexes based on binary TRIPS-plus categories pdw f – undisclosed information	0.31*** (0.05)	0.568*** (0.053)	-0.054 (0.066)	-0.133*** (0.039)	0.209*** (0.055)	-0.055 (0.066)	0.108*** (0.023)	0.112* (0.045)	0.076* (0.036)
Indexes based on binary TRIPS-plus categories pdw f – new plant varieties	-0.112** (0.037)	-0.302*** (0.041)	-0.381*** (0.049)	0.804*** (0.03)	0.267*** (0.043)	0.031 (0.051)	0.027 (0.018)	0.121*** (0.035)	-0.007 (0.028)
Indexes based on binary TRIPS-plus categories pdw f – traditional knowledge & genetic resources	-0.032 (0.047)	-0.129** (0.049)	0.237*** (0.062)	-0.047 (0.036)	0.354*** (0.052)	-0.333*** (0.062)	-0.03 (0.022)	-0.14** (0.043)	-0.136*** (0.034)
Indexes based on binary TRIPS-plus categories pdw f – encrypted program-carrying satellite signals	0.02 (0.045)	0.048 (0.047)	0.441*** (0.059)	0.029 (0.035)	0.014 (0.05)	0.414*** (0.059)	-0.084*** (0.021)	-0.317*** (0.041)	-0.02 (0.032)
Indexes based on binary TRIPS-plus categories pdw f – domain names	0.514*** (0.112)	0.302* (0.118)	-0.047 (0.148)	0.087 (0.087)	-0.294* (0.125)	0.806*** (0.148)	0.93*** (0.052)	-0.171. (0.102)	0.075 (0.082)
Indexes based on binary TRIPS-plus categories pdw f – enforcement	0.016 (0.037)	0.052 (0.039)	-0.035 (0.049)	-0.009 (0.029)	-0.014 (0.042)	0.055 (0.049)	0.031. (0.017)	0.212*** (0.034)	-0.017 (0.027)
Indexes based on binary TRIPS-plus categories pdw f – exhaustion	0.187*** (0.041)	0.056 (0.043)	0.251*** (0.054)	0.102** (0.032)	0.025 (0.046)	-0.054 (0.054)	-0.008 (0.019)	0.233*** (0.037)	0.791*** (0.029)
Control Variables									
Democratisation (Polity 2) (mean)	0 (0.002)	-0.001 (0.002)	0.004. (0.002)	0 (0.001)	-0.002 (0.002)	-0.001 (0.002)	0.001 (0.001)	-0.001 (0.001)	0 (0.001)

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**
Classic IP leaders	0.034 (0.028)	0.011 (0.03)	-0.125*** (0.037)	0.06** (0.022)	0.111*** (0.032)	-0.004 (0.038)	0.036** (0.013)	0.057* (0.026)	-0.025 (0.021)
Countries with a high increase of patent protection	-0.017 (0.019)	-0.01 (0.019)	-0.02 (0.025)	-0.001 (0.014)	-0.02 (0.02)	0.015 (0.024)	0.003 (0.009)	0 (0.017)	-0.015 (0.013)
New IP producers and developers	0.001 (0.02)	-0.032 (0.02)	0.002 (0.026)	-0.03* (0.015)	-0.023 (0.021)	-0.057* (0.025)	-0.01 (0.009)	-0.001 (0.018)	0.049*** (0.014)
ln GDP (mean)	0.007 (0.006)	0.009 (0.007)	0 (0.008)	0 (0.005)	0.007 (0.007)	-0.002 (0.008)	-0.004 (0.003)	-0.004 (0.006)	0.003 (0.005)
ln GDPpc (mean)	-0.024** (0.009)	-0.012 (0.009)	-0.006 (0.012)	0.004 (0.007)	0.006 (0.01)	0.005 (0.011)	0.002 (0.004)	-0.012 (0.008)	-0.006 (0.006)
ln Geographic distance (mean)	-0.005 (0.008)	-0.006 (0.008)	0.033** (0.01)	-0.007 (0.006)	-0.004 (0.009)	-0.007 (0.01)	0.001 (0.004)	0.006 (0.007)	0.003 (0.006)
Intercept	0.041 (0.127)	-0.114 (0.133)	-0.235 (0.168)	0.029 (0.096)	-0.169 (0.14)	0.05 (0.166)	0.098. (0.057)	0.138 (0.115)	-0.052 (0.089)
Model	m8apdwftp1_ols	m8bpdwftp3_ols	m8cpdwftp1_ols	m8dpdwftp4_ols	m8epdwftp3_ols	m8fpdwftp3_ols	m8gpdwftp4_ols	m8hpdwftp3_ols	m8ipdwftp4_ols
Observations	484	484	484	484	484	484	484	484	484

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 21 Design Regression Table 20: Path Dependency (world, force, TRIPS-plus) II

Dependent Variables	**ipr_t_epcss**	**ipr_t_domain_names**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure		
PTA members on Special 301 Reports (sum)	0.002 (0.002)	0.001 (0.002)
Veto Players		
Veto players (sum)	-0.004. (0.003)	-0.005* (0.002)
Endogeneity		
PTA depth	-0.002 (0.005)	-0.01* (0.004)
Substantial tariff cuts (dummy)	–	–
Index IPR enforcement (sum)	0.017*** (0.005)	0.025*** (0.004)
Index IPR specific enforcement (sum)	–	–
Regime Preference		
Index IPR multilateral coherence (sum)	0 (0)	0 (0)
Path Dependency		
Indexes based on binary TRIPS-plus categories pdw f – copyrights	0.033 (0.023)	0.021 (0.021)
Indexes based on binary TRIPS-plus categories pdw f – geographical indications	-0.194*** (0.055)	-0.173*** (0.048)

Dependent Variables	**ipr_t_epcss**	**ipr_t_do-main_names**
Indexes based on binary TRIPS-plus categories pdw f – industrial designs	0.041 (0.03)	-0.043 (0.026)
Indexes based on binary TRIPS-plus categories pdw f – patents	-0.198*** (0.044)	-0.152*** (0.039)
Indexes based on binary TRIPS-plus categories pdw f – undisclosed information	0.384*** (0.045)	0.164*** (0.04)
Indexes based on binary TRIPS-plus categories pdw f – new plant varieties	-0.229*** (0.033)	-0.278*** (0.029)
Indexes based on binary TRIPS-plus categories pdw f – traditional knowledge & genetic resources	0.231*** (0.042)	0.349*** (0.037)
Indexes based on binary TRIPS-plus categories pdw f – encrypted program-carrying satellite signals	0.156*** (0.041)	0.062. (0.036)
Indexes based on binary TRIPS-plus categories pdw f – domain names	0.372*** (0.101)	-0.431*** (0.089)
Indexes based on binary TRIPS-plus categories pdw f – enforcement	0.014 (0.034)	0.014 (0.03)
Indexes based on binary TRIPS-plus categories pdw f – exhaustion	-0.213*** (0.037)	-0.005 (0.032)
Control Variables		
Democratisation (Polity 2) (mean)	0 (0.001)	-0.001 (0.001)
Classic IP leaders	0.018 (0.026)	0.084*** (0.022)
Countries with a high increase of patent protection	0.019 (0.017)	-0.013 (0.015)

Dependent Variables	**ipr_t_epcss**	**ipr_t_domain_names**
New IP producers and developers	-0.015 (0.018)	0.008 (0.016)
ln GDP (mean)	0.001 (0.006)	0 (0.005)
ln GDPpc (mean)	-0.006 (0.008)	-0.006 (0.007)
ln Geographic distance (mean)	0.005 (0.007)	0.007 (0.006)
Intercept	-0.014 (0.115)	0.009 (0.101)
Model	m8jpdwftp1_ols	m8kpdwftp1_ols
Observations	484	484

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22: Design Regression Tables of the Additive Variables for the TRIPS-plus Categories

Appendix 22 Design Regression Table 1: Economic Power Asymmetry I

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**	**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Economic Power Asymmetry									
GDP asymmetry (max/sum)	-71.82 (27920)	-23.934 (19.674)	-5.954 (11.02)	0.845 (0.614)	67.9 (59260)	-58.06 (20090)	0.093 (0.289)	0.176 (0.804)	-47.24 (20530)
GDPpc asymmetry (max/sum)	17.54 (32600)	24.09 (21.764)	3.674 (13.077)	-1.254 (0.767)	91.56 (39470)	-18.85 (24350)	-0.225 (0.359)	-0.255 (1)	1.888 (19280)
GDP asymmetry * substantial tariff cuts	69.54 (27920)	0.719 (6.657)	1.323 (2.153)	-0.047 (0.1)	-105.5 (59260)	54.79 (20090)	0.044 (0.038)	0.101 (0.107)	47.82 (20530)
GDPpc asymmetry * substantial tariff cuts	-15.13 (32600)	-2.578 (6.673)	-0.352 (3.086)	-0.371*** (0.101)	-76.25 (39470)	19.2 (24350)	-0.099* (0.047)	-0.076 (0.131)	-25.91 (19280)
GDP asymmetry * ln FDI	0.109 (0.393)	0.423 (0.512)	0.037 (0.195)	-0.007 (0.01)	1.798* (0.897)	-0.073 (0.461)	0 (0.005)	-0.003 (0.013)	-1.716 (2.361)
GDPpc asymmetry * ln FDI	-0.294 (0.433)	-0.316 (0.336)	-0.095 (0.205)	0.005 (0.011)	-1.061 (1.092)	0.02 (0.567)	-0.001 (0.005)	0.004 (0.015)	1.436 (2.926)
GDP asymmetry * lnofficial development assistance and official aid received	0.087 (0.718)	0.638 (0.768)	0.167 (0.52)	-0.03 (0.031)	-0.099 (0.702)	0.168 (0.86)	-0.005 (0.015)	-0.009 (0.041)	2.127 (5.953)
GDPpc asymmetry * lnofficial development assistance and official aid received	0.033 (0.985)	-0.787 (0.99)	-0.131 (0.645)	0.063 (0.039)	0.387 (0.927)	-0.129 (1.105)	0.015 (0.018)	0.009 (0.051)	-0.547 (6.165)
GDP asymmetry * (DAC aid received by PTA members/ DAC aid received)	7.356 (8.696)	13.066 (8.287)	0.489 (6.527)	-0.297 (0.376)	11.71 (11.85)	73.33* (35.93)	-0.056 (0.177)	-0.127 (0.492)	-17.64 (22.24)

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**
GDPpc asymmetry * (DAC aid received by PTA members/ DAC aid received)	-6.614 (11.31)	-12.96 (11.602)	-2.69 (8.145)	0.376 (0.486)	-10.55 (14.56)	-122.8* (59.44)	0.08 (0.229)	-0.38 (0.637)	30.92 (32.68)
Political Pressure									
PTA members on Special 301 Reports (sum)	0.078 (0.081)	0.107 (0.084)	-0.102* (0.044)	-0.019*** (0.004)	-0.263 (0.199)	-0.403 (0.269)	-0.001 (0.002)	-0.01* (0.005)	0.444. (0.259)
Veto Players									
Veto players (sum)	-0.073 (0.079)	-0.163* (0.078)	0.085. (0.044)	0.016*** (0.003)	0.07 (0.104)	-0.152 (0.117)	-0.002 (0.002)	0.007 (0.004)	0.105 (0.131)
Endogeneity									
PTA depth	-0.006 (0.198)	0.172 (0.167)	0.195* (0.09)	–	–	0.298 (0.25)	0.009* (0.004)	-0.025* (0.01)	4.731** (1.691)
Substantial tariff cuts (dummy)	–	–	–	0.265*** (0.058)	178.2 (39300)	–	–	–	–
Index IPR enforcement (sum)	0.606*** (0.12)	0.803*** (0.14)	–	–	0.393*** (0.112)	–	–	–	–
Index IPR specific enforcement (sum)	–	–	0.144. (0.078)	0.062*** (0.008)	–	1.053*** (0.251)	0.001 (0.004)	0.105*** (0.01)	0.293 (0.27)
Regime Preference									
Index IPR multilateral coherence (sum)	0.008 (0.013)	0.003 (0.015)	0.021*** (0.005)	-0.002*** (0)	-0.019 (0.013)	-0.01 (0.017)	0. (0)	0.003*** (0.001)	0.096** (0.037)
Control Variables									
Democratisation (Polity 2) (mean)	0.012 (0.076)	-0.141. (0.082)	0.088. (0.047)	0 (0.002)	0.113 (0.069)	-0.023 (0.089)	-0.001 (0.001)	-0.003 (0.002)	-0.992** (0.352)
Classic IP leaders	-1.615* (0.707)	-1.811* (0.781)	-1.368** (0.44)	0.023 (0.036)	-1.112 (0.883)	0.106 (0.927)	0.051** (0.017)	0.168*** (0.048)	-1.919 (2.256)

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**
Countries with a high increase of patent protection	-0.701 (0.841)	0.399 (0.845)	0.701* (0.333)	0.059** (0.021)	0.859 (1.048)	0.776 (0.838)	0.008 (0.01)	0.005 (0.028)	4.584 (3.345)
New IP producers and developers	0.011 (0.636)	-0.627 (0.624)	-0.752* (0.38)	-0.075** (0.024)	-0.871 (0.688)	-0.709 (0.759)	-0.013 (0.012)	-0.034 (0.032)	-4.562* (1.989)
ln GDP (mean)	0.522 (0.408)	0.081 (0.382)	-0.089 (0.187)	-0.027** (0.01)	0.184 (0.471)	0.239 (0.415)	0 (0.005)	-0.004 (0.013)	-1.992* (0.962)
ln GDPpc (mean)	0.234 (0.57)	0.173 (0.497)	0.584* (0.233)	0.068*** (0.013)	0.832 (0.657)	-0.143 (0.529)	0.004 (0.006)	0.031. (0.017)	1.816 (1.401)
ln Geographic distance (mean)	-0.385 (0.386)	-0.464 (0.394)	0.176 (0.212)	-0.011 (0.011)	-0.136 (0.39)	-0.323 (0.455)	-0.002 (0.005)	0.03* (0.014)	1.018. (0.612)
Intercept	-17.48 (10.91)	–	–	0.07 (0.198)	-195.3 (39300)	-5.374 (9.67)	-0.023 (0.092)	-0.32 (0.256)	-2.558 (31.79)
Model	m12aepa1_op	m12bepa1_op	m12cepa3_op	m12depa4_ols	m12eepa2_p	m12fepa3_p	m12gepa3_ols	m12hepa3_ols	m12iepa3_p
Observations	392	392	392	392	392	392	392	392	392

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 2: Economic Power Asymmetry II

Dependent Variables	**ipr_t_epcss**	**ipr_t_domain_names**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Economic Power Asymmetry				
GDP asymmetry (max/sum)	-0.639 (0.679)	-0.82 (0.536)	138.4 (6596000)	1861 (2733000)
GDPpc asymmetry (max/sum)	1.181 (0.848)	1.238. (0.669)	229.3 (4783000)	-1378 (1885000)
GDP asymmetry * substantial tariff cuts	0.2. (0.11)	0.051 (0.087)	-130.8 (6596000)	-58.82 (473800)
GDPpc asymmetry * substantial tariff cuts	-0.06 (0.111)	0.094 (0.087)	-228.5 (4783000)	-336.5 (484800)
GDP asymmetry * ln FDI	0.017 (0.011)	0.016. (0.009)	0.09 (0.284)	-7.921 (61510)
GDPpc asymmetry * ln FDI	-0.016 (0.012)	-0.013 (0.01)	-0.11 (0.336)	5.632 (87590)
GDP asymmetry * lnofficial development assistance and official aid received	0.012 (0.035)	0.024 (0.027)	-0.363 (0.472)	-84.6 (74740)
GDPpc asymmetry * lnofficial development assistance and official aid received	-0.04 (0.043)	-0.05 (0.034)	0.128 (0.626)	83.43 (54680)
GDP asymmetry * (DAC aid received by PTA members/ DAC aid received)	0.333 (0.412)	0.253 (0.325)	9.576 (6.14)	3862 (4321000)
GDPpc asymmetry * (DAC aid received by PTA members/ DAC aid received)	-0.242 (0.533)	-0.512 (0.421)	-9.525 (7.859)	-6737 (7187000)

Dependent Variables	**ipr_t_epcss**	**ipr_t_do-main_names**	**ipr_trip-splus_en-forcement**	**ipr_trip-splus_ex-haustion**
Political Pressure				
PTA members on Special 301 Reports (sum)	0.008* (0.004)	0.004 (0.003)	-0.042 (0.058)	-42.98 (21990)
Veto Players				
Veto players (sum)	-0.012** (0.004)	-0.009** (0.003)	0.157** (0.05)	14.52 (19330)
Endogeneity				
PTA depth	–	–	–	–
Substantial tariff cuts (dummy)	-0.129* (0.063)	-0.11* (0.05)	354.4 (3822000)	336.5 (233600)
Index IPR enforcement (sum)	0.066*** (0.005)	0.032*** (0.004)	0.419*** (0.05)	-8.528 (7414)
Index IPR specific enforcement (sum)	–	–	–	–
Regime Preference				
Index IPR multilateral coherence (sum)	-0.001* (0.001)	0 (0)	0.025*** (0.006)	0.006 (367.2)
Control Variables				
Democratisation (Polity 2) (mean)	-0.002 (0.002)	-0.002 (0.002)	-0.025 (0.045)	3.055 (11740)
Classic IP leaders	0.032 (0.038)	0.132*** (0.03)	-0.198 (0.4)	-55.27 (54750)
Countries with a high increase of patent protection	0.031 (0.023)	-0.027 (0.018)	1.463*** (0.407)	32.8 (78030)
New IP producers and developers	0.017 (0.027)	0.031 (0.021)	-0.57 (0.428)	-78.86 (84650)

Dependent Variables	**ipr_t_epcss**	**ipr_t_domain_names**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
ln GDP (mean)	-0.001 (0.011)	0.005 (0.009)	0.38 (0.233)	11.53 (57880)
ln GDPpc (mean)	-0.04** (0.014)	-0.038*** (0.011)	-0.474. (0.284)	18.77 (27040)
ln Geographic distance (mean)	0.012 (0.012)	0.009 (0.01)	-0.265 (0.233)	1.455 (50760)
Intercept	0.279 (0.219)	0.154 (0.173)	-364.3 (3822000)	-866.3 (1259000)
Model	m12jepa2_ols	m12kepa2_ols	m12lepa2_nb	m12mepa2_p
Observations	392	392	392	392

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 3: Domestic Interests I

Dependent Variables	**ipr_t_copyrights_related_rights**			**ipr_t_trade marks**	**ipr_t_geo_indications**			**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests									
ln Charges for the use of IP, receipts (sum)	0.306 (0.291)	-4.521 (29.502)	0.794 (0.779)	0.254. (0.138)	-0.032 (0.032)	-0.028 (0.057)	-0.074 (0.068)	-0.079 (0.114)	0.743* (0.347)
ln Resident applications for patents (sum)	-0.474 (0.535)	11.303 (44.095)	-0.355 (1.621)	-0.428 (0.544)	0.322 (0.318)	1.419 (1.105)	0.545 (0.638)	-0.48 (0.782)	-0.404 (0.695)
ln Resident applications for trademarks (sum)	0.954* (0.43)	7.308 (34.093)	-0.263 (0.955)	1.571** (0.564)	-0.014 (0.239)	-0.839. (0.483)	0.244 (0.544)	0.568 (0.855)	2.211* (0.983)
ln Resident applications for industrial design (sum)	-0.57 (0.48)	-8.581 (29.931)	-0.478 (1.719)	-0.529 (0.482)	-0.144 (0.197)	-0.403 (0.588)	-0.148 (0.421)	-0.068 (0.553)	-0.492 (0.451)
ln Resident applications for patents (cumulative, sum)	-1.352. (0.82)	-5.519 (85.072)	-3.306 (2.993)	-1.155 (0.714)	-0.765* (0.326)	-1.538 (1)	-1.438* (0.688)	-0.524 (0.988)	-0.17 (1.074)
ln Resident applications for trademarks (cumulative, sum)	0.326 (0.661)	2.038 (58.717)	2.177 (1.83)	-0.27 (0.595)	0.838** (0.293)	1.226. (0.651)	1.275* (0.62)	-0.141 (1.126)	-0.289 (1.17)
ln Resident applications for industrial design (cumulative, sum)	1.241. (0.741)	2.018 (53.64)	2.055 (2.165)	0.046 (0.591)	0.397 (0.264)	0.494 (0.578)	0.788 (0.584)	1.022 (0.865)	-1.173. (0.704)
Applications for patents by PTA members / total applications for patents	0.273 (0.822)	-3.39 (26.517)	2.541 (3.494)	-2.16** (0.824)	-0.076 (0.493)	0.156 (0.558)	0.215 (1.272)	-0.004 (1.016)	-0.755 (0.823)
Applications for trademarks by PTA members / total applications for trademarks	-1.486. (0.865)	-0.559 (51.585)	-4.713 (3.72)	0.502 (0.749)	1.562*** (0.424)	0.109 (0.422)	2.616* (1.02)	1.48 (1.078)	-0.514 (0.886)
Applications for industrial designs by PTA members / total applications for industrial designs	-2.478*** (0.738)	-2.086 (58.165)	-1.389 (2.179)	0.329 (0.593)	-0.382 (0.317)	-0.292 (0.322)	-0.46 (0.833)	-0.559 (0.699)	1.344. (0.724)

Dependent Variables	**ipr_t_copyrights_related_rights**			**ipr_t_trade marks**	**ipr_t_geo_indications**			**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**
Applications for patents by PTA members / total applications for patents (cumulative)	-28.12 (296)	-161.956 (9282.251)	308.868 (626.747)	79.32 (250.3)	147.6 (97.75)	49.81 (111)	319.341 (228.679)	-1564 (979.9)	253.484 (221.208)
Applications for trademarks by PTA members / total applications for trademarks (cumulative)	-5.47 (12.81)	-0.48 (815.066)	3.954 (36.508)	6.426 (13.63)	-21.73** (7.767)	5.724 (10.93)	-40.148* (17.021)	12.73 (12.5)	17.339 (13.891)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	32.93* (13.79)	12.771 (942.404)	33.655 (41.662)	9.046 (15.36)	9.559 (6.35)	4.174 (8.01)	12.502 (15.354)	7.567 (22.09)	-26.531. (15.065)
Number of researchers in R&D (sum)	-0.407** (0.141)	0.078 (16.222)	-0.657 (0.408)	-0.192. (0.112)	-0.102. (0.055)	-0.035 (0.108)	-0.204. (0.111)	-0.19 (0.184)	-0.137 (0.145)
R&D expenditure (sum)	0.856* (0.374)	-0.039 (19.074)	3.058 (2.057)	0.944** (0.343)	-0.104 (0.18)	-0.024 (0.402)	-0.215 (0.367)	-0.36 (0.683)	0.779 (0.478)
Imports of htp by PTA members (sum)	0.27 (0.174)	0.245 (4.054)	-0.047 (0.352)	0.306. (0.169)	-0.029 (0.073)	0.184 (0.128)	-0.02 (0.153)	0.264 (0.182)	0.116 (0.181)
Imports of mhtp by PTA members (sum)	-0.288 (0.228)	-1.27 (3.263)	-0.762 (0.482)	-0.381. (0.205)	0.041 (0.095)	-0.109 (0.119)	0.131 (0.198)	-0.353 (0.337)	-0.545. (0.284)
Imports of mltp by PTA members (sum)	0.113 (0.198)	1.004 (5.963)	0.772 (0.552)	0.318. (0.176)	0.055 (0.091)	-0.075 (0.132)	-0.043 (0.198)	0.078 (0.323)	0.481* (0.237)
Imports of ltp by PTA members (sum)	0.006 (0.058)	-0.009 (1.137)	0.058 (0.118)	-0.072 (0.061)	-0.052 (0.036)	-0.068. (0.037)	-0.007 (0.086)	0.164 (0.103)	0.041 (0.076)
Imports of htp by PTA members / total htp imports	8.491 (19.89)	11.327 (433.283)	24.22 (55.891)	-73.96** (23.18)	19.57. (11.4)	12.76 (18.83)	43.201. (23.308)	-8.088 (25.97)	13.663 (20.601)
Imports of mhtp by PTA members / total mhtp imports	13.08 (17.94)	25.634 (413.25)	-9.601 (35.989)	6.1 (19.46)	-13 (9.053)	4.41 (12.28)	-34.782. (19.86)	-16.27 (20.99)	4.737 (16.408)
Imports of mltp by PTA members / total mltp imports	-104.7 (92.63)	-27.761 (2013.494)	-240.47 (322.238)	234.3* (108.9)	-51.94 (48.73)	-82.5 (87.28)	-51.809 (86.821)	164.8 (145.6)	8.563 (102.379)

Dependent Variables	**ipr_t_copyrights_related_rights**			**ipr_t_trade marks**	**ipr_t_geo_indications**			**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**
Imports of ltp by PTA members / total ltp imports	79.93 (75.08)	30.573 (1638.613)	270.606 (244.451)	-140.4 (91.34)	36.44 (35.67)	67.47 (67.91)	36.597 (68.671)	-129.5 (121.5)	-20.47 (93.294)
Political Pressure									
PTA members on Special 301 Reports (sum)	0.122 (0.129)	0.291 (5.103)	0.127 (0.428)	0.025 (0.144)	-0.174** (0.058)	-0.111 (0.068)	-0.156 (0.123)	-0.36 (0.222)	-0.038 (0.167)
Veto Players									
Veto players (sum)	0.553** (0.185)	0.506 (8.216)	0.817 (0.664)	0.017 (0.151)	-0.186. (0.096)	0.012 (0.103)	-0.532* (0.228)	-0.102 (0.201)	-0.146 (0.187)
Endogeneity									
PTA depth	0.127 (0.189)	-0.983 (5.81)	-0.146 (0.373)	–	–	–	–	–	–
Substantial tariff cuts (dummy)	–	–	–	2.14. (1.214)	1.706** (0.603)	11.55 (312.3)	3.022* (1.181)	-1.431 (1.734)	-0.671 (1.072)
Index IPR enforcement (sum)	0.692*** (0.128)	0.757 (1.42)	1.293* (0.642)	–	–	–	–	–	–
Index IPR specific enforcement (sum)	–	–	–	1.301*** (0.206)	0.195** (0.074)	0.083 (0.112)	0.494** (0.158)	1.248 (0.35)	0.883*** (0.207)
Regime Preference									
Index IPR multilateral coherence (sum)	0.017 (0.012)	0.034 (0.218)	0.032 (0.028)	0.022* (0.011)	0.017*** (0.005)	-0.001 (0.007)	0.025* (0.012)	-0.004 (0.018)	0.003 (0.012)
Control Variables									
Democratisation (Polity 2) (mean)	-0.035 (0.08)	-0.125 (0.819)	-0.092 (0.222)	0.008 (0.06)	0.136** (0.046)	0.076 (0.07)	0.29** (0.102)	-0.108 (0.094)	0.079 (0.073)
Classic IP leaders	-0.985 (1.066)	5.194 (25.901)	-3.85 (4.469)	-0.886 (0.778)	0.074 (0.451)	-0.632 (0.714)	0.767 (1.036)	0.681 (1.271)	-0.245 (1.115)

Dependent Variables	**ipr_t_copyrights_related_rights**			**ipr_t_trade marks**	**ipr_t_geo_indications**			**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**
Countries with a high increase of patent protection	-2.197** (0.818)	-2.78 (79.97)	-4.336 (2.727)	-1.809** (0.683)	0.613. (0.339)	0.079 (0.715)	2.041** (0.712)	0.435 (0.865)	-0.552 (0.694)
New IP producers and developers	-0.367 (0.65)	2.11 (10.889)	0.071 (2.593)	0.692 (0.577)	-0.037 (0.333)	-0.144 (0.527)	-0.185 (0.688)	1.32 (1.077)	1.159. (0.643)
ln GDP (mean)	1.447** (0.509)	-1.886 (9.048)	3.078. (1.682)	1.533*** (0.375)	-0.676*** (0.204)	-0.162 (0.424)	-1.673*** (0.457)	0.027 (0.548)	1.121. (0.636)
ln GDPpc (mean)	-0.108 (0.519)	4.717 (13.662)	-0.677 (1.646)	-0.437 (0.485)	0.551** (0.188)	0.09 (0.29)	1.571*** (0.471)	0.823 (0.581)	0.584 (0.557)
ln Geographic distance (mean)	-0.76* (0.386)	1.306 (10.154)	-2.12 (1.326)	0.889** (0.337)	0 (0.14)	0.07 (0.221)	0.072 (0.31)	-0.815 (0.458)	0.2 (0.39)
Intercept	–	-23.579 (460.361)	-83.292. (43.919)	–	–	-12.19 (312.4)	7.928 (8.458)	-9.843 (12.78)	–
Model	m12adi1_op	m12adi1_hp	m12adi1_hp	m12bdi4_op	m12cdi4_op	m12cdi4_hp	m12cdi4_hp	m12ddi4_p	m12edi4_op
		Count Data (Stage 2)	Zero Data (Stage 1)			Count Data (Stage 2)	Zero Data (Stage 1)		
Observations	529	529	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 4: Domestic Interests II

Dependent Variables	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_domain_names**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Domestic Interests								
ln Charges for the use of IP, receipts (sum)	0.535 (0.377)	0 (0.001)	-0.001 (0.002)	1.936 (4319)	0.003. (0.001)	0.001 (0.001)	-0.002 (0.044)	-1.58 (5729)
ln Resident applications for patents (sum)	-0.877* (0.355)	-0.002 (0.004)	0.012 (0.013)	-22.34 (48640)	-0.01 (0.01)	-0.006 (0.008)	-0.711** (0.227)	6.93 (84800)
ln Resident applications for trademarks (sum)	1.623. (0.935)	0.002 (0.003)	-0.001 (0.011)	-2.955 (16700)	0.012 (0.008)	0.007 (0.007)	0.984*** (0.291)	-3.781 (18660)
ln Resident applications for industrial design (sum)	-1.091* (0.545)	0.001 (0.003)	0.004 (0.01)	36.17 (43860)	-0.003 (0.008)	-0.004 (0.006)	-0.663** (0.206)	2.862 (78230)
ln Resident applications for patents (cumulative, sum)	-0.827 (0.827)	0.005 (0.004)	-0.008 (0.014)	-29.34 (33550)	0.017 (0.011)	0.009 (0.009)	0.419 (0.326)	-5.542 (84920)
ln Resident applications for trademarks (cumulative, sum)	-0.284 (1.04)	-0.003 (0.003)	0.006 (0.012)	14.04 (30130)	-0.011 (0.009)	0 (0.007)	-0.726* (0.34)	8.889 (25190)
ln Resident applications for industrial design (cumulative, sum)	1.082 (0.74)	-0.003 (0.004)	-0.006 (0.013)	1.974 (30800)	-0.019. (0.01)	-0.014. (0.008)	0.422 (0.324)	-8.912 (65970)
Applications for patents by PTA members / total applications for patents	0.078 (1.317)	-0.009 (0.015)	-0.007 (0.053)	-41.77 (40660)	0.049 (0.04)	0.089** (0.033)	1.938*** (0.582)	-85.47 (183900)
Applications for trademarks by PTA members / total applications for trademarks	-1.654 (1.735)	0.011 (0.011)	0.044 (0.037)	-14.09 (41810)	-0.025 (0.028)	-0.062** (0.023)	-0.199 (0.438)	21.89 (92100)
Applications for industrial designs by PTA members / total applications for industrial designs	0.419 (0.871)	0.004 (0.009)	0.014 (0.032)	11.12 (26690)	0.004 (0.024)	0.009 (0.02)	-0.54 (0.429)	1.285 (84840)

Dependent Variables	**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_do-main_names**	**ipr_trip-splus_en-forcement**	**ipr_trip-splus_ex-haustion**
Applications for patents by PTA members / total applications for patents (cumulative)	79.26 (281.2)	-1.148 (2.916)	11.55 (10.106)	-7006 (12110000)	8.164 (7.594)	11.13. (6.301)	136.9 (101)	-533.6 (21660000)
Applications for trademarks by PTA members / total applications for trademarks (cumulative)	-8.957 (36.91)	-0.09 (0.112)	-0.381 (0.387)	185.3 (332500)	-0.043 (0.291)	0.045 (0.241)	-1.259 (7.953)	-192.8 (1753000)
Applications for industrial designs by PTA members / total applications for industrial designs (cumulative)	19.52 (22.23)	0 (0.144)	-0.664 (0.497)	-420.9 (695500)	-0.112 (0.374)	-0.359 (0.31)	-5.223 (10.38)	141 (1930000)
Number of researchers in R&D (sum)	-0.181 (0.162)	0 (0.001)	-0.001 (0.004)	8.355 (5206)	-0.001 (0.003)	0 (0.002)	-0.051 (0.073)	1.269 (13530)
R&D expenditure (sum)	0.887. (0.518)	-0.001 (0.004)	0.004 (0.014)	-7.791 (14190)	-0.002 (0.01)	0.007 (0.009)	-0.32 (0.251)	0.306 (34570)
Imports of htp by PTA members (sum)	0.427* (0.217)	-0.002 (0.002)	-0.005 (0.007)	4.409 (15140)	0 (0.006)	-0.006 (0.005)	0.017 (0.087)	1.855 (9297)
Imports of mhtp by PTA members (sum)	-0.462 (0.318)	0 (0.003)	0.005 (0.009)	-3.452 (17770)	-0.018** (0.007)	-0.006 (0.006)	-0.117 (0.129)	1.375 (11130)
Imports of mltp by PTA members (sum)	-0.05 (0.25)	0.002 (0.003)	0.01 (0.009)	2.567 (11450)	0.002 (0.007)	0 (0.006)	0.129 (0.123)	-4.021 (10730)
Imports of ltp by PTA members (sum)	0.144 (0.125)	0.001 (0.001)	-0.005 (0.005)	-2.216 (2797)	0.012** (0.004)	0.008** (0.003)	0.069. (0.042)	1.752 (7838)
Imports of htp by PTA members / total htp imports	12.34 (32.08)	-0.419 (0.305)	-0.089 (1.057)	-439.7 (3045000)	-0.534 (0.795)	-0.003 (0.66)	8.343 (14.05)	-438.2 (2437000)
Imports of mhtp by PTA members / total mhtp imports	-20.77 (29.29)	-0.298 (0.189)	-0.287 (0.665)	-131.1 (2778000)	-0.245 (0.501)	-0.573 (0.415)	15.33 (10.15)	45.93 (1793000)
Imports of mltp by PTA members / total mltp imports	48.03 (186.4)	1.961. (1.094)	-2.906 (3.805)	2361 (20270000)	5.747* (2.862)	4.274. (2.375)	-106.9* (50.62)	-13.73 (9564000)

Dependent Variables	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_domain_names**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Imports of ltp by PTA members / total ltp imports	-58.04 (177.6)	-0.382 (0.806)	2.533 (2.796)	-4034 (14680000)	-1.758 (2.1)	-0.145 (1.742)	94.45* (39.32)	553.5 (10310000)
Political Pressure								
PTA members on Special 301 Reports (sum)	-0.164 (0.295)	-0.001 (0.002)	-0.008 (0.006)	5.211 (6305)	0.007. (0.004)	0.007. (0.003)	-0.358** (0.112)	-2.979 (12240)
Veto Players								
Veto players (sum)	0.198 (0.334)	-0.003 (0.002)	-0.002 (0.006)	8.008 (3593)	-0.01* (0.005)	-0.006 (0.004)	0.264** (0.097)	5.263 (8093)
Endogeneity								
PTA depth	–	–	-0.02* (0.008)	15.21 (10740)	0.001 (0.007)	-0.008 (0.005)	0.195 (0.125)	3.744 (17170)
Substantial tariff cuts (dummy)	20.26 (2326)	-0.01 (0.008)	–	–	–	–	–	–
Index IPR enforcement (sum)	–	–	–	-1.174 (3256)	0.052*** (0.005)	0.033*** (0.004)	0.562*** (0.074)	0.717 (9505)
Index IPR specific enforcement (sum)	0.737** (0.24)	0.003 (0.003)	0.113*** (0.01)	–	–	–	–	–
Regime Preference								
Index IPR multilateral coherence (sum)	0.008 (0.016)	0 (0)	0.003*** (0.001)	1.188 (1030)	-0.001 (0)	0 (0)	0.023*** (0.007)	-0.154 (903.5)
Control Variables								
Democratisation (Polity 2) (mean)	-0.09 (0.065)	-0.001 (0.001)	-0.004. (0.002)	-1.441 (1623)	-0.001 (0.002)	-0.001 (0.001)	-0.143** (0.045)	2.142 (5231)
Classic IP leaders	1.019 (1.409)	0.027* (0.013)	0.11* (0.045)	106.7 (62520)	0.012 (0.033)	0.087** (0.027)	0.184 (0.545)	0.282 (84940)

Dependent Variables	**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_do-main_names**	**ipr_trip-splus_en-forcement**	**ipr_trip-splus_ex-haustion**
Countries with a high increase of patent protection	0.679 (0.807)	0.005 (0.009)	0.002 (0.03)	3.268 (34890)	0.007 (0.023)	-0.048* (0.019)	-0.195 (0.445)	-14.07 (106100)
New IP producers and developers	0.534 (0.671)	-0.001 (0.01)	-0.008 (0.034)	12.97 (39130)	-0.019 (0.025)	0.024 (0.021)	0.232 (0.409)	-18.55 (87670)
ln GDP (mean)	0.859 (0.627)	0.003 (0.003)	-0.009 (0.012)	-13.9 (29170)	0.037*** (0.009)	0.026*** (0.007)	1.452*** (0.26)	3.241 (27570)
ln GDPpc (mean)	-0.293 (0.568)	-0.001 (0.004)	0.012 (0.013)	-13.82 (22090)	-0.023* (0.01)	-0.022** (0.008)	-0.478* (0.241)	0.223 (32980)
ln Geographic distance (mean)	-0.626 (0.479)	0 (0.004)	0.022. (0.012)	39.06 (8314)	0.01 (0.009)	0.012 (0.007)	-0.404* (0.184)	5.897 (27900)
Intercept	-49.88 (2326)	-0.05 (0.069)	-0.047 (0.238)	-84.36 (735300)	-0.747*** (0.18)	-0.513*** (0.149)	–	-199.2 (811800)
Model	m12fdi4_p	m12gdi4_ols	m12hdi3_ols	m12idi1_p	m12jdi1_ols	m12kdi1_ols	m12ldi1_op	m12mdi1_p
Observations	529	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 5: Path Dependency (general) I

Dependent Variables	ipr_t_copy-rights_re-lated_rights	ipr_t_trademarks	ipr_t_geo_indications	ipr_t_in-dus-trial_de-signs	ipr_t_patents		ipr_t_un-dis-closed_in-formation	ipr_t_lay-out_de-sign_in-teg_circuits	ipr_t_new_plant_vari-eties
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)		Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure									
PTA members on Special 301 Reports (sum)	-0.024 (0.105)	-0.064 (0.137)	-0.023 (0.078)	-0.004 (0.004)	-0.118 (0.202)	-0.18 (0.184)	-0.281 (0.228)	0.001 (0.002)	-0.011* (0.006)
Veto Players									
Veto players (sum)	0.046 (0.25)	0.141 (0.112)	-0.182 (0.188)	-0.006 (0.005)	0.114 (0.165)	0.098 (0.165)	-0.084 (0.251)	-0.001 (0.002)	0 (0.007)
Endogeneity									
PTA depth	-0.011 (0.153)	0.092 (0.139)	0.357** (0.12)	-0.006 (0.007)	–	–	–	0.005* (0.002)	-0.018* (0.008)
Substantial tariff cuts (dummy)	–	–	–	–	-1.879. (0.978)	-2.01** (0.706)	17.13 (1865)	–	–
Index IPR enforcement (sum)	0.591*** (0.108)	0.651*** (0.101)	–	–	–	–	0.448*** (0.101)	–	–
Index IPR specific enforcement (sum)	–	–	0.354** (0.111)	0.079*** (0.008)	0.896*** (0.221)	0.803*** (0.164)	–	0.003 (0.003)	0.117*** (0.01)
Regime Preference									
Index IPR multilateral coherence (sum)	0.008 (0.008)	0.003 (0.007)	0.013* (0.007)	-0.001 (0)	-0.025** (0.009)	-0.024** (0.009)	-0.001 (0.01)	0 (0)	0.003*** (0.001)
Path Dependency									
Index IPR general pd (sum)	-0.019 (0.031)	0.019 (0.03)	0.019 (0.027)	0.003. (0.002)	0.051 (0.033)	0.04 (0.034)	0.089 (0.057)	-0.001 (0.001)	0.001 (0.002)

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_patents**		**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**
Index based on binary IPR scope men-tioned pl – copyrights	0.124 (0.637)	0.724 (0.628)	-0.411 (0.518)	-0.005 (0.024)	2.192* (0.859)	1.274. (0.676)	0.087 (0.561)	0.004 (0.008)	-0.008 (0.03)
Index based on binary IPR scope men-tioned pl – trademarks	0.85 (1.094)	0.144 (1.157)	0.114 (0.789)	-0.021 (0.034)	-0.838 (1.27)	-0.106 (0.821)	-0.382 (1.059)	-0.016 (0.012)	-0.02 (0.042)
Index based on binary IPR scope men-tioned pl – geographical indications	0.23 (0.34)	-0.526. (0.298)	0.666. (0.385)	0.036 (0.024)	0.242 (0.395)	-0.467 (0.496)	-0.263 (0.444)	-0.034*** (0.008)	0.027 (0.029)
Index based on binary IPR scope men-tioned pl – industrial designs	0.562 (1.474)	-0.957 (0.821)	36.2 (11650000)	-0.009 (0.042)	1.683 (1.578)	1.321 (1.116)	-0.239 (1.286)	0.005 (0.015)	0.028 (0.053)
Index based on binary IPR scope men-tioned pl – patents	-1.216 (1.49)	0.534 (0.955)	-36.23 (11650000)	0.026 (0.048)	-2.262 (1.585)	-1.911 (1.162)	0.594 (1.509)	0.016 (0.017)	-0.019 (0.059)
Index based on binary IPR scope men-tioned pl – undisclosed information	-0.57 (0.643)	-0.265 (0.698)	-0.88 (0.573)	-0.023 (0.031)	-0.885 (0.718)	-0.146 (0.614)	-0.114 (0.58)	0.047*** (0.011)	0.003 (0.038)
Index based on binary IPR scope men-tioned pl – layout-designs of integrated cir-cuits	0.432 (0.379)	0.462 (0.306)	0.308 (0.421)	-0.002 (0.019)	-0.323 (0.419)	-0.033 (0.362)	0.066 (0.427)	-0.021** (0.007)	-0.007 (0.024)
Index based on binary IPR scope men-tioned pl – new plant varieties	-0.283. (0.155)	0.003 (0.126)	0.16 (0.125)	0.011. (0.005)	-0.09 (0.223)	-0.168 (0.221)	-0.005 (0.319)	0 (0.002)	-0.013. (0.007)
Index based on binary IPR scope men-tioned pl – traditional knowledge & genetic resources	0.067 (0.106)	0.054 (0.083)	-0.076 (0.046)	0.012** (0.004)	-0.185** (0.058)	-0.15* (0.061)	0.055 (0.196)	-0.001 (0.001)	-0.008 (0.005)
Index based on binary IPR scope men-tioned pl – encrypted program-carrying sat-ellite signals	-0.21. (0.109)	0.074 (0.128)	0.258* (0.13)	0.007 (0.007)	-0.031 (0.15)	-0.037 (0.158)	0.367 (0.276)	-0.002 (0.002)	-0.007 (0.009)
Index based on binary IPR scope men-tioned pl – domain names	0.302 (0.193)	0.243 (0.167)	0.102 (0.192)	-0.048** (0.016)	0.37. (0.22)	0.272 (0.171)	-0.095 (0.223)	-0.01. (0.005)	-0.012 (0.019)

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**		**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**
Index IPR general enforcement pd (sum)	0.02 (0.05)	-0.021 (0.051)	-0.014 (0.045)	-0.011*** (0.003)	-0.053 (0.053)	-0.036 (0.052)	-0.126 (0.086)	0 (0.001)	0.002 (0.004)
Index IPR multilateral coherence pl (dummy sum)	0.002 (0.011)	-0.015. (0.009)	0 (0.007)	0 (0)	0.013 (0.009)	0.011 (0.011)	-0.003 (0.018)	0 (0)	0 (0.001)
Control Variables									
Democratisation (Polity 2) (mean)	-0.049 (0.059)	-0.059 (0.049)	0.105* (0.048)	-0.001 (0.002)	0.023 (0.064)	0.023 (0.045)	-0.019 (0.051)	-0.001 (0.001)	-0.005* (0.002)
Classic IP leaders	-0.599 (0.459)	-0.702 (0.428)	-1.157* (0.459)	0.069* (0.034)	0.027 (0.521)	-0.029 (0.442)	1.679** (0.6)	0.027* (0.012)	0.07. (0.042)
Countries with a high increase of patent protection	-0.288 (0.452)	-0.197 (0.386)	0.971* (0.4)	0.087*** (0.022)	-0.58 (0.622)	-0.352 (0.524)	1.411** (0.454)	0.008 (0.008)	0.01 (0.027)
New IP producers and developers	-0.402 (0.412)	-0.453 (0.382)	-0.959* (0.405)	-0.005 (0.025)	0.31 (0.44)	0.445 (0.311)	-0.224 (0.485)	-0.009 (0.009)	-0.008 (0.031)
ln GDP (mean)	0.235 (0.174)	0.094 (0.151)	-0.512*** (0.142)	-0.035*** (0.008)	0.745*** (0.202)	0.823*** (0.187)	0.106 (0.207)	0.001 (0.003)	0.004 (0.01)
ln GDPpc (mean)	-0.153 (0.256)	-0.247 (0.243)	0.905*** (0.217)	0.046*** (0.01)	0.438 (0.383)	0.539 (0.397)	-0.414 (0.351)	-0.001 (0.004)	0.011 (0.013)
ln Geographic distance (mean)	-0.516* (0.251)	-0.199 (0.233)	0.298 (0.19)	-0.017. (0.009)	-0.17 (0.375)	-0.174 (0.349)	0.013 (0.348)	0.002 (0.003)	0.03* (0.012)
Intercept	–	–	-1.47 (3.173)	0.611*** (0.156)	–	–	-21.66 (1865)	-0.05 (0.055)	-0.379. (0.194)
Model	m12apdg1_op	m12bpdg1_op	m12cpdg3_nb	m12dpdg3_ols	m12epdg4_op	m12epdg4_p	m12fpdg2_p	m12gpdg3_ols	m12hpdg3_ols
Observations	529	529	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 6: Path Dependency (general) II

Dependent Variables	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_do-main_names**	**ipr_trip-splus_en-forcement**	**ipr_trip-splus_ex-haustion**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure					
PTA members on Special 301 Reports (sum)	1.027* (0.408)	-0.004 (0.004)	-0.005 (0.003)	-0.218** (0.085)	0.014 (0.009)
Veto Players					
Veto players (sum)	-3.546*** (1.063)	0.007 (0.005)	0.007. (0.004)	0.078 (0.152)	0 (0.011)
Endogeneity					
PTA depth	3.557*** (0.887)	-0.003 (0.007)	-0.017** (0.005)	0.145 (0.107)	0.017 (0.014)
Substantial tariff cuts (dummy)	–	–	–	–	–
Index IPR enforcement (sum)	–	0.053*** (0.005)	0.034*** (0.004)	0.5*** (0.069)	–
Index IPR specific enforcement (sum)	0.615* (0.275)	–	–	–	0.035* (0.016)
Regime Preference					
Index IPR multilateral coherence (sum)	0.071** (0.023)	-0.001** (0)	-0.001 (0)	0.004 (0.006)	0 (0.001)
Path Dependency					
Index IPR general pd (sum)	-0.186* (0.073)	-0.002 (0.002)	-0.003** (0.001)	-0.029 (0.026)	0.005 (0.004)
Index based on binary IPR scope mentioned pl – copyrights	2.278 (1.393)	0.051* (0.023)	0.02 (0.018)	0.857 (0.531)	-0.012 (0.051)

Dependent Variables	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_do-main_names**	**ipr_trip-splus_en-forcement**	**ipr_trip-splus_ex-haustion**
Index based on binary IPR scope mentioned pl – trademarks	-9.779* (4.447)	-0.001 (0.032)	0.037 (0.026)	-0.923 (0.936)	0.01 (0.072)
Index based on binary IPR scope mentioned pl – geographical indications	2.865* (1.158)	-0.049* (0.022)	-0.001 (0.018)	0.316 (0.273)	-0.001 (0.05)
Index based on binary IPR scope mentioned pl – industrial designs	2.671 (2.376)	0.046 (0.04)	-0.023 (0.032)	0.551 (0.809)	-0.045 (0.09)
Index based on binary IPR scope mentioned pl – patents	4.296 (3.413)	-0.042 (0.045)	-0.007 (0.036)	-0.555 (0.943)	0.027 (0.101)
Index based on binary IPR scope mentioned pl – undisclosed information	-0.742 (1.073)	0.019 (0.029)	0.005 (0.023)	-0.214 (0.49)	0.003 (0.065)
Index based on binary IPR scope mentioned pl – layout-designs of integrated circuits	0.435 (1.11)	-0.014 (0.018)	-0.015 (0.015)	0.189 (0.266)	0.016 (0.041)
Index based on binary IPR scope mentioned pl – new plant varieties	-0.571 (0.518)	0.002 (0.005)	-0.003 (0.004)	0.022 (0.102)	-0.004 (0.012)
Index based on binary IPR scope mentioned pl – traditional knowledge & genetic resources	0.054 (0.089)	-0.008* (0.004)	-0.005 (0.003)	-0.01 (0.037)	0.024** (0.009)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	0.082 (0.61)	0.002 (0.007)	-0.008 (0.005)	0.015 (0.106)	-0.022 (0.015)
Index based on binary IPR scope mentioned pl – domain names	-1.18. (0.637)	0.048** (0.015)	0.071*** (0.012)	0.357* (0.153)	-0.07* (0.033)
Index IPR general enforcement pd (sum)	0.217 (0.152)	0.002 (0.003)	0.005* (0.002)	0.04 (0.043)	-0.021** (0.006)
Index IPR multilateral coherence pl (dummy sum)	0.045. (0.026)	-0.001. (0)	-0.001. (0)	-0.007 (0.006)	0.004*** (0.001)

Dependent Variables	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_domain_names**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Control Variables					
Democratisation (Polity 2) (mean)	-0.245* (0.111)	-0.001 (0.002)	-0.001 (0.001)	-0.073. (0.039)	0 (0.004)
Classic IP leaders	1.203 (1.12)	0.017 (0.031)	0.088*** (0.025)	0.572 (0.368)	0.001 (0.072)
Countries with a high increase of patent protection	0.766 (1.28)	0.008 (0.021)	-0.038* (0.017)	-0.06 (0.324)	-0.006 (0.046)
New IP producers and developers	-0.2 (0.718)	-0.053* (0.024)	0 (0.019)	-0.459 (0.344)	0.015 (0.054)
ln GDP (mean)	-1.237** (0.479)	0.02** (0.007)	0.016** (0.006)	0.571*** (0.126)	-0.006 (0.016)
ln GDPpc (mean)	-2.023** (0.707)	-0.03** (0.01)	-0.025** (0.008)	-0.771*** (0.179)	-0.006 (0.022)
ln Geographic distance (mean)	0.292 (0.406)	0 (0.009)	0.005 (0.007)	-0.353* (0.167)	0.003 (0.02)
Intercept	–	-0.268. (0.148)	-0.22. (0.119)	–	0.116 (0.332)
Model	m12ipdg3_op	m12jpdg1_ols	m12kpdg1_ols	m12lpdg1_op	m12mpdg1_ols
Observations	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 7: Path Dependency (specific) I

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**		**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure									
PTA members on Special 301 Reports (sum)	0.012 (0.008)	0.045 (0.103)	-0.111. (0.062)	-0.002 (0.005)	-0.381. (0.215)	-0.084 (0.164)	-0.389 (0.337)	0 (0.002)	-0.002 (0.006)
Veto Players									
Veto players (sum)	0.022** (0.008)	0.073 (0.142)	-0.173 (0.133)	-0.001 (0.005)	0.002 (0.221)	0.046 (0.198)	-0.211 (0.345)	-0.002 (0.002)	0 (0.006)
Endogeneity									
PTA depth	–	0.116 (0.138)	0.163* (0.078)	–	–	0 (0)	–	0.004. (0.002)	-0.02* (0.008)
Substantial tariff cuts (dummy)	-0.055. (0.033)	–	–	-0.006 (0.02)	-2.287* (0.913)	-2.095** (0.696)	16.92 (1826)	–	–
Index IPR enforcement (sum)	–	0.604*** (0.099)	–	–	–	0 (0)	–	–	–
Index IPR specific enforcement (sum)	0.185*** (0.013)	–	0.143* (0.07)	0.076*** (0.008)	0.886*** (0.21)	0.737*** (0.166)	0.804*** (0.187)	0.004 (0.003)	0.118*** (0.01)
Regime Preference									
Index IPR multilateral coherence (sum)	0.002* (0.001)	0.002 (0.007)	0.015*** (0.005)	-0.001* (0)	-0.025* (0.01)	-0.02* (0.009)	-0.011 (0.01)	0* (0)	0.003*** (0.001)
Path Dependency									
Indexes based on binary IPR scope tangible pl – copyrights	0.018 (0.036)	0.121 (0.246)	-0.286 (0.189)	0.01 (0.021)	0.572 (0.349)	0.154 (0.264)	-0.025 (0.364)	-0.014. (0.008)	0.03 (0.027)

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_patents**		**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**
Indexes based on binary IPR scope tangible pl – trademarks	-0.045 (0.046)	-0.108 (0.31)	0.372 (0.254)	-0.064* (0.027)	-1.278** (0.427)	-0.855** (0.31)	-0.915* (0.438)	0.009 (0.01)	-0.061. (0.034)
Indexes based on binary IPR scope tangible pl – geographical indications	-0.018 (0.017)	0.046 (0.149)	0.028 (0.097)	-0.005 (0.01)	0.741* (0.289)	0.806** (0.302)	0.812** (0.254)	-0.006 (0.004)	0.032* (0.013)
Indexes based on binary IPR scope tangible pl – industrial designs	0.146*** (0.041)	0.562 (0.355)	-0.389 (0.25)	-0.075** (0.024)	1.549* (0.675)	0.913* (0.377)	0.539 (0.543)	-0.002 (0.009)	-0.016 (0.031)
Indexes based on binary IPR scope tangible pl – patents	-0.055 (0.047)	-0.515 (0.445)	0.542. (0.318)	0.114*** (0.028)	-1.221 (0.787)	-0.634 (0.425)	0.171 (0.608)	0.005 (0.01)	0.012 (0.035)
Indexes based on binary IPR scope tangible pl – undisclosed information	-0.006 (0.008)	-0.073 (0.09)	-0.023 (0.055)	-0.008. (0.005)	0.019 (0.105)	0.072 (0.108)	0.028 (0.155)	0.001 (0.002)	-0.011* (0.006)
Indexes based on binary IPR scope tangible pl – layout-designs of integrated circuits	-0.017 (0.015)	0.047 (0.065)	-0.032 (0.065)	-0.032*** (0.009)	0.068 (0.067)	0.042 (0.049)	0.071 (0.069)	0 (0.003)	0.025* (0.011)
Indexes based on binary IPR scope tangible pl – new plant varieties	-0.067* (0.03)	-0.149 (0.232)	0.05 (0.176)	0.018 (0.018)	-0.546 (0.352)	-0.362 (0.288)	-0.211 (0.402)	0.002 (0.007)	-0.004 (0.023)
Indexes based on binary IPR scope tangible pl – traditional knowledge & genetic re-sources	0.026 (0.016)	-0.073 (0.11)	0.093 (0.084)	0.001 (0.01)	-0.387* (0.179)	-0.134 (0.137)	0.038 (0.217)	0.006. (0.003)	-0.023. (0.012)
Indexes based on binary IPR scope tangible pl – encrypted program-carrying satellite signals	0.01 (0.041)	-0.04 (0.367)	0.082 (0.249)	0.028 (0.025)	-0.102 (0.427)	-0.171 (0.351)	-0.019 (0.471)	0.012 (0.009)	-0.01 (0.031)
Indexes based on binary IPR scope tangible pl – domain names	0.053 (0.04)	0.245 (0.354)	-0.335 (0.266)	-0.122*** (0.024)	0.58 (0.397)	0.423 (0.301)	0.044 (0.44)	-0.014 (0.009)	0.004 (0.03)
Index IPR specific enforcement pd (sum)	-0.002 (0.004)	-0.014 (0.025)	0.03 (0.019)	0.007** (0.002)	-0.045 (0.029)	-0.029 (0.028)	-0.041 (0.036)	0 (0.001)	0.002 (0.003)
Index IPR multilateral coherence pd (sum)	0.001 (0.001)	0.006 (0.01)	-0.013. (0.007)	0 (0.001)	0.032. (0.018)	0.008 (0.013)	-0.001 (0.021)	0 (0)	0.001 (0.001)

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_patents**		**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**
Control Variables									
Democratisation (Polity 2) (mean)	-0.006. (0.003)	-0.061 (0.049)	0.073* (0.033)	-0.002 (0.002)	0.078 (0.06)	0.037 (0.042)	0.005 (0.052)	-0.001 (0.001)	-0.004. (0.002)
Classic IP leaders	-0.148** (0.056)	-0.682 (0.441)	-0.475 (0.334)	0.048 (0.033)	-0.22 (0.584)	-0.397 (0.501)	1.491* (0.718)	0.035** (0.012)	0.079. (0.042)
Countries with a high increase of patent protection	-0.13*** (0.037)	-0.081 (0.404)	0.807** (0.289)	0.085*** (0.022)	-0.17 (0.532)	-0.504 (0.628)	1.683** (0.581)	0.005 (0.008)	0.008 (0.027)
New IP producers and developers	-0.068 (0.042)	-0.546 (0.388)	-0.31 (0.294)	-0.007 (0.025)	-0.472 (0.498)	-0.147 (0.373)	-0.694 (0.545)	-0.005 (0.009)	0.001 (0.031)
ln GDP (mean)	0.06*** (0.013)	0.002 (0.154)	-0.31** (0.1)	-0.031*** (0.007)	0.791*** (0.238)	0.856*** (0.201)	0.154 (0.2)	0.001 (0.003)	0.002 (0.009)
ln GDPpc (mean)	-0.053** (0.017)	-0.14 (0.225)	0.443** (0.143)	0.046*** (0.01)	0.203 (0.332)	0.633. (0.33)	-0.343 (0.333)	-0.002 (0.004)	0.01 (0.013)
ln Geographic distance (mean)	-0.022 (0.016)	-0.06 (0.219)	0.207. (0.121)	-0.012 (0.01)	-0.354 (0.315)	-0.384 (0.271)	-0.081 (0.322)	0.001 (0.003)	0.026* (0.012)
Intercept	-0.892*** (0.249)	–	–	0.485** (0.148)	–	-28.571*** (6.035)	-22.36 (1826)	-0.027 (0.055)	-0.302 (0.189)
Model	m12apds4_ols	m12bpds1_op	m12cpds3_op	m12dpds4_ols	m12epds4_op	m12epds4_p	m12fpds4_p	m12gpds3_ols	m12hpds3_ols
Observations	529	529	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 8: Path Dependency (specific) II

Dependent Variables	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_domain_names**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure					
PTA members on Special 301 Reports (sum)	0.722* (0.315)	-0.007 (0.004)	-0.003 (0.004)	-0.274** (0.098)	-6.314 (19150)
Veto Players					
Veto players (sum)	-1.264* (0.635)	0.005 (0.004)	0.004 (0.004)	0.124 (0.091)	1.799 (6422)
Endogeneity					
PTA depth	2.293*** (0.545)	0.012* (0.006)	-0.016** (0.005)	0.147 (0.109)	13.51 (20250)
Substantial tariff cuts (dummy)	–	–	–	–	–
Index IPR enforcement (sum)	0.152 (0.166)	–	0.035*** (0.004)	0.516*** (0.067)	-0.039 (10910)
Index IPR specific enforcement (sum)	–	0.085*** (0.007)	–	–	–
Regime Preference					
Index IPR multilateral coherence (sum)	0.039* (0.019)	-0.001** (0)	0 (0)	0.007 (0.005)	0.107 (1008)
Path Dependency					
Indexes based on binary IPR scope tangible pl – copyrights	0.371 (0.601)	-0.044* (0.02)	0.023 (0.016)	-0.19 (0.244)	27.4 (44680)
Indexes based on binary IPR scope tangible pl – trademarks	-1.421 (0.93)	0.068** (0.025)	0.017 (0.021)	0.116 (0.323)	-33.93 (36550)

Dependent Variables	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_domain_names**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Indexes based on binary IPR scope tangible pl – geographical indications	0.802 (0.837)	-0.019* (0.01)	0.008 (0.008)	-0.079 (0.152)	6.574 (33600)
Indexes based on binary IPR scope tangible pl – industrial designs	0.134 (0.242)	0.096*** (0.023)	0.073*** (0.019)	0.105 (0.291)	31.2 (37610)
Indexes based on binary IPR scope tangible pl – patents	-0.337 (0.958)	-0.069** (0.026)	-0.087*** (0.021)	-0.227 (0.374)	-19.57 (36150)
Indexes based on binary IPR scope tangible pl – undisclosed information	-0.094 (0.081)	0.005 (0.004)	-0.002 (0.003)	-0.272** (0.092)	-4.879 (26290)
Indexes based on binary IPR scope tangible pl – layout-designs of integrated circuits	0.185* (0.09)	0.034*** (0.008)	0.021** (0.007)	0.108 (0.067)	1.283 (5540)
Indexes based on binary IPR scope tangible pl – new plant varieties	0.154 (0.392)	-0.052** (0.017)	-0.041** (0.014)	-0.017 (0.211)	-4.364 (41840)
Indexes based on binary IPR scope tangible pl – traditional knowledge & genetic resources	-0.176 (0.232)	0.014 (0.009)	-0.015* (0.007)	0.024 (0.111)	-9.464 (45050)
Indexes based on binary IPR scope tangible pl – encrypted program-carrying satellite signals	-1.604 (1.026)	0.033 (0.023)	-0.026 (0.019)	0.967** (0.322)	-43.65 (84040)
Indexes based on binary IPR scope tangible pl – domain names	1.583 (0.99)	0.039. (0.022)	0.096*** (0.019)	-0.533. (0.303)	8.173 (59240)
Index IPR specific enforcement pd (sum)	-0.039 (0.031)	-0.008*** (0.002)	-0.004** (0.002)	0.025 (0.023)	0.178 (6038)
Index IPR multilateral coherence pd (sum)	0.061. (0.035)	0 (0.001)	0.001* (0)	0.011 (0.009)	0.2 (1736)
Control Variables					
Democratisation (Polity 2) (mean)	-0.092 (0.095)	0 (0.002)	-0.001 (0.001)	-0.072. (0.037)	2.476 (6561)

Dependent Variables	**ipr_t_tkgr**	**ipr_t_epcss**	**ipr_t_domain_names**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Classic IP leaders	-0.233 (1.54)	-0.003 (0.031)	0.08** (0.025)	0.336 (0.391)	0.661 (180700)
Countries with a high increase of patent protection	3.308* (1.511)	-0.022 (0.02)	-0.044** (0.017)	-0.344 (0.341)	-2.669 (101500)
New IP producers and developers	0.469 (0.73)	-0.063** (0.023)	-0.024 (0.019)	-0.677. (0.365)	-10.96 (53230)
ln GDP (mean)	-1.06** (0.371)	0.018** (0.007)	0.013* (0.006)	0.623*** (0.14)	0.854 (26500)
ln GDPpc (mean)	-0.391 (0.472)	-0.034*** (0.009)	-0.026*** (0.008)	-0.775*** (0.19)	-16.85 (36340)
ln Geographic distance (mean)	-0.301 (0.42)	0 (0.009)	0.004 (0.007)	-0.329* (0.167)	14.97 (34650)
Intercept	16.956* (7.666)	-0.199 (0.14)	-0.137 (0.115)	–	-109.6 (454800)
Model	m12ipds1_p	m12jpds3_ols	m12kpds1_ols	m12lpds1_op	m12mpds1_p
Observations	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 9: Path Dependency (TRIPS-plus) I

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**			**ipr_t_geo_indications**			**ipr_t_in-dus-trial_de-signs**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure								
PTA members on Special 301 Reports (sum)	0.015* (0.008)	0.204. (0.109)	-0.107 (0.34)	0.278 (0.183)	-0.084 (0.052)	-0.041 (0.043)	-0.012 (0.061)	-0.004 (0.004)
Veto Players								
Veto players (sum)	0.022** (0.008)	0.066 (0.094)	0.208 (0.529)	0.097 (0.176)	-0.195. (0.109)	-0.141 (0.211)	-0.314* (0.125)	0 (0.004)
Endogeneity								
PTA depth	–	0.395** (0.15)	0.627. (0.36)	0.241 (0.192)	0.25** (0.079)	-0.001 (0.104)	0.328*** (0.094)	–
Substantial tariff cuts (dummy)	-0.044 (0.033)	–	–	–	–	–	–	-0.013 (0.019)
Index IPR enforcement (sum)	–	–	–	–	–	–	–	–
Index IPR specific enforcement (sum)	0.18*** (0.013)	0.967*** (0.145)	0.264 (0.349)	1.085*** (0.231)	0.176** (0.068)	-0.067 (0.077)	0.304*** (0.082)	0.08*** (0.007)
Regime Preference								
Index IPR multilateral coherence (sum)	0.002** (0.001)	0.018* (0.008)	-0.003 (0.016)	0.034* (0.013)	0.013** (0.004)	0.01* (0.005)	0.006 (0.005)	-0.001* (0)
Path Dependency								
Indexes based on binary TRIPS-plus cate-gories pd – copyrights	0.005 (0.021)	-0.507. (0.259)	-0.411 (0.626)	-0.972* (0.444)	0.096 (0.147)	-0.098 (0.233)	0.271 (0.193)	0.004 (0.012)

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**			**ipr_t_geo_indications**			**ipr_t_industrial_designs**
Indexes based on binary TRIPS-plus categories pd – trademarks	-0.062* (0.025)	0.381 (0.286)	1.103 (0.936)	-0.067 (0.41)	-0.09 (0.179)	-0.223 (0.319)	-0.169 (0.195)	-0.07*** (0.015)
Indexes based on binary TRIPS-plus categories pd – geographical indications	0.002 (0.01)	-0.308 (0.189)	-0.733 (0.705)	0.233 (0.395)	-0.086 (0.075)	-0.188 (0.2)	-0.082 (0.082)	0.002 (0.006)
Indexes based on binary TRIPS-plus categories pd – industrial designs	0.071** (0.024)	0.097 (0.243)	-0.181 (0.591)	-0.056 (0.377)	0.071 (0.163)	0.115 (0.194)	0.154 (0.199)	0.003 (0.014)
Indexes based on binary TRIPS-plus categories pd – patents	-0.027 (0.019)	0.122 (0.164)	-0.882. (0.522)	0.675 (0.476)	-0.399** (0.131)	-0.214 (0.247)	-0.31. (0.161)	0.049*** (0.011)
Indexes based on binary TRIPS-plus categories pd – undisclosed information	-0.006 (0.011)	0.192 (0.12)	0.516 (0.579)	0.232 (0.199)	-0.015 (0.07)	0.058 (0.104)	-0.041 (0.096)	0.011 (0.007)
Indexes based on binary TRIPS-plus categories pd – layout-designs of integrated circuits	0.196*** (0.048)	3.228*** (0.647)	1.096 (0.7)	2.397. (1.372)	-0.639* (0.287)	-0.095 (0.432)	-0.89** (0.338)	-0.107*** (0.028)
Indexes based on binary TRIPS-plus categories pd – new plant varieties	-0.028 (0.026)	-0.121 (0.297)	0.74 (0.604)	-0.393 (0.42)	0.465* (0.185)	0.62 (0.386)	0.467* (0.207)	0.052*** (0.015)
Indexes based on binary TRIPS-plus categories pd – traditional knowledge & genetic resources	0.041*** (0.01)	-0.02 (0.057)	-0.118 (0.297)	0.101 (0.143)	0.081 (0.063)	0.097 (0.108)	0.114 (0.078)	-0.007 (0.006)
Indexes based on binary TRIPS-plus categories pd – encrypted program-carrying satellite signals	0.02 (0.038)	-2.088*** (0.584)	-0.771 (0.802)	-0.545 (1.326)	0.403. (0.239)	0.195 (0.426)	0.363 (0.289)	0.018 (0.022)
Indexes based on binary TRIPS-plus categories pd – domain names	0.109** (0.038)	2.012*** (0.541)	0.609 (0.586)	0.68 (1.277)	-0.385 (0.237)	-0.229 (0.402)	-0.397 (0.271)	-0.107*** (0.022)
Indexes based on binary TRIPS-plus categories pd – enforcement	-0.018. (0.009)	0.036 (0.148)	-0.092 (0.289)	-0.288 (0.362)	0.077 (0.066)	-0.019 (0.05)	0.085 (0.08)	0.005 (0.005)

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**			**ipr_t_geo_indications**			**ipr_t_in-dus-trial_de-signs**
Indexes based on binary TRIPS-plus categories pd – exhaustion	0.03* (0.015)	-0.011 (0.078)	-0.087 (0.141)	0.709 (0.507)	0.063 (0.069)	0.019 (0.037)	-0.2 (0.168)	-0.038*** (0.009)
Control Variables								
Democratisation (Polity 2) (mean)	-0.005. (0.003)	-0.052 (0.05)	-0.036 (0.059)	-0.041 (0.102)	0.09* (0.037)	0.042 (0.053)	0.096* (0.041)	0 (0.002)
Classic IP leaders	-0.17** (0.057)	-1.158* (0.468)	-0.535 (1.085)	-2.403** (0.889)	-0.422 (0.353)	-0.465 (0.544)	-0.072 (0.417)	0.038 (0.033)
Countries with a high increase of patent protection	-0.131*** (0.036)	-0.642 (0.418)	-1.52* (0.707)	0.359 (0.656)	1.016*** (0.298)	-0.139 (0.502)	1.459*** (0.347)	0.099*** (0.021)
New IP producers and developers	-0.075. (0.041)	-0.346 (0.391)	0.909 (0.693)	-0.82 (0.704)	-0.314 (0.308)	0.201 (0.379)	-0.752* (0.373)	-0.019 (0.024)
ln GDP (mean)	0.048*** (0.013)	-0.291 (0.182)	0.336 (0.543)	-0.16 (0.261)	-0.334** (0.103)	-0.006 (0.161)	-0.555*** (0.124)	-0.032*** (0.007)
ln GDPpc (mean)	-0.039* (0.017)	-0.204 (0.231)	-0.759 (0.676)	-0.081 (0.378)	0.419** (0.151)	0.041 (0.215)	0.617*** (0.181)	0.043*** (0.01)
ln Geographic distance (mean)	-0.022 (0.016)	0.047 (0.24)	0.551 (0.443)	-0.315 (0.362)	0.19 (0.127)	-0.014 (0.134)	0.265. (0.146)	-0.017. (0.009)
Intercept	-0.717** (0.248)	–	-10.776 (12.366)	1.716 (5.151)	–	0.082 (4.08)	2.939 (2.361)	0.565*** (0.145)
Model	m12apdtp4_ols	m12bpdtp3_op	m12bpdtp3_hp	m12bpdtp3_hp	m12cpdtp3_op	m12cpdtp3_hp	m12cpdtp3_hp	m12dpdtp4_ols
			Count Data (Stage 2)	Zero Data (Stage 1)		Count Data (Stage 2)	Zero Data (Stage 1)	
Observations	529	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 10: Path Dependency (TRIPS-plus) II

Dependent Variables	**ipr_t_patents**		**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**		**ipr_t_epcss**	**ipr_t_domain_names**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure									
PTA members on Special 301 Reports (sum)	-0.216 (0.245)	-0.211 (0.177)	0.014 (0.281)	0.001 (0.002)	-0.007 (0.006)	1.882** (0.58)	1.263** (0.46)	0 (0.004)	0 (0.003)
Veto Players									
Veto players (sum)	0.17 (0.181)	0.171 (0.155)	-0.095 (0.291)	-0.002 (0.002)	0.001 (0.006)	-3.869* (1.527)	-3.541** (1.211)	0.004 (0.004)	0.002 (0.003)
Endogeneity									
PTA depth	–	–	–	0.003 (0.002)	-0.016* (0.008)	1.859** (0.575)	1.715*** (0.488)	–	-0.015** (0.005)
Substantial tariff cuts (dummy)	-1.593 (0.988)	-1.232. (0.655)	17.09 (1774)	–	–	–	–	-0.013 (0.017)	–
Index IPR enforcement (sum)	–	–	–	–	–	0.485* (0.245)	0.287 (0.209)	0.05*** (0.004)	0.033*** (0.004)
Index IPR specific enforcement (sum)	0.853*** (0.191)	0.674*** (0.156)	0.733*** (0.183)	0.003 (0.003)	0.12*** (0.01)	–	–	–	–
Regime Preference									
Index IPR multilateral coherence (sum)	-0.012 (0.01)	-0.01 (0.011)	0.009 (0.013)	0 (0)	0.003*** (0.001)	0.118** (0.039)	0.13** (0.044)	-0.001** (0)	0 (0)
Path Dependency									
Indexes based on binary TRIPS-plus categories pd – copyrights	-1.218** (0.422)	-0.799* (0.351)	-0.916* (0.419)	-0.006 (0.005)	-0.027. (0.016)	-2.984*** (0.868)	-2.274** (0.738)	-0.014 (0.011)	-0.014 (0.009)

Dependent Variables	**ipr_t_patents**		**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**		**ipr_t_epcss**	**ipr_t_do-main_names**
Indexes based on binary TRIPS-plus cate-gories pd – trademarks	0.157 (0.491)	0.079 (0.352)	-0.366 (0.601)	0.007 (0.006)	0.007 (0.019)	1.038 (0.956)	0.077 (0.95)	0.039** (0.013)	0.031** (0.011)
Indexes based on binary TRIPS-plus cate-gories pd – geographical indications	0.648. (0.36)	0.76* (0.341)	0.59. (0.314)	-0.001 (0.002)	-0.001 (0.008)	-0.079 (0.761)	0.166 (1.084)	-0.005 (0.005)	0.001 (0.005)
Indexes based on binary TRIPS-plus cate-gories pd – industrial designs	0.233 (0.334)	0.129 (0.267)	-0.47 (0.456)	0.004 (0.005)	0.011 (0.018)	0.223 (0.683)	0.788. (0.441)	0.052*** (0.012)	0.027* (0.011)
Indexes based on binary TRIPS-plus cate-gories pd – patents	-0.115 (0.18)	-0.085 (0.234)	1.21* (0.56)	0.001 (0.004)	0.012 (0.014)	3.527** (1.141)	2.567* (1.25)	0.002 (0.01)	-0.009 (0.008)
Indexes based on binary TRIPS-plus cate-gories pd – undisclosed information	0.488** (0.179)	0.328* (0.157)	0.338. (0.182)	0.002 (0.002)	0.016. (0.009)	1.128** (0.343)	0.794** (0.277)	-0.006 (0.006)	-0.004 (0.005)
Indexes based on binary TRIPS-plus cate-gories pd – layout-designs of integrated cir-cuits	1.869** (0.622)	0.761. (0.409)	2.136*** (0.595)	-0.001 (0.01)	-0.006 (0.036)	3.1 (2.342)	2.623 (2.828)	0.203*** (0.025)	0.113*** (0.021)
Indexes based on binary TRIPS-plus cate-gories pd – new plant varieties	-0.567 (0.493)	-0.576 (0.363)	-0.701 (0.462)	-0.007 (0.006)	0.011 (0.02)	0.228 (0.964)	0.756 (1.148)	-0.088*** (0.014)	-0.061*** (0.012)
Indexes based on binary TRIPS-plus cate-gories pd – traditional knowledge & ge-netic resources	-0.032 (0.087)	-0.006 (0.095)	0.018 (0.122)	0 (0.002)	-0.012 (0.008)	-0.075 (0.166)	-0.161 (0.139)	-0.005 (0.005)	-0.002 (0.004)
Indexes based on binary TRIPS-plus cate-gories pd – encrypted program-carrying satellite signals	-0.825 (0.602)	-0.089 (0.392)	-1.064. (0.644)	0.001 (0.008)	-0.006 (0.028)	-4.918. (2.626)	-3.656 (2.945)	-0.007 (0.02)	-0.001 (0.017)
Indexes based on binary TRIPS-plus cate-gories pd – domain names	1.376* (0.539)	0.427 (0.314)	0.472 (0.494)	-0.006 (0.008)	-0.007 (0.029)	2.74 (2.381)	2.009 (2.81)	0.051** (0.02)	0.09*** (0.017)
Indexes based on binary TRIPS-plus cate-gories pd – enforcement	0.267 (0.509)	0.086 (0.234)	0.365 (0.434)	0.001 (0.002)	-0.009 (0.007)	-0.208 (0.715)	-0.107 (0.93)	-0.001 (0.005)	-0.002 (0.004)

Dependent Variables	**ipr_t_patents**		**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**		**ipr_t_epcss**	**ipr_t_do-main_name s**
Indexes based on binary TRIPS-plus cate-gories pd – exhaustion	0.031 (0.084)	-0.006 (0.066)	-0.027 (0.083)	0 (0.003)	-0.006 (0.011)	-0.001 (0.145)	0.064 (0.121)	0.008 (0.008)	0.022** (0.007)
Control Variables									
Democratisation (Polity 2) (mean)	0.072 (0.064)	0.009 (0.039)	-0.035 (0.045)	-0.001 (0.001)	-0.004. (0.002)	-0.253. (0.149)	-0.084 (0.138)	-0.003* (0.002)	-0.003* (0.001)
Classic IP leaders	0.044 (0.623)	-0.192 (0.644)	1.456 (0.901)	0.036** (0.012)	0.08. (0.043)	-2.286 (2.222)	-2.475 (2.248)	0.007 (0.028)	0.083*** (0.024)
Countries with a high increase of patent protection	-0.126 (0.549)	-0.345 (0.581)	1.51** (0.585)	0.006 (0.008)	0.01 (0.027)	0.292 (2.278)	2.164 (2.175)	-0.032. (0.019)	-0.061*** (0.016)
New IP producers and developers	-0.886 (0.572)	-0.365 (0.434)	-0.862 (0.635)	-0.007 (0.009)	-0.007 (0.031)	-0.098 (0.938)	0.264 (0.958)	-0.095*** (0.021)	-0.025 (0.018)
ln GDP (mean)	0.493* (0.248)	0.612** (0.237)	-0.07 (0.242)	0.002 (0.003)	0.001 (0.009)	-1.327** (0.494)	-1.462** (0.523)	0.016* (0.006)	0.012* (0.006)
ln GDPpc (mean)	0.284 (0.389)	0.633. (0.339)	-0.394 (0.398)	-0.002 (0.004)	0.01 (0.013)	-2.251* (0.984)	-1.661* (0.645)	-0.022* (0.009)	-0.021** (0.007)
ln Geographic distance (mean)	-0.061 (0.37)	-0.31 (0.264)	-0.074 (0.346)	0.001 (0.003)	0.028* (0.012)	0.718 (0.697)	0.868 (0.604)	0.002 (0.008)	0.007 (0.007)
Intercept	–	-23.424*** (6.835)	-16.9 (1774)	-0.029 (0.055)	-0.299 (0.19)	–	26.558** (8.744)	-0.212 (0.13)	-0.156 (0.111)
Model	m12epdtp4_op	m12epdtp4_p	m12fpdtp4_p	m12gpdtp3_ols	m12hpdtp3_ols	m12ipdtp1_op	m12ipdtp1_p	m12jpdtp2_ols	m12kpdtp1_ols
Observations	529	529	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 11: Path Dependency (TRIPS-plus) III

Dependent Variables	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure		
PTA members on Special 301 Reports (sum)	-0.223* (0.105)	1.826 (7652)
Veto Players		
Veto players (sum)	0.132. (0.077)	1.353 (7754)
Endogeneity		
PTA depth	0.113 (0.106)	17.09 (18510)
Substantial tariff cuts (dummy)	–	–
Index IPR enforcement (sum)	0.496*** (0.066)	0.424 (8881)
Index IPR specific enforcement (sum)	–	–
Regime Preference		
Index IPR multilateral coherence (sum)	0.015** (0.005)	0.261 (823.9)
Path Dependency		
Indexes based on binary TRIPS-plus categories pd – copyrights	0.077 (0.18)	4.018 (23590)
Indexes based on binary TRIPS-plus categories pd – trademarks	0.085 (0.263)	-9.624 (48400)

Dependent Variables	**ipr_trip-splus_en-forcement**	**ipr_trip-splus_ex-haustion**
Indexes based on binary TRIPS-plus categories pd – geographical indications	-0.005 (0.1)	-11.35 (48130)
Indexes based on binary TRIPS-plus categories pd – industrial designs	0.167 (0.204)	34.04 (22550)
Indexes based on binary TRIPS-plus categories pd – patents	0.267** (0.1)	-11.1 (49910)
Indexes based on binary TRIPS-plus categories pd – undisclosed information	-0.068 (0.087)	-2.32 (9690)
Indexes based on binary TRIPS-plus categories pd – layout-designs of integrated circuits	1.928*** (0.498)	1.371 (41110)
Indexes based on binary TRIPS-plus categories pd – new plant varieties	-0.388. (0.231)	-17.81 (39350)
Indexes based on binary TRIPS-plus categories pd – traditional knowledge & genetic resources	-0.08. (0.049)	11.52 (35350)
Indexes based on binary TRIPS-plus categories pd – encrypted program-carrying satellite signals	-0.922. (0.491)	-34.52 (46400)
Indexes based on binary TRIPS-plus categories pd – domain names	0.92* (0.427)	14.63 (36580)
Indexes based on binary TRIPS-plus categories pd – enforcement	0.084 (0.083)	2.756 (11670)
Indexes based on binary TRIPS-plus categories pd – exhaustion	-0.128. (0.074)	0.486 (4419)
Control Variables		

Dependent Variables	**ipr_trip-splus_en-forcement**	**ipr_trip-splus_ex-haustion**
Democratisation (Polity 2) (mean)	-0.069. (0.037)	2.016 (6452)
Classic IP leaders	0.015 (0.389)	-5.578 (73370)
Countries with a high increase of patent protection	-0.397 (0.339)	-5.417 (61160)
New IP producers and developers	-0.759* (0.378)	-14.4 (42360)
ln GDP (mean)	0.564*** (0.141)	7.21 (21670)
ln GDPpc (mean)	-0.75*** (0.183)	-24.66 (28980)
ln Geographic distance (mean)	-0.273 (0.167)	26.05 (25090)
Intercept	–	-308.9 (577100)
Model	m12lpdtp1_op	m12mpdtp1_p
Observations	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 12: Path Dependency (world, signature, specific) I

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure									
PTA members on Special 301 Reports (sum)	-0.002 (0.004)	0.033 (0.066)	-0.039 (0.044)	-0.001 (0.002)	-0.109 (0.106)	-0.011* (0.005)	-0.002* (0.001)	-0.013*** (0.004)	-0.684* (0.335)
Veto Players									
Veto players (sum)	0.012*** (0.004)	-0.022 (0.038)	0.119*** (0.032)	0.006*** (0.002)	0.032 (0.048)	0.008. (0.004)	-0.001 (0.001)	0.006. (0.003)	0.191. (0.112)
Endogeneity									
PTA depth	–	–	-0.259* (0.119)	-0.001 (0.004)	–	-0.001 (0.011)	–	-0.02** (0.008)	1.095. (0.664)
Substantial tariff cuts (dummy)	0.002 (0.026)	0.89 (1.331)	–	–	-3.22* (1.346)	–	-0.007 (0.005)	–	–
Index IPR enforcement (sum)	-0.059*** (0.014)	0.069 (0.153)	0.566*** (0.145)	-0.003 (0.006)	-0.592. (0.326)	-0.014 (0.018)	0.003 (0.003)	-0.025* (0.013)	0.785 (0.489)
Index IPR specific enforcement (sum)	–	–	–	–	–	–	–	–	–
Regime Preference									
Index IPR multilateral coherence (sum)	-0.005. (0.003)	-0.02 (0.021)	0.067** (0.024)	-0.004** (0.001)	-0.094** (0.035)	-0.011** (0.003)	0 (0.001)	0.004 (0.002)	-0.101 (0.126)
Path Dependency									
Indexes based on binary IPR scope tangible pdw s – copyrights	0.763*** (0.072)	0.951 (0.811)	1.33** (0.46)	0.023 (0.031)	2.212* (1.03)	0.132 (0.085)	-0.026. (0.014)	-0.004 (0.061)	-2.869 (1.826)

Dependent Variables	ipr_t_copyrights_related_rights	ipr_t_trademarks	ipr_t_geo_indications	ipr_t_industrial_designs	ipr_t_patents	ipr_t_undisclosed_information	ipr_t_layout_design_integ_circuits	ipr_t_new_plant_varieties	ipr_t_tkgr
Indexes based on binary IPR scope tangible pdw s – trademarks	-0.016 (0.072)	20.211 (3086.09)	-1.689*** (0.485)	-0.16*** (0.03)	-0.671 (1.078)	-0.004 (0.084)	0.001 (0.014)	-0.079 (0.06)	0.437 (1.969)
Indexes based on binary IPR scope tangible pdw s – geographical indications	0.057 (0.045)	0.209 (0.376)	4.11*** (0.523)	0.049* (0.019)	1.715* (0.709)	0.254*** (0.054)	0.003 (0.009)	0.192*** (0.038)	-1.047 (1.188)
Indexes based on binary IPR scope tangible pdw s – industrial designs	-0.141. (0.076)	-0.084 (0.476)	1.846*** (0.544)	0.753*** (0.033)	0.648 (0.624)	0.472*** (0.09)	0.048** (0.015)	-0.079 (0.065)	6.561. (3.874)
Indexes based on binary IPR scope tangible pdw s – patents	-0.001 (0.074)	-0.22 (0.454)	-0.621 (0.465)	0.079* (0.032)	1.026 (0.873)	-0.269** (0.087)	-0.028* (0.014)	0.05 (0.063)	-5.748. (2.938)
Indexes based on binary IPR scope tangible pdw s – undisclosed information	-0.223*** (0.062)	0.369 (0.427)	-0.677. (0.404)	-0.209*** (0.026)	0.114 (0.564)	0.699*** (0.073)	0.063*** (0.012)	0.085 (0.052)	5.045* (2.553)
Indexes based on binary IPR scope tangible pdw s – layout-designs of integrated circuits	0.838*** (0.115)	1.334* (0.664)	-0.026 (1.018)	0.167*** (0.049)	1.831* (0.879)	0.171 (0.135)	0.416*** (0.022)	0.444*** (0.096)	10.225* (4.607)
Indexes based on binary IPR scope tangible pdw s – new plant varieties	-0.239** (0.077)	-0.245 (0.494)	-1.835*** (0.506)	-0.007 (0.033)	-0.098 (0.698)	-0.592*** (0.091)	-0.052*** (0.015)	0.589*** (0.065)	1.868 (1.51)
Indexes based on binary IPR scope tangible pdw s – traditional knowledge & genetic resources	-0.064 (0.066)	0.837. (0.453)	-1.144** (0.44)	-0.026 (0.028)	-1.652. (0.89)	0.212** (0.077)	0.027* (0.013)	0.043 (0.055)	6.397** (2.05)
Indexes based on binary IPR scope tangible pdw s – encrypted program-carrying satellite signals	-0.395*** (0.08)	0.855. (0.448)	-0.888 (0.608)	0.114*** (0.034)	1.351. (0.8)	0.597*** (0.094)	0.108*** (0.015)	0.113. (0.067)	-24.16 (4485.467)
Indexes based on binary IPR scope tangible pdw s – domain names	0.988*** (0.109)	0.622 (0.555)	-1.645* (0.826)	-0.314*** (0.046)	3.423** (1.06)	1.611*** (0.128)	-0.03 (0.021)	0.033 (0.092)	1.709 (4.504)
Index IPR specific enforcement pdw s (sum)	0.178*** (0.025)	0.318. (0.188)	-0.601** (0.226)	0.03** (0.011)	0.783* (0.395)	-0.034 (0.03)	-0.017*** (0.005)	0.104*** (0.022)	-1.548. (0.86)

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**	**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**
Index IPR multilateral coherence pdw s (sum)	0.03* (0.014)	0.093 (0.12)	-0.241* (0.12)	0.019*** (0.006)	0.507** (0.181)	0.044** (0.016)	0.002 (0.003)	0 (0.012)	0.63 (0.649)
Control Variables									
Democratisation (Polity 2) (mean)	-0.002 (0.002)	-0.016 (0.044)	0.028 (0.046)	-0.001 (0.001)	0.078 (0.077)	-0.005. (0.003)	0 (0)	-0.003. (0.002)	0.014 (0.225)
Classic IP leaders	-0.168*** (0.044)	-0.934* (0.438)	-0.589 (0.434)	-0.068*** (0.019)	0.649 (0.698)	0.146** (0.052)	0.016. (0.008)	0.083* (0.037)	0.297 (2.892)
Countries with a high increase of patent protection	-0.001 (0.028)	-0.347 (0.424)	1.095** (0.42)	0.017 (0.012)	-0.355 (0.807)	0.073* (0.033)	-0.006 (0.005)	0.006 (0.024)	-0.536 (2.382)
New IP producers and developers	-0.022 (0.031)	0.116 (0.299)	-0.639. (0.367)	-0.009 (0.013)	0.696 (0.572)	0.023 (0.037)	0.006 (0.006)	-0.003 (0.026)	1.117 (1.642)
ln GDP (mean)	0.018. (0.01)	-0.057 (0.204)	-0.294* (0.139)	-0.003 (0.004)	0.336 (0.275)	0.001 (0.012)	0.003 (0.002)	0.005 (0.008)	0.276 (0.569)
ln GDPpc (mean)	0.01 (0.013)	0.144 (0.25)	1.004*** (0.226)	0.009 (0.006)	0.347 (0.37)	-0.008 (0.016)	-0.001 (0.003)	0.02. (0.011)	-1.531 (0.977)
ln Geographic distance (mean)	-0.028* (0.013)	-0.072 (0.279)	-0.188 (0.153)	-0.007 (0.005)	-0.307 (0.395)	-0.027. (0.014)	0.002 (0.002)	0.007 (0.01)	-0.364 (0.825)
Intercept	-0.321 (0.196)	-23.338 (3086.095)	–	0.062 (0.084)	–	0.22 (0.232)	-0.07. (0.037)	-0.32. (0.166)	-2.853 (13.053)
Model	m12apdwss2_ols	m12bpdwss2_op	m12cpdwss1_op	m12dpdwss1_ols	m12epdwss2_op	m12fpdwss1_ols	m12gpdwss2_ols	m12hpdwss1_ols	m12ipdwss1_p
Observations	529	529	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 13: Path Dependency (world, signature, specific) II

Dependent Variables	**ipr_t_epcss**	**ipr_t_do-main_names**	**ipr_trip-splus_en-forcement**	**ipr_trip-splus_ex-haustion**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure				
PTA members on Special 301 Reports (sum)	0 (0.001)	0 (0)	-0.182*** (0.055)	1.823 (16510)
Veto Players				
Veto players (sum)	0 (0.001)	0 (0)	0.252*** (0.035)	-0.786 (3856)
Endogeneity				
PTA depth	0 (0.002)	0 (0)	-0.139 (0.136)	9.774 (23240)
Substantial tariff cuts (dummy)	–	–	–	–
Index IPR enforcement (sum)	0.003 (0.003)	0 (0)	0.669*** (0.164)	-21.26 (119700)
Index IPR specific enforcement (sum)	–	–	–	–
Regime Preference				
Index IPR multilateral coherence (sum)	0 (0.001)	0 (0)	0.051* (0.023)	0.75 (914.6)
Path Dependency				
Indexes based on binary IPR scope tangible pdw s – copyrights	0.021 (0.014)	0* (0)	1.942*** (0.462)	88.68 (268900)
Indexes based on binary IPR scope tangible pdw s – trademarks	0.01 (0.014)	0 (0)	-1.013* (0.508)	-57.47 (102900)

Dependent Variables	**ipr_t_epcss**	**ipr_t_domain_names**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Indexes based on binary IPR scope tangible pdw s – geographical indications	0.01 (0.009)	0 (0)	1.102*** (0.334)	4.587 (72160)
Indexes based on binary IPR scope tangible pdw s – industrial designs	-0.011 (0.015)	0*** (0)	1.061* (0.455)	67.2 (71380)
Indexes based on binary IPR scope tangible pdw s – patents	-0.041** (0.014)	0*** (0)	0.374 (0.452)	7.747 (85960)
Indexes based on binary IPR scope tangible pdw s – undisclosed information	0.045*** (0.012)	0*** (0)	-0.201 (0.364)	-24.13 (54470)
Indexes based on binary IPR scope tangible pdw s – layout-designs of integrated circuits	0.007 (0.022)	0*** (0)	-1.433* (0.644)	-15.14 (34480)
Indexes based on binary IPR scope tangible pdw s – new plant varieties	-0.023 (0.015)	0. (0)	0.259 (0.427)	-6.242 (76420)
Indexes based on binary IPR scope tangible pdw s – traditional knowledge & genetic resources	-0.02 (0.013)	0 (0)	0.123 (0.431)	-34.52 (76450)
Indexes based on binary IPR scope tangible pdw s – encrypted program-carrying satellite signals	0.95*** (0.015)	0*** (0)	2.12*** (0.48)	6.285 (117400)
Indexes based on binary IPR scope tangible pdw s – domain names	0.031 (0.021)	1*** (0)	1.132. (0.672)	53.92 (278200)
Index IPR specific enforcement pdw s (sum)	0.002 (0.005)	0 (0)	-0.482* (0.216)	19.84 (140000)
Index IPR multilateral coherence pdw s (sum)	-0.003 (0.003)	0 (0)	-0.169 (0.114)	-1.622 (2227)
Control Variables				

Dependent Variables	**ipr_t_epcss**	**ipr_t_domain_names**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Democratisation (Polity 2) (mean)	0 (0)	0 (0)	-0.095* (0.043)	1.329 (23850)
Classic IP leaders	-0.006 (0.008)	0 (0)	0.694 (0.462)	16.47 (47540)
Countries with a high increase of patent protection	-0.003 (0.005)	0 (0)	-0.085 (0.415)	-33.58 (121000)
New IP producers and developers	-0.002 (0.006)	0 (0)	-0.361 (0.393)	21.21 (86310)
ln GDP (mean)	0.001 (0.002)	0 (0)	0.763*** (0.153)	-8.402 (33250)
ln GDPpc (mean)	-0.002 (0.003)	0 (0)	-0.793*** (0.214)	-7.402 (71170)
ln Geographic distance (mean)	-0.003 (0.002)	0 (0)	-0.597*** (0.181)	11.51 (59140)
Intercept	0.019 (0.038)	0 (0)	–	79.94 (594400)
Model	m12jpdwss1_ols	m12kpdwss1_ols	m12lpdwss1_op	m12mpdwss1_p
Observations	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 14: Path Dependency (world, signature, TRIPS-plus) I

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure									
PTA members on Special 301 Reports (sum)	0.007** (0.003)	0.089 (0.083)	-0.047 (0.031)	0 (0)	-0.228 (0.198)	0.001 (0.004)	0 (0)	0.005** (0.002)	0.309 (4621)
Veto Players									
Veto players (sum)	-0.014*** (0.003)	-0.03 (0.039)	0.067** (0.025)	0 (0)	-0.002 (0.048)	-0.017*** (0.004)	0 (0)	-0.005*** (0.002)	-0.197 (2136)
Endogeneity									
PTA depth	–	0.257 (0.18)	–	–	0.176 (0.238)	–	–	-0.002 (0.003)	0.27 (7574)
Substantial tariff cuts (dummy)	-0.008 (0.016)	–	0.698 (1.055)	0 (0)	–	-0.005 (0.026)	0 (0)	–	–
Index IPR enforcement (sum)	0.006 (0.005)	–	–	0 (0)	0.097 (0.145)	0.012 (0.009)	0 (0)	–	-0.093 (3893)
Index IPR specific enforcement (sum)	–	0.161 (0.156)	-0.102 (0.071)	–	–	–	–	0.005 (0.006)	–
Regime Preference									
Index IPR multilateral coherence (sum)	0 (0)	-0.004 (0.009)	0.007. (0.004)	0 (0)	-0.005 (0.009)	0 (0.001)	0 (0)	0 (0)	0.013 (255.1)
Path Dependency									
Indexes based on binary TRIPS-plus categories pdw s – copyrights	0.006 (0.026)	-1.795. (1.068)	-0.031 (0.643)	0 (0)	-0.278 (0.552)	0.056 (0.043)	0 (0)	0.007 (0.015)	0.313 (45930)

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**
Indexes based on binary TRIPS-plus categories pdw s – geographical indications	0.627*** (0.059)	0.008 (0.636)	-0.069 (0.341)	0*** (0)	0.836 (0.841)	-0.176. (0.096)	0. (0)	0.128*** (0.034)	0.027 (8876)
Indexes based on binary TRIPS-plus categories pdw s – industrial designs	-0.028 (0.044)	-0.856 (16170)	-0.258 (11580)	0 (0)	-0.512 (38340)	-0.111 (0.071)	0 (0)	-0.048. (0.025)	-2.18 (61020)
Indexes based on binary TRIPS-plus categories pdw s – patents	1.138*** (0.046)	-0.176 (0.598)	0.215 (0.352)	0*** (0)	-0.005 (0.77)	-0.046 (0.075)	0*** (0)	0.057* (0.027)	0.28 (19680)
Indexes based on binary TRIPS-plus categories pdw s – undisclosed information	0.178*** (0.049)	24.57 (15260)	0.114 (0.432)	0*** (0)	0.17 (0.818)	0.183* (0.079)	0*** (0)	0.07* (0.028)	0.212 (5376)
Indexes based on binary TRIPS-plus categories pdw s – layout-designs of integrated circuits	-0.12*** (0.034)	0.121 (0.385)	24.05 (11090)	0*** (0)	-0.333 (0.71)	0.134* (0.055)	0 (0)	0.007 (0.019)	-0.6 (22800)
Indexes based on binary TRIPS-plus categories pdw s – new plant varieties	0.023 (0.037)	-0.48 (0.458)	0.352 (0.303)	1*** (0)	-0.617 (0.537)	-0.463*** (0.061)	0** (0)	-0.021 (0.023)	1.847 (53320)
Indexes based on binary TRIPS-plus categories pdw s – traditional knowledge & genetic resources	0.269*** (0.047)	0.361 (0.457)	-0.055 (0.293)	0 (0)	26.87 (35470)	0.198* (0.077)	0*** (0)	-0.212*** (0.027)	0.293 (58960)
Indexes based on binary TRIPS-plus categories pdw s – encrypted program-carrying satellite signals	0.121** (0.045)	0.11 (0.516)	-0.136 (0.401)	0 (0)	-0.954 (1.022)	1.633*** (0.074)	0** (0)	0.01 (0.026)	1.615 (47280)
Indexes based on binary TRIPS-plus categories pdw s – domain names	-0.535*** (0.112)	-0.126 (0.946)	-0.379 (1.097)	0 (0)	0.348 (1.203)	-0.013 (0.182)	1*** (0)	0.068 (0.065)	0.287 (355500)
Indexes based on binary TRIPS-plus categories pdw s – enforcement	-0.032 (0.037)	-0.028 (0.513)	-0.179 (0.245)	0 (0)	0.62 (1.273)	0.025 (0.06)	0 (0)	1.118*** (0.022)	0.778 (23150)
Indexes based on binary TRIPS-plus categories pdw s – exhaustion	-0.051 (0.038)	-0.076 (0.386)	-0.083 (0.224)	0 (0)	-0.123 (0.585)	-0.088 (0.062)	0 (0)	0.059** (0.022)	29.3 (52640)

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**	**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**
Control Variables									
Democratisation (Polity 2) (mean)	-0.001 (0.001)	-0.039 (0.041)	0.012 (0.042)	0 (0)	0.008 (0.05)	-0.003 (0.002)	0 (0)	0 (0.001)	0.151 (2968)
Classic IP leaders	0.089** (0.028)	-0.232 (0.431)	-0.291 (0.339)	0 (0)	1.404. (0.799)	0.325*** (0.045)	0 (0)	0.018 (0.016)	-0.986 (34410)
Countries with a high increase of patent protection	0.007 (0.018)	-0.535 (0.437)	-0.183 (0.357)	0 (0)	0 (0.883)	0.082** (0.029)	0 (0)	0 (0.01)	-1.93 (24050)
New IP producers and developers	-0.011 (0.019)	0.298 (0.258)	-0.032 (0.252)	0 (0)	-0.079 (0.338)	0.054. (0.031)	0 (0)	-0.004 (0.011)	-0.435 (6682)
ln GDP (mean)	-0.004 (0.006)	0.131 (0.181)	0.076 (0.129)	0 (0)	0.003 (0.314)	-0.023* (0.01)	0 (0)	-0.007. (0.004)	0.291 (6862)
ln GDPpc (mean)	0.003 (0.008)	-0.258 (0.247)	-0.002 (0.178)	0 (0)	-0.441 (0.372)	-0.005 (0.014)	0 (0)	0.007 (0.005)	-0.678 (6399)
ln Geographic distance (mean)	0.012 (0.008)	0.248 (0.242)	0.025 (0.118)	0 (0)	-0.151 (0.347)	0.012 (0.013)	0 (0)	0.007. (0.004)	0.146 (9137)
Intercept	0.007 (0.121)	-27.62 (5346)	-25.98 (3315)	0* (0)	-21.86 (14560)	0.512** (0.197)	0 (0)	0.061 (0.07)	-31.6 (223200)
Model	m12apdwstp1_ols	m12bpdwstp3_p	m12cpdwstp4_p	m12dpdwstp2_ols	m12epdwstp1_p	m12fpdwstp2_ols	m12gpdwstp2_ols	m12hpdwstp3_ols	m12ipdwstp1_p
Observations	529	529	529	529	529	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 15: Path Dependency (world, signature, TRIPS-plus) II

Dependent Variables	**ipr_t_epcss**	**ipr_t_domain_names**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure				
PTA members on Special 301 Reports (sum)	0.003 (0.002)	0.001 (0.002)	-0.119** (0.041)	-1.03 (9274)
Veto Players				
Veto players (sum)	-0.005* (0.002)	-0.005** (0.002)	0.097*** (0.019)	-0.168 (8509)
Endogeneity				
PTA depth	-0.001 (0.005)	-0.007. (0.004)	0.04 (0.077)	8.585 (21570)
Substantial tariff cuts (dummy)	–	–	–	–
Index IPR enforcement (sum)	0.017*** (0.005)	0.02*** (0.004)	0.089* (0.043)	-3.624 (8444)
Index IPR specific enforcement (sum)	–	–	–	–
Regime Preference				
Index IPR multilateral coherence (sum)	-0.001 (0)	0 (0)	0.005 (0.004)	0.01 (258.3)
Path Dependency				
Indexes based on binary TRIPS-plus categories pdw s – copyrights	0.034 (0.023)	0.018 (0.019)	0.403 (0.376)	14.14 (71490)
Indexes based on binary TRIPS-plus categories pdw s – geographical indications	-0.166** (0.051)	-0.146*** (0.043)	-0.169 (0.3)	33.04 (157600)

Dependent Variables	**ipr_t_epcss**	**ipr_t_domain_names**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Indexes based on binary TRIPS-plus categories pdw s – industrial designs	0.044 (0.038)	0.087** (0.032)	36.65 (3166000)	3.902 (70720)
Indexes based on binary TRIPS-plus categories pdw s – patents	-0.129** (0.04)	-0.106** (0.034)	-0.035 (0.238)	-3.943 (102400)
Indexes based on binary TRIPS-plus categories pdw s – undisclosed information	0.357*** (0.042)	0.093** (0.036)	0.69* (0.304)	-2.143 (94760)
Indexes based on binary TRIPS-plus categories pdw s – layout-designs of integrated circuits	0.025 (0.029)	-0.145*** (0.025)	0.142 (0.208)	-23.5 (31950)
Indexes based on binary TRIPS-plus categories pdw s – new plant varieties	-0.249*** (0.032)	-0.25*** (0.028)	-0.054 (0.212)	-2.242 (30510)
Indexes based on binary TRIPS-plus categories pdw s – traditional knowledge & genetic resources	0.152*** (0.041)	0.349*** (0.035)	0.397. (0.232)	10.15 (46670)
Indexes based on binary TRIPS-plus categories pdw s – encrypted program-carrying satellite signals	0.23*** (0.039)	0.086* (0.034)	-0.298 (0.277)	22.62 (54450)
Indexes based on binary TRIPS-plus categories pdw s – domain names	0.468*** (0.097)	-0.399*** (0.083)	-0.038 (0.521)	20.1 (342100)
Indexes based on binary TRIPS-plus categories pdw s – enforcement	-0.009 (0.032)	-0.007 (0.028)	0.124 (0.222)	52.5 (76780)
Indexes based on binary TRIPS-plus categories pdw s – exhaustion	-0.241*** (0.033)	-0.026 (0.028)	-0.144 (0.223)	-31.52 (37610)
Control Variables				
Democratisation (Polity 2) (mean)	0 (0.001)	0 (0.001)	0.016 (0.027)	5.751 (9120)

Dependent Variables	**ipr_t_epcss**	**ipr_t_do-main_names**	**ipr_trip-splus_en-forcement**	**ipr_trip-splus_ex-haustion**
Classic IP leaders	0.023 (0.024)	0.082*** (0.021)	0.047 (0.259)	10.97 (59390)
Countries with a high increase of patent protection	0.014 (0.015)	0.004 (0.013)	0.055 (0.243)	-9.233 (92770)
New IP producers and developers	-0.01 (0.017)	0.01 (0.014)	-0.188 (0.191)	-1.567 (30140)
ln GDP (mean)	0 (0.005)	-0.006 (0.005)	0.572*** (0.111)	-13.81 (10350)
ln GDPpc (mean)	-0.009 (0.007)	-0.002 (0.006)	-0.69*** (0.143)	-0.454 (29720)
ln Geographic distance (mean)	0.005 (0.007)	0.008 (0.006)	-0.197. (0.119)	17 (30730)
Intercept	0.029 (0.106)	0.1 (0.091)	-44.37 (3166000)	90.01 (298000)
Model	m12jpdwstp1_ols	m12kpdwstp1_ols	m12lpdwstp1_nb	m12mpdwstp1_p
Observations	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 16: Path Dependency (world, force, specific) I

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure									
PTA members on Special 301 Reports (sum)	-0.002 (0.004)	0.004 (0.076)	-0.041 (0.046)	-0.001 (0.002)	-0.145 (0.129)	-0.01* (0.005)	-0.002** (0.001)	-0.013*** (0.004)	1.247 (4890)
Veto Players									
Veto players (sum)	0.013** (0.004)	-0.011 (0.04)	0.144*** (0.035)	0.006*** (0.002)	0.051 (0.051)	0.007. (0.004)	-0.001 (0.001)	0.005 (0.003)	-0.033 (1960)
Endogeneity									
PTA depth	-0.002 (0.01)	-0.133 (0.181)	-0.266* (0.121)	-0.002 (0.004)	–	–	–	-0.022** (0.008)	-1.877 (20650)
Substantial tariff cuts (dummy)	–	–	–	–	-3.748* (1.502)	0.021 (0.03)	-0.008 (0.006)	–	–
Index IPR enforcement (sum)	-0.058*** (0.015)	0.101 (0.168)	0.647*** (0.154)	-0.002 (0.006)	-0.602. (0.352)	-0.019 (0.015)	0.003 (0.003)	-0.024. (0.013)	-20.64 (13810)
Index IPR specific enforcement (sum)	–	–	–	–	–	–	–	–	–
Regime Preference									
Index IPR multilateral coherence (sum)	-0.005. (0.003)	-0.019 (0.026)	0.06* (0.025)	-0.003** (0.001)	-0.122** (0.04)	-0.012*** (0.003)	0 (0.001)	0.004. (0.003)	4.391 (4320)
Path Dependency									
Indexes based on binary IPR scope tangible pdw f – copyrights	0.804*** (0.074)	0.863 (0.806)	1.385** (0.465)	-0.001 (0.031)	2.395* (1.056)	0.24** (0.079)	-0.032* (0.014)	0.009 (0.064)	22.36 (50610)

Dependent Variables	**ipr_t_copy-rights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**
Indexes based on binary IPR scope tangible pdw f – trademarks	-0.007 (0.074)	20.66 (3270)	-2.107*** (0.526)	-0.156*** (0.031)	-0.888 (1.114)	-0.046 (0.079)	0.004 (0.014)	-0.052 (0.064)	76.56 (42260)
Indexes based on binary IPR scope tangible pdw f – geographical indications	0.038 (0.047)	0.336 (0.386)	4.191*** (0.532)	0.051* (0.02)	1.792* (0.727)	0.28*** (0.05)	0.002 (0.009)	0.186*** (0.041)	11.84 (25240)
Indexes based on binary IPR scope tangible pdw f – industrial designs	-0.19* (0.079)	-0.03 (0.484)	1.838** (0.567)	0.781*** (0.034)	0.646 (0.639)	0.303*** (0.084)	0.058*** (0.015)	-0.069 (0.068)	56.61 (95490)
Indexes based on binary IPR scope tangible pdw f – patents	0.024 (0.077)	-0.272 (0.454)	-0.526 (0.48)	0.055. (0.032)	1.126 (0.935)	-0.125 (0.082)	-0.037* (0.015)	0.034 (0.066)	-99.66 (52090)
Indexes based on binary IPR scope tangible pdw f – undisclosed information	-0.268*** (0.066)	0.32 (0.449)	-0.54 (0.422)	-0.18*** (0.028)	0.398 (0.616)	0.521*** (0.07)	0.073*** (0.013)	0.076 (0.057)	-48.83 (57900)
Indexes based on binary IPR scope tangible pdw f – layout-designs of integrated circuits	0.813*** (0.116)	1.189. (0.651)	0.411 (1.102)	0.181*** (0.049)	2.152* (0.972)	0.11 (0.124)	0.42*** (0.023)	0.446*** (0.1)	10.21 (83800)
Indexes based on binary IPR scope tangible pdw f – new plant varieties	-0.246** (0.08)	-0.116 (0.536)	-1.867*** (0.521)	-0.009 (0.034)	0.017 (0.772)	-0.528*** (0.085)	-0.057*** (0.015)	0.571*** (0.069)	-10.92 (50540)
Indexes based on binary IPR scope tangible pdw f – traditional knowledge & genetic resources	-0.096 (0.071)	0.951. (0.539)	-1.656*** (0.493)	0.009 (0.03)	-2.14* (0.95)	-0.003 (0.076)	0.04** (0.014)	0.075 (0.061)	126.4 (57480)
Indexes based on binary IPR scope tangible pdw f – encrypted program-carrying satellite signals	-0.432*** (0.082)	0.883. (0.471)	-1.104. (0.653)	0.134*** (0.035)	1.351 (0.859)	0.52*** (0.087)	0.112*** (0.016)	0.102 (0.071)	-64.41 (64040)
Indexes based on binary IPR scope tangible pdw f – domain names	0.88*** (0.116)	0.783 (0.642)	-2.68* (1.058)	-0.238*** (0.049)	3.334** (1.12)	1.203*** (0.124)	-0.006 (0.023)	0.057 (0.1)	146.7 (134900)
Index IPR specific enforcement pdw f (sum)	0.186*** (0.026)	0.284 (0.196)	-0.639** (0.233)	0.025* (0.011)	0.851* (0.416)	-0.009 (0.027)	-0.019*** (0.005)	0.099*** (0.023)	30.71 (19590)

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**	**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**
Index IPR multilateral coherence pdw f (sum)	0.03* (0.014)	0.085 (0.144)	-0.196 (0.126)	0.017** (0.006)	0.648** (0.207)	0.051*** (0.015)	0.002 (0.003)	-0.003 (0.012)	-24.95 (21810)
Control Variables									
Democratisation (Polity 2) (mean)	-0.003 (0.003)	-0.006 (0.046)	0.028 (0.051)	-0.001 (0.001)	0.087 (0.082)	-0.005. (0.003)	-0.001 (0)	-0.004. (0.002)	-0.747 (7248)
Classic IP leaders	-0.199*** (0.046)	-1.103. (0.59)	-1.237* (0.514)	-0.049* (0.019)	0.133 (0.851)	0.068 (0.049)	0.022* (0.009)	0.093* (0.04)	28.66 (76210)
Countries with a high increase of patent protection	-0.012 (0.03)	-0.407 (0.516)	1.002* (0.468)	0.027* (0.013)	-0.806 (1.007)	0.046 (0.033)	–	0.013 (0.026)	10.77 (28580)
New IP producers and developers	-0.039 (0.032)	0.093 (0.314)	-0.947* (0.415)	-0.001 (0.014)	0.571 (0.611)	-0.024 (0.035)	0.008 (0.006)	-0.011 (0.028)	7.179 (17510)
ln GDP (mean)	0.021* (0.01)	-0.043 (0.227)	-0.296* (0.149)	-0.006 (0.004)	0.396 (0.295)	0.009 (0.011)	0.003 (0.002)	0.004 (0.009)	-5.991 (12540)
ln GDPpc (mean)	0.014 (0.014)	0.219 (0.26)	1.123*** (0.242)	0.01. (0.006)	0.337 (0.378)	-0.008 (0.015)	-0.001 (0.003)	0.025* (0.012)	11.68 (22980)
ln Geographic distance (mean)	-0.031* (0.013)	-0.213 (0.287)	-0.131 (0.155)	-0.008 (0.005)	-0.384 (0.402)	-0.027. (0.014)	0.002 (0.003)	0.007 (0.011)	1.45 (12040)
Intercept	-0.399. (0.209)	-22.28 (3270)	–	0.113 (0.089)	–	0.039 (0.221)	-0.06 (0.04)	-0.306. (0.181)	-23.74 (476100)
Model	m12apdwfs1_ols	m12bpdwfs1_p	m12cpdwfs1_op	m12dpdwfs1_ols	m12epdwfs2_op	m12fpdwfs2_ols	m12gpdwfs2_ols	m12hpdwfs1_ols	m12ipdwfs1_p
Observations	484	484	484	484	484	484	484	484	484

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 17: Path Dependency (world, force, specific) II

Dependent Variables	**ipr_t_epcss**	**ipr_t_do-main_names**	**ipr_trip-splus_en-forcement**	**ipr_trip-splus_ex-haustion**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure				
PTA members on Special 301 Reports (sum)	0.137 (0.503)	0 (2899)	-0.19** (0.058)	1.692 (18760)
Veto Players				
Veto players (sum)	0.045 (0.733)	0 (5504)	0.246*** (0.035)	-1.326 (4548)
Endogeneity				
PTA depth	0.194 (0.746)	0 (5953)	-0.103 (0.14)	9.609 (51240)
Substantial tariff cuts (dummy)	–	–	–	–
Index IPR enforcement (sum)	-0.058 (0.605)	0 (2456)	0.595*** (0.165)	-17.83 (72350)
Index IPR specific enforcement (sum)	–	–	–	–
Regime Preference				
Index IPR multilateral coherence (sum)	0.007 (0.096)	0 (122.1)	0.036 (0.024)	0.916 (3164)
Path Dependency				
Indexes based on binary IPR scope tangible pdw f – copyrights	20.4 (15190)	0 (152100)	1.874*** (0.465)	86.22 (164500)
Indexes based on binary IPR scope tangible pdw f – trademarks	18.98 (15040)	0 (155100)	-1.056* (0.526)	-52.08 (122100)

Dependent Variables	**ipr_t_epcss**	**ipr_t_domain_names**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Indexes based on binary IPR scope tangible pdw f – geographical indications	1.283 (2.599)	0 (91180)	1.045** (0.345)	10.67 (147600)
Indexes based on binary IPR scope tangible pdw f – industrial designs	-0.132 (4.016)	0 (121300)	0.984* (0.461)	69.4 (182900)
Indexes based on binary IPR scope tangible pdw f – patents	-0.498 (3.681)	0 (131400)	0.404 (0.459)	0.57 (68540)
Indexes based on binary IPR scope tangible pdw f – undisclosed information	-0.464 (3.366)	0 (115500)	-0.395 (0.38)	-25.05 (75570)
Indexes based on binary IPR scope tangible pdw f – layout-designs of integrated circuits	2.66 (4.222)	0 (262100)	-1.318* (0.651)	-12.21 (43530)
Indexes based on binary IPR scope tangible pdw f – new plant varieties	-23.45 (99880)	0 (130700)	0.51 (0.443)	-6.623 (69490)
Indexes based on binary IPR scope tangible pdw f – traditional knowledge & genetic resources	1.419 (5.241)	0 (137700)	-0.046 (0.452)	-31.28 (58710)
Indexes based on binary IPR scope tangible pdw f – encrypted program-carrying satellite signals	2.543 (2.752)	0 (93080)	2.136*** (0.483)	3.339 (82380)
Indexes based on binary IPR scope tangible pdw f – domain names	2.712 (5.463)	27.3 (104500)	0.782 (0.704)	63.01 (273000)
Index IPR specific enforcement pdw f (sum)	0.284 (0.952)	0 (6475)	-0.381. (0.218)	14.29 (88210)
Index IPR multilateral coherence pdw f (sum)	-0.264 (0.713)	0 (3456)	-0.097 (0.12)	-2.05 (7426)
Control Variables				

Dependent Variables	**ipr_t_epcss**	**ipr_t_domain_names**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Democratisation (Polity 2) (mean)	0.022 (0.141)	0 (98.11)	-0.08. (0.044)	1.477 (33140)
Classic IP leaders	-5.758 (8.507)	0 (55080)	0.178 (0.508)	24.03 (53040)
Countries with a high increase of patent protection	-1.204 (2.388)	0 (67860)	-0.533 (0.458)	-17.58 (160200)
New IP producers and developers	0.004 (1.074)	0 (7769)	-0.762. (0.435)	24.29 (110500)
ln GDP (mean)	2.232 (3.11)	0 (19270)	0.832*** (0.157)	-10.1 (27500)
ln GDPpc (mean)	-1.913 (1.888)	0 (15500)	-0.792*** (0.216)	-4.385 (51720)
ln Geographic distance (mean)	0.29 (1.227)	0 (1733)	-0.536** (0.183)	2.77 (96540)
Intercept	-86.73 (21370)	-27.3 (363400)	–	156.3 (716700)
Model	m12jpdwfs1_p	m12kpdwfs1_p	m12lpdwfs1_op	m12mpdwfs1_p
Observations	484	484	484	484

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 18: Path Dependency (world, force, TRIPS-plus) I

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**	**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure									
PTA members on Special 301 Reports (sum)	0.007* (0.003)	0.087 (0.081)	-0.058. (0.032)	0*** (0)	-0.191 (0.266)	0.001 (0.003)	0 (0)	0.005** (0.002)	0.251 (5962)
Veto Players									
Veto players (sum)	-0.014*** (0.003)	-0.025 (0.038)	0.108*** (0.026)	0 (0)	-0.015 (0.052)	-0.01** (0.003)	0 (0)	-0.006*** (0.002)	-0.179 (6843)
Endogeneity									
PTA depth	–	0.236 (0.168)	-0.096 (0.078)	0. (0)	0.188 (0.285)	-0.003 (0.007)	–	-0.002 (0.003)	0.261 (14640)
Substantial tariff cuts (dummy)	-0.015 (0.018)	–	–	–	–	–	0 (0)	–	–
Index IPR enforcement (sum)	0.011* (0.006)	–	–	–	0.12 (0.162)	0.01 (0.006)	0 (0)	–	-0.049 (6589)
Index IPR specific enforcement (sum)	–	0.165 (0.156)	-0.118 (0.078)	0 (0)	–	–	–	0.004 (0.006)	–
Regime Preference									
Index IPR multilateral coherence (sum)	0 (0)	-0.004 (0.01)	0.014** (0.004)	0 (0)	-0.006 (0.009)	0 (0)	0 (0)	0 (0)	0.022 (628.1)
Path Dependency									
Indexes based on binary TRIPS-plus cate-gories pdw f – copyrights	0.008 (0.028)	-1.693 (1.081)	-0.723 (0.667)	0 (0)	-0.257 (0.583)	0.035 (0.03)	0 (0)	0.007 (0.016)	-0.575 (48540)

Dependent Variables	**ipr_t_copyrights_related_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_industrial_designs**	**ipr_t_patents**	**ipr_t_undisclosed_information**	**ipr_t_layout_design_integ_circuits**	**ipr_t_new_plant_varieties**	**ipr_t_tkgr**
Indexes based on binary TRIPS-plus categories pdw f – geographical indications	0.58*** (0.064)	0.024 (0.786)	-0.223 (0.407)	0*** (0)	0.883 (1.186)	-0.186** (0.071)	0. (0)	0.134*** (0.037)	-0.291 (81730)
Indexes based on binary TRIPS-plus categories pdw f – industrial designs	-0.139*** (0.035)	-0.704 (16380)	21.66 (1230)	0*** (0)	-0.828 (38950)	0.005 (0.039)	0 (0)	-0.039. (0.02)	-1.778 (66220)
Indexes based on binary TRIPS-plus categories pdw f – patents	1.119*** (0.052)	-0.313 (0.721)	0.804* (0.358)	0*** (0)	-0.105 (1.272)	-0.047 (0.057)	0*** (0)	0.057. (0.03)	-0.912 (27430)
Indexes based on binary TRIPS-plus categories pdw f – undisclosed information	0.216*** (0.053)	24.55 (15380)	-1.281** (0.391)	0*** (0)	0.077 (1.199)	0.097. (0.059)	0*** (0)	0.071* (0.03)	-0.102 (38050)
Indexes based on binary TRIPS-plus categories pdw f – new plant varieties	0.01 (0.039)	-0.511 (0.505)	0.464 (0.284)	1*** (0)	-0.638 (0.612)	-0.318*** (0.043)	0** (0)	-0.023 (0.023)	2.548 (68730)
Indexes based on binary TRIPS-plus categories pdw f – traditional knowledge & genetic resources	0.273*** (0.05)	0.319 (0.468)	0.175 (0.293)	0 (0)	26.8 (35830)	0.15** (0.055)	0*** (0)	-0.211*** (0.028)	1.512 (80400)
Indexes based on binary TRIPS-plus categories pdw f – encrypted program-carrying satellite signals	0.104* (0.047)	0.262 (0.517)	0.675* (0.33)	0 (0)	-0.813 (1.729)	1.615*** (0.053)	0** (0)	0.01 (0.027)	0.918 (42020)
Indexes based on binary TRIPS-plus categories pdw f – domain names	-0.555*** (0.119)	-0.002 (0.92)	0.931 (1.117)	0 (0)	0.456 (1.577)	0.078 (0.132)	1*** (0)	0.069 (0.068)	-0.819 (341100)
Indexes based on binary TRIPS-plus categories pdw f – enforcement	-0.015 (0.039)	-0.018 (0.509)	-0.493. (0.256)	0 (0)	0.748 (1.24)	0.017 (0.044)	0 (0)	1.112*** (0.023)	-0.774 (39570)
Indexes based on binary TRIPS-plus categories pdw f – exhaustion	-0.022 (0.043)	0.021 (0.418)	0.136 (0.253)	0 (0)	-0.16 (0.641)	-0.063 (0.048)	0 (0)	0.066** (0.025)	29.01 (61900)
Control Variables									
Democratisation (Polity 2) (mean)	-0.001 (0.002)	-0.033 (0.039)	0.134** (0.044)	0 (0)	0.002 (0.053)	-0.002 (0.002)	0 (0)	0 (0.001)	0.162 (4152)

Dependent Variables	**ipr_t_copy-rights_re-lated_rights**	**ipr_t_trademarks**	**ipr_t_geo_indications**	**ipr_t_in-dus-trial_de-signs**	**ipr_t_pa-tents**	**ipr_t_un-dis-closed_in-formation**	**ipr_t_lay-out_de-sign_in-teg_circuits**	**ipr_t_new_plant_vari-eties**	**ipr_t_tkgr**
Classic IP leaders	0.086** (0.03)	-0.535 (0.645)	-1.436*** (0.369)	0** (0)	1.233 (1.712)	0.131*** (0.033)	0 (0)	0.019 (0.017)	-1.113 (92570)
Countries with a high increase of patent protection	-0.008 (0.02)	-0.706 (0.548)	0.897** (0.33)	0 (0)	-0.415 (1.805)	0.015 (0.022)	0 (0)	0.001 (0.011)	-0.678 (66800)
New IP producers and developers	-0.015 (0.021)	0.208 (0.297)	-0.438 (0.279)	0 (0)	-0.082 (0.4)	-0.008 (0.023)	0 (0)	-0.006 (0.012)	-0.212 (16510)
ln GDP (mean)	0.001 (0.007)	0.155 (0.182)	-0.163 (0.117)	0 (0)	0.075 (0.304)	-0.005 (0.007)	0 (0)	-0.007. (0.004)	0.056 (13690)
ln GDPpc (mean)	0 (0.009)	-0.201 (0.227)	0.477** (0.159)	0 (0)	-0.495 (0.381)	0 (0.01)	0 (0)	0.009. (0.005)	-0.045 (21000)
ln Geographic distance (mean)	0.009 (0.009)	0.219 (0.259)	0.07 (0.108)	0 (0)	-0.172 (0.355)	0.007 (0.009)	0 (0)	0.008 (0.005)	0.099 (9225)
Intercept	-0.063 (0.132)	-28.42 (5620)	-22.55 (1230)	0 (0)	-23 (15270)	0.072 (0.149)	0. (0)	0.065 (0.077)	-30.96 (330600)
Model	m12apdwftp2_ols	m12bpdwftp3_p	m12cpdwftp3_p	m12dpdwftp3_ols	m12epdwftp1_p	m12fpdwftp1_ols	m12gpdwftp2_ols	m12hpdwftp3_ols	m12ipdwftp1_p
Observations	484	484	484	484	484	484	484	484	484

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 22 Design Regression Table 19: Path Dependency (world, force, TRIPS-plus) II

Dependent Variables	**ipr_t_epcss**	**ipr_t_do-main_names**	**ipr_trip-splus_en-forcement**	**ipr_trip-splus_ex-haustion**
Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure				
PTA members on Special 301 Reports (sum)	0.002 (0.002)	0.001 (0.002)	-0.145** (0.046)	-2.945 (23860)
Veto Players				
Veto players (sum)	-0.004 (0.003)	-0.005* (0.002)	0.111*** (0.02)	0.943 (28880)
Endogeneity				
PTA depth	0.002 (0.005)	-0.01* (0.004)	–	–
Substantial tariff cuts (dummy)	–	–	0.253 (0.731)	-7.545 (144200)
Index IPR enforcement (sum)	–	0.025*** (0.004)	0.105* (0.044)	-9.588 (7519)
Index IPR specific enforcement (sum)	0.029** (0.009)	–	–	–
Regime Preference				
Index IPR multilateral coherence (sum)	0 (0)	0 (0)	0.003 (0.004)	-0.011 (819)
Path Dependency				
Indexes based on binary TRIPS-plus categories pdw f – copyrights	0.037 (0.023)	0.021 (0.021)	0.622. (0.374)	15.29 (626400)

Dependent Variables	**ipr_t_epcss**	**ipr_t_domain_names**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Indexes based on binary TRIPS-plus categories pdw f – geographical indications	-0.198*** (0.055)	-0.173*** (0.048)	-0.084 (0.348)	55.81 (96710)
Indexes based on binary TRIPS-plus categories pdw f – industrial designs	0.064* (0.029)	-0.043 (0.026)	36.74 (3309000)	41.43 (334000)
Indexes based on binary TRIPS-plus categories pdw f – patents	-0.175*** (0.044)	-0.152*** (0.039)	-0.295 (0.254)	65.44 (323600)
Indexes based on binary TRIPS-plus categories pdw f – undisclosed information	0.389*** (0.045)	0.164*** (0.04)	0.7* (0.293)	8.332 (232900)
Indexes based on binary TRIPS-plus categories pdw f – new plant varieties	-0.26*** (0.035)	-0.278*** (0.029)	-0.032 (0.219)	-19.71 (131300)
Indexes based on binary TRIPS-plus categories pdw f – traditional knowledge & genetic resources	0.155*** (0.042)	0.349*** (0.037)	0.244 (0.238)	20.92 (52080)
Indexes based on binary TRIPS-plus categories pdw f – encrypted program-carrying satellite signals	0.23*** (0.04)	0.062. (0.036)	-0.119 (0.269)	7.158 (170700)
Indexes based on binary TRIPS-plus categories pdw f – domain names	0.441*** (0.102)	-0.431*** (0.089)	0.264 (0.584)	104 (489100)
Indexes based on binary TRIPS-plus categories pdw f – enforcement	-0.021 (0.034)	0.014 (0.03)	0.166 (0.217)	43.48 (136200)
Indexes based on binary TRIPS-plus categories pdw f – exhaustion	-0.219*** (0.037)	-0.005 (0.032)	0.023 (0.222)	-57.78 (120600)
Control Variables				
Democratisation (Polity 2) (mean)	0.001 (0.001)	-0.001 (0.001)	0.034 (0.026)	13.15 (54810)
Classic IP leaders	0.002 (0.026)	0.084*** (0.022)	-0.638. (0.333)	56.24 (104900)

Dependent Variables	**ipr_t_epcss**	**ipr_t_domain_names**	**ipr_tripsplus_enforcement**	**ipr_tripsplus_exhaustion**
Countries with a high increase of patent protection	0.007 (0.017)	-0.013 (0.015)	-0.379 (0.289)	-12.48 (83670)
New IP producers and developers	-0.01 (0.018)	0.008 (0.016)	-0.473* (0.21)	26.07 (45440)
ln GDP (mean)	0.003 (0.006)	0 (0.005)	0.689*** (0.112)	-14.32 (57580)
ln GDPpc (mean)	-0.009 (0.008)	-0.006 (0.007)	-0.61*** (0.134)	-26.95 (148700)
ln Geographic distance (mean)	0.003 (0.007)	0.007 (0.006)	-0.25* (0.116)	43.17 (298700)
Intercept	-0.014 (0.114)	0.009 (0.101)	-47.57 (3309000)	38.78 (2243000)
Model	m12jpdwftp3_ols	m12kpdwftp1_ols	m12lpdwftp2_nb	m12mpdwftp2_p
Observations	484	484	484	484

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 23: List of US PTAs: Stringent IPR Indexes & Political Pressure I

PTA	Members	year_signature	year_entry_into_force	ipr_specific_sum	ipr_scope_tangible_sum	ipr_specific_enforcement_sum	ipr_multilateral_coherence_bindingness_sum	ipr_tripsplus_per_pta	special_301_report_pta_members_sum
Australia US	AU-US	2004	2005	14	8	6	56	37	0
Bahrain US	BH-US	2004	2006	12	6	6	55	35	0
Canada US	CA-US	1988	1989	0	0	0	0	0	0
Canada US Automotive Products Trade Agreement (APTA)	CA-US	1965	1966	0	0	0	0	0	0
Central American Free Trade Agreement (CAFTA)	CR-SV-GT-HN-NI-US	2004	2004	13	6	7	69	33	2
Central American Free Trade Agreement (CAFTA) Dominican Republic	CR-SV-GT-HN-NI-US-DO	2004	2006	13	6	7	64	34	3
Chile US	CL-US	2003	2004	12	6	6	51	31	1
Colombia US	CO-US	2006	2012	12	6	6	66	34	1
Colombia US environmental side agreement	CO-US	2013	2013	1	1	0	0	0	1
Israel US	IL-US	1985	1985	0	0	0	40	0	0
Jordan US	JO-US	2000	2001	7	4	3	25	17	0
Korea US	KR-US	2007	2012	12	6	6	71	33	1
Korea US environmental side agreement	KR-US	2012	2012	2	2	0	2	0	0
Laos US	LA-US	2003	2005	12	7	5	31	25	0
Morocco US	MA-US	2004	2006	12	6	6	58	39	0
North American Free Trade Agreement (NAFTA)	CA-MX-US	1992	1994	12	8	4	20	22	1
Oman US	OM-US	2006	2009	12	6	6	57	35	0
Panama US	PA-US	2007	2012	12	6	6	74	35	0
Panama US environmental side agreement	PA-US	2012	2012	1	1	0	0	0	0
Peru US	PE-US	2006	2009	12	6	6	74	36	1
Singapore US	SG-US	2003	2004	11	6	5	44	27	0
Trans-Pacific Partnership (TPP)	US-MX-CA-AU-MY-CL-SG-PE-VN-NZ-BN-JP	2016	NA	15	9	6	65	42	5
US Vietnam	US-VN	2000	2001	11	7	4	31	24	1

Appendix 24: List of US PTAs: Stringent IPR Indexes & Political Pressure II

PTA	Members	year_signature	year_entry_into_force	ipr_t_copyrights_related_rights	ipr_t_trademarks	ipr_t_geo_indications	ipr_t_industrial_designs	ipr_t_patents	ipr_t_undisclosed_information	special_301_report_pta_members_sum
Australia US	AU-US	2004	2005	1	1	1	1	1	1	0
Bahrain US	BH-US	2004	2006	1	1	1	0	1	0	0
Canada US	CA-US	1988	1989	0	0	0	0	0	0	0
Canada US Automotive Products Trade Agreement (APTA)	CA-US	1965	1966	0	0	0	0	0	0	0
Central American Free Trade Agreement (CAFTA)	CR-SV-GT-HN-NI-US	2004	2004	1	1	1	0	1	0	2
Central American Free Trade Agreement (CAFTA) Dominican Republic	CR-SV-GT-HN-NI-US-DO	2004	2006	1	1	1	0	1	0	3
Chile US	CL-US	2003	2004	1	1	1	0	1	0	1
Colombia US	CO-US	2006	2012	1	1	1	0	1	0	1
Colombia US environmental side agreement	CO-US	2013	2013	0	0	0	0	0	1	1
Israel US	IL-US	1985	1985	0	0	0	0	0	0	0
Jordan US	JO-US	2000	2001	1	1	1	0	1	0	0
Korea US	KR-US	2007	2012	1	1	1	0	1	0	1
Korea US environmental side agreement	KR-US	2012	2012	1	0	0	0	0	1	0
Laos US	LA-US	2003	2005	1	1	0	1	1	1	0
Morocco US	MA-US	2004	2006	1	1	1	0	1	0	0
North American Free Trade Agreement (NAFTA)	CA-MX-US	1992	1994	1	1	1	1	1	1	1
Oman US	OM-US	2006	2009	1	1	1	0	1	0	0
Panama US	PA-US	2007	2012	1	1	1	0	1	0	0
Panama US environmental side agreement	PA-US	2012	2012	0	0	0	0	0	1	0
Peru US	PE-US	2006	2009	1	1	1	0	1	0	1
Singapore US	SG-US	2003	2004	1	1	1	0	1	0	0
Trans-Pacific Partnership (TPP)	US-MX-CA-AU-MY-CL-SG-PE-VN-NZ-BN-JP	2016	NA	1	1	1	1	1	1	5
US Vietnam	US-VN	2000	2001	1	1	0	1	1	1	1

Appendix 25: List of US PTAs: Stringent IPR Indexes & Political Pressure III

PTA	Members	year_signature	year_entry_into_force	ipr_t_layout_design_integ_circuits	ipr_t_new_plant_varieties	ipr_t_trad_knowledge_genetic_resources	ipr_t_encrypted_program_carrying_satellite_signals	ipr_t_domain_names	special_301_report_pta_members_sum
Australia US	AU-US	2004	2005	0	0	0	1	1	0
Bahrain US	BH-US	2004	2006	0	0	0	1	1	0
Canada US	CA-US	1988	1989	0	0	0	0	0	0
Canada US Automotive Products Trade Agreement (APTA)	CA-US	1965	1966	0	0	0	0	0	0
Central American Free Trade Agreement (CAFTA)	CR-SV-GT-HN-NI-US	2004	2004	0	0	0	1	1	2
Central American Free Trade Agreement (CAFTA) Dominican Republic	CR-SV-GT-HN-NI-US-DO	2004	2006	0	0	0	1	1	3
Chile US	CL-US	2003	2004	0	0	0	1	1	1
Colombia US	CO-US	2006	2012	0	0	0	1	1	1
Colombia US environmental side agreement	CO-US	2013	2013	0	0	0	0	0	1
Israel US	IL-US	1985	1985	0	0	0	0	0	0
Jordan US	JO-US	2000	2001	0	0	0	0	0	0
Korea US	KR-US	2007	2012	0	0	0	1	1	1
Korea US environmental side agreement	KR-US	2012	2012	0	0	0	0	0	0
Laos US	LA-US	2003	2005	1	0	0	1	0	0
Morocco US	MA-US	2004	2006	0	0	0	1	1	0
North American Free Trade Agreement (NAFTA)	CA-MX-US	1992	1994	1	0	0	1	0	1
Oman US	OM-US	2006	2009	0	0	0	1	1	0
Panama US	PA-US	2007	2012	0	0	0	1	1	0
Panama US environmental side agreement	PA-US	2012	2012	0	0	0	0	0	0
Peru US	PE-US	2006	2009	0	0	0	1	1	1
Singapore US	SG-US	2003	2004	0	0	0	1	1	0
Trans-Pacific Partnership (TPP)	US-MX-CA-AU-MY-CL-SG-PE-VN-NZ-BN-JP	2016	NA	0	0	1	1	1	5
US Vietnam	US-VN	2000	2001	1	0	0	1	0	1

Appendix 26: List of US PTAs: Stringent IPR Indexes & Political Pressure IV

PTA	Members	year_signature	year_entry_into_force	ipr_tripsplus_copyrights_related_rights	ipr_tripsplus_trademarks	ipr_tripsplus_geo_indications	ipr_tripsplus_industrial_design	ipr_tripsplus_patents	special_301_report_pta_members_sum
Australia US	AU-US	2004	2005	2	5	0	0	5	0
Bahrain US	BH-US	2004	2006	2	5	0	0	5	0
Canada US	CA-US	1988	1989	0	0	0	0	0	0
Canada US Automotive Products Trade Agreement (APTA)	CA-US	1965	1966	0	0	0	0	0	0
Central American Free Trade Agreement (CAFTA)	CR-SV-GT-HN-NI-US	2004	2004	2	4	0	0	5	2
Central American Free Trade Agreement (CAFTA) Dominican Republic	CR-SV-GT-HN-NI-US-DO	2004	2006	2	4	0	0	6	3
Chile US	CL-US	2003	2004	2	4	0	0	5	1
Colombia US	CO-US	2006	2012	2	4	0	0	6	1
Colombia US environmental side agreement	CO-US	2013	2013	0	0	0	0	0	1
Israel US	IL-US	1985	1985	0	0	0	0	0	0
Jordan US	JO-US	2000	2001	1	0	0	0	3	0
Korea US	KR-US	2007	2012	2	5	0	0	4	1
Korea US environmental side agreement	KR-US	2012	2012	0	0	0	0	0	0
Laos US	LA-US	2003	2005	0	2	0	1	3	0
Morocco US	MA-US	2004	2006	2	5	0	0	6	0
North American Free Trade Agreement (NAFTA)	CA-MX-US	1992	1994	0	2	1	1	3	1
Oman US	OM-US	2006	2009	2	5	0	0	4	0
Panama US	PA-US	2007	2012	2	4	0	0	6	0
Panama US environmental side agreement	PA-US	2012	2012	0	0	0	0	0	0
Peru US	PE-US	2006	2009	2	4	0	0	6	1
Singapore US	SG-US	2003	2004	2	1	0	0	4	0
Trans-Pacific Partnership (TPP)	US-MX-CA-AU-MY-CL-SG-PE-VN-NZ-BN-JP	2016	NA	2	4	1	0	5	5
US Vietnam	US-VN	2000	2001	0	1	0	1	5	1

Appendix 27: List of US PTAs: Stringent IPR Indexes & Political Pressure V

PTA	Members	year_signature	year_entry_into_force	ipr_tripsplus_undisclosed_information	ipr_tripsplus_layout_design	ipr_tripsplus_new_plant_varieties	ipr_tripsplus_trad_knowledge_genetic_resources	ipr_tripsplus_encrypted_program_carrying_satellite_signals	special_301_report_pta_members_sum
Australia US	AU-US	2004	2005	3	0	1	0	1	0
Bahrain US	BH-US	2004	2006	3	0	1	0	1	0
Canada US	CA-US	1988	1989	0	0	0	0	0	0
Canada US Automotive Products Trade Agreement (APTA)	CA-US	1965	1966	0	0	0	0	0	0
Central American Free Trade Agreement (CAFTA)	CR-SV-GT-HN-NI-US	2004	2004	2	0	1	0	1	2
Central American Free Trade Agreement (CAFTA) Dominican Republic	CR-SV-GT-HN-NI-US-DO	2004	2006	2	0	1	0	1	3
Chile US	CL-US	2003	2004	1	0	1	0	1	1
Colombia US	CO-US	2006	2012	2	0	1	0	1	1
Colombia US environmental side agreement	CO-US	2013	2013	0	0	0	0	0	1
Israel US	IL-US	1985	1985	0	0	0	0	0	0
Jordan US	JO-US	2000	2001	1	0	1	0	0	0
Korea US	KR-US	2007	2012	3	0	1	0	1	1
Korea US environmental side agreement	KR-US	2012	2012	0	0	0	0	0	0
Laos US	LA-US	2003	2005	2	1	1	0	1	0
Morocco US	MA-US	2004	2006	3	0	1	0	1	0
North American Free Trade Agreement (NAFTA)	CA-MX-US	1992	1994	2	1	1	0	1	1
Oman US	OM-US	2006	2009	3	0	1	0	1	0
Panama US	PA-US	2007	2012	2	0	1	0	1	0
Panama US environmental side agreement	PA-US	2012	2012	0	0	0	0	0	0
Peru US	PE-US	2006	2009	2	0	1	0	1	1
Singapore US	SG-US	2003	2004	2	0	1	0	1	0
Trans-Pacific Partnership (TPP)	US-MX-CA-AU-MY-CL-SG-PE-VN-NZ-BN-JP	2016	NA	6	0	1	0	1	5
US Vietnam	US-VN	2000	2001	0	1	1	0	1	1

Appendix 28: List of US PTAs: Stringent IPR Indexes & Political Pressure VI

PTA	Members	year_signature	year_entry_into_force	ipr_tripsplus_domain_names	ipr_tripsplus_enforcement	ipr_tripsplus_exhaustion	special_301_report_pta_members_sum
Australia US	AU-US	2004	2005	1	17	2	0
Bahrain US	BH-US	2004	2006	1	17	0	0
Canada US	CA-US	1988	1989	0	0	0	0
Canada US Automotive Products Trade Agreement (APTA)	CA-US	1965	1966	0	0	0	0
Central American Free Trade Agreement (CAFTA)	CR-SV-GT-HN-NI-US	2004	2004	1	17	0	2
Central American Free Trade Agreement (CAFTA) Dominican Republic	CR-SV-GT-HN-NI-US-DO	2004	2006	1	17	0	3
Chile US	CL-US	2003	2004	1	16	0	1
Colombia US	CO-US	2006	2012	1	17	0	1
Colombia US environmental side agreement	CO-US	2013	2013	0	0	0	1
Israel US	IL-US	1985	1985	0	0	0	0
Jordan US	JO-US	2000	2001	0	11	0	0
Korea US	KR-US	2007	2012	1	16	0	1
Korea US environmental side agreement	KR-US	2012	2012	0	0	0	0
Laos US	LA-US	2003	2005	0	14	0	0
Morocco US	MA-US	2004	2006	1	20	0	0
North American Free Trade Agreement (NAFTA)	CA-MX-US	1992	1994	0	10	0	1
Oman US	OM-US	2006	2009	1	18	0	0
Panama US	PA-US	2007	2012	1	18	0	0
Panama US environmental side agreement	PA-US	2012	2012	0	0	0	0
Peru US	PE-US	2006	2009	1	19	0	1
Singapore US	SG-US	2003	2004	1	15	0	0
Trans-Pacific Partnership (TPP)	US-MX-CA-AU-MY-CL-SG-PE-VN-NZ-BN-JP	2016	NA	1	21	0	5
US Vietnam	US-VN	2000	2001	0	14	0	1

Appendix 29: Design Regression – Index IPR Specific (sum) ~ Path Dependency (general)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	-0.121** (0.041)	-0.038 (0.036)	-0.2** (0.062)
Veto Players			
Veto players (sum)	0.015 (0.058)	0.025 (0.076)	0.032 (0.068)
Endogeneity			
PTA depth	0.354*** (0.063)	0.037 (0.04)	0.48*** (0.094)
Regime Preference			
Index IPR multilateral coherence (sum)	0.021*** (0.003)	0.012*** (0.002)	0.026*** (0.006)
Path Dependency			
Index IPR general pd (sum)	-0.012 (0.016)	0.006 (0.009)	0.011 (0.024)
Index based on binary IPR scope mentioned pl – copyrights	-0.222 (0.313)	0.057 (0.198)	-0.477 (0.41)
Index based on binary IPR scope mentioned pl – trademarks	-0.035 (0.438)	-0.991** (0.341)	0.49 (0.506)
Index based on binary IPR scope mentioned pl – geographical indications	0.582** (0.222)	0.02 (0.102)	0.853* (0.367)
Index based on binary IPR scope mentioned pl – industrial designs	1.148* (0.5)	-0.462 (0.34)	2.374*** (0.664)
Index based on binary IPR scope mentioned pl – patents	-1.206* (0.505)	1.125** (0.353)	-2.942*** (0.739)
Index based on binary IPR scope mentioned pl – undisclosed information	0.262 (0.306)	0.382* (0.192)	-0.078 (0.404)
Index based on binary IPR scope mentioned pl – layout-designs of integrated circuits	-0.414* (0.169)	-0.07 (0.099)	-0.196 (0.274)
Index based on binary IPR scope mentioned pl – new plant varieties	-0.003 (0.049)	-0.015 (0.038)	-0.051 (0.071)
Index based on binary IPR scope mentioned pl – traditional knowledge & genetic resources	0.065* (0.029)	0.069** (0.025)	-0.022 (0.06)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	-0.13* (0.06)	0.026 (0.039)	-0.157. (0.083)
Index based on binary IPR scope mentioned pl – domain names	0.105 (0.113)	-0.073 (0.048)	0.006 (0.222)
Index IPR general enforcement pd (sum)	0.033 (0.027)	-0.008 (0.016)	0.081* (0.041)
Index IPR multilateral coherence pl (dummy sum)	-0.003 (0.004)	-0.006 (0.004)	-0.008 (0.006)
Control Variables			
Democratisation (Polity 2) (mean)	-0.006 (0.025)	-0.011 (0.015)	0.012 (0.036)

Classic IP leaders	1.243*** (0.261)	0.523*** (0.119)	0.657 (0.417)
Countries with a high increase of patent protection	0.347 (0.222)	-0.095 (0.114)	0.53 (0.329)
New IP producers and developers	-0.15 (0.219)	0.113 (0.11)	-0.53 (0.347)
ln GDP (mean)	0.072 (0.079)	0.096* (0.04)	-0.06 (0.124)
ln GDPpc (mean)	0.111 (0.12)	-0.171* (0.075)	0.354. (0.186)
ln Geographic distance (mean)	0.284** (0.105)	-0.039 (0.06)	0.469*** (0.14)
Intercept	–	0.361 (1.127)	-8.338** (2.567)
Model	m6pdg1_op	m6pdg1_hp	m6pdg1_hp
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 30: Design Regression – Index IPR Specific (sum) ~ Path Dependency (specific)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure				
PTA members on Special 301 Reports (sum)	-0.072. (0.04)	-0.061. (0.037)	-0.04 (0.024)	0.186* (0.076)
Veto Players				
Veto players (sum)	0.014 (0.054)	-0.082 (0.06)	0.04 (0.036)	0.014 (0.077)
Endogeneity				
PTA depth	0.344*** (0.065)	0.359*** (0.061)	0.033 (0.037)	-0.467*** (0.087)
Regime Preference				
Index IPR multilateral coherence (sum)	0.025*** (0.003)	0.021*** (0.003)	0.011*** (0.002)	-0.022*** (0.005)
Path Dependency				
Indexes based on binary IPR scope tangible pl – copyrights	0.158 (0.153)	–	–	–
Indexes based on binary IPR scope tangible pl – trademarks	-0.26 (0.195)	–	–	–
Indexes based on binary IPR scope tangible pl – geographical indications	0.296*** (0.079)	0.059. (0.036)	-0.025 (0.021)	-0.112. (0.064)
Indexes based on binary IPR scope tangible pl – industrial designs	0.251 (0.202)	-0.081. (0.044)	-0.015 (0.021)	0.08 (0.055)
Indexes based on binary IPR scope tangible pl – patents	-0.041 (0.24)	–	–	–
Indexes based on binary IPR scope tangible pl – undisclosed information	-0.108* (0.053)	–	–	–
Indexes based on binary IPR scope tangible pl – layout-designs of integrated circuits	0.005 (0.058)	-0.053 (0.046)	-0.002 (0.017)	0.293* (0.121)
Indexes based on binary IPR scope tangible pl – new plant varieties	-0.174 (0.137)	–	–	–
Indexes based on binary IPR scope tangible pl – traditional knowledge & genetic re-sources	-0.019 (0.068)	0.044 (0.029)	0.044*** (0.013)	0.24* (0.094)
Indexes based on binary IPR scope tangible pl – encrypted program-carrying satellite signals	0.078 (0.213)	0.368* (0.147)	0.1 (0.071)	0.037 (0.223)
Indexes based on binary IPR scope tangible pl – domain names	-0.141 (0.205)	-0.337. (0.174)	-0.099 (0.085)	0.389 (0.277)
Index IPR specific enforcement pd (sum)	0.037* (0.017)	0.014 (0.011)	-0.003 (0.005)	-0.086** (0.027)
Index IPR multilateral coherence pd (sum)	-0.013** (0.005)	–	–	–
Control Variables				
Democratisation (Polity 2) (mean)	0.006 (0.024)	0.004 (0.023)	-0.003 (0.014)	-0.02 (0.031)
Classic IP leaders	1.269*** (0.273)	1.431*** (0.259)	0.506*** (0.13)	-0.667 (0.421)
Countries with a high increase of patent protection	0.284 (0.229)	0.269 (0.229)	-0.151 (0.119)	-0.638* (0.309)

New IP producers and developers	-0.178 (0.213)	-0.161 (0.208)	0.045 (0.11)	0.321 (0.296)
ln GDP (mean)	0.053 (0.082)	0.017 (0.078)	0.078. (0.04)	0.036 (0.113)
ln GDPpc (mean)	0.018 (0.117)	0.052 (0.112)	-0.169* (0.07)	-0.182 (0.161)
ln Geographic distance (mean)	0.29** (0.103)	0.284** (0.1)	-0.042 (0.056)	-0.456*** (0.128)
Intercept	–	–	0.891 (1.096)	7.265** (2.353)
Model	m6pds1_op	m6pds1.2_op	m6pds1.2_zip	m6pds1.2_zip
			Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 31: Design Regression – Index IPR Specific (sum) ~ Path Dependency (TRIPS-plus)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	-0.09* (0.039)	-0.031 (0.029)	0.256** (0.082)
Veto Players			
Veto players (sum)	-0.013 (0.051)	0.029 (0.04)	-0.024 (0.067)
Endogeneity			
PTA depth	0.366*** (0.064)	0.005 (0.039)	-0.543*** (0.098)
Regime Preference			
Index IPR multilateral coherence (sum)	0.02*** (0.003)	0.013*** (0.002)	-0.022*** (0.005)
Path Dependency			
Indexes based on binary TRIPS-plus categories pd – copyrights	0.053 (0.105)	-0.152* (0.065)	-0.523* (0.227)
Indexes based on binary TRIPS-plus categories pd – trademarks	-0.075 (0.127)	-0.039 (0.071)	-0.07 (0.224)
Indexes based on binary TRIPS-plus categories pd – geographical indications	0.059 (0.058)	-0.035 (0.052)	0.03 (0.071)
Indexes based on binary TRIPS-plus categories pd – industrial designs	-0.057 (0.128)	-0.063 (0.065)	-0.176 (0.195)
Indexes based on binary TRIPS-plus categories pd – patents	-0.035 (0.078)	0.143*** (0.035)	0.611** (0.218)
Indexes based on binary TRIPS-plus categories pd – undisclosed information	-0.001 (0.052)	0.062* (0.03)	0.047 (0.183)
Indexes based on binary TRIPS-plus categories pd – layout-designs of integrated circuits	0.39 (0.254)	0.243. (0.129)	-0.104 (0.439)
Indexes based on binary TRIPS-plus categories pd – new plant varieties	0.125 (0.133)	0.147. (0.082)	-0.207 (0.194)
Indexes based on binary TRIPS-plus categories pd – traditional knowledge & genetic resources	0.051 (0.041)	0.007 (0.015)	-0.02 (0.086)
Indexes based on binary TRIPS-plus categories pd – encrypted program-carrying satellite signals	0.18 (0.215)	-0.013 (0.127)	-0.071 (0.383)
Indexes based on binary TRIPS-plus categories pd – domain names	-0.16 (0.201)	-0.057 (0.113)	0.218 (0.313)
Indexes based on binary TRIPS-plus categories pd – enforcement	-0.038 (0.053)	-0.075* (0.036)	-0.057 (0.063)
Indexes based on binary TRIPS-plus categories pd – exhaustion	-0.037 (0.061)	-0.008 (0.019)	0.265 (0.233)
Control Variables			
Democratisation (Polity 2) (mean)	0.004 (0.024)	0.004 (0.014)	-0.005 (0.033)
Classic IP leaders	1.213*** (0.27)	0.45** (0.141)	-0.858* (0.433)

Countries with a high increase of patent protection	0.23 (0.227)	-0.11 (0.118)	-0.742* (0.323)
New IP producers and developers	-0.144 (0.211)	0.065 (0.115)	0.252 (0.309)
ln GDP (mean)	0.01 (0.081)	0.038 (0.045)	0.129 (0.121)
ln GDPpc (mean)	0.068 (0.115)	-0.142* (0.07)	-0.255 (0.173)
ln Geographic distance (mean)	0.295** (0.101)	-0.067 (0.059)	-0.444*** (0.134)
Intercept	–	1.88 (1.24)	5.714* (2.402)
Model	m6pdtp1_op	m6pdtp1_zip	m6pdtp1_zip
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 32: Design Regression – Index IPR Specific (sum) ~ Path Dependency (world, signature, specific)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	0 (0)	-0.015 (0.022)	-0.013 (1618)
Veto Players			
Veto players (sum)	0 (0)	-0.012 (0.011)	0.004 (1680)
Endogeneity			
PTA depth	0 (0)	-0.041 (0.046)	0.1 (2577)
Regime Preference			
Index IPR multilateral coherence (sum)	0 (0)	-0.006 (0.007)	-0.011 (1130)
Path Dependency			
Indexes based on binary IPR scope tangible pdw s – copyrights	1 (0)***	0.181 (0.155)	12.81 (17940)
Indexes based on binary IPR scope tangible pdw s – trademarks	1 (0)***	0.362 (0.175)*	-0.705 (32420)
Indexes based on binary IPR scope tangible pdw s – geographical indications	1 (0)***	0.092 (0.111)	13.58 (24620)
Indexes based on binary IPR scope tangible pdw s – industrial designs	1 (0)***	0.04 (0.139)	-26.2 (54690)
Indexes based on binary IPR scope tangible pdw s – patents	1 (0)***	0.146 (0.139)	13.6 (40890)
Indexes based on binary IPR scope tangible pdw s – undisclosed information	1 (0)***	0.112 (0.113)	0.646 (38780)
Indexes based on binary IPR scope tangible pdw s – layout-designs of integrated circuits	1 (0)***	0.221 (0.191)	1.078 (611400)
Indexes based on binary IPR scope tangible pdw s – new plant varieties	1 (0)***	0.253 (0.128)*	-38.77 (498700)
Indexes based on binary IPR scope tangible pdw s – traditional knowledge & genetic resources	1 (0)***	0.23 (0.149)	-0.206 (493900)
Indexes based on binary IPR scope tangible pdw s – encrypted program-carrying satellite signals	1 (0)***	0.258 (0.144).	-39.67 (616000)
Indexes based on binary IPR scope tangible pdw s – domain names	1 (0)***	-0.243 (0.211)	-38.61 (454300)
Index IPR specific enforcement pdw s (sum)	1 (0)***	0.212 (0.04)***	13.05 (6022)
Index IPR multilateral coherence pdw s (sum)	0 (0)	0.04 (0.036)	0.056 (5205)
Control Variables			
Democratisation (Polity 2) (mean)	0 (0)	0.011 (0.016)	-0.005 (683.7)
Classic IP leaders	0 (0)	0.099 (0.143)	-0.021 (15540)

Countries with a high increase of patent protection	0 (0)	0.007 (0.134)	0.126 (10270)
New IP producers and developers	0 (0)	0.02 (0.114)	-0.074 (9437)
ln GDP (mean)	0 (0)	-0.054 (0.051)	-0.038 (2572)
ln GDPpc (mean)	0 (0)	0.003 (0.072)	0.052 (4296)
ln Geographic distance (mean)	0 (0)	-0.059 (0.064)	0.005 (4007)
Intercept	–	2.217 (1.287).	-6.612 (58570)
Model	m6pdwss1_ols	m6pdwss1_hp	m6pdwss1_hp
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 33: Design Regression – Index IPR Specific (sum) ~ Path Dependency (world, force, specific)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	0 (0)	-0.012 (0.022)	-0.007 (1875)
Veto Players			
Veto players (sum)	0 (0)	-0.011 (0.011)	0.003 (1991)
Endogeneity			
PTA depth	0 (0)	-0.042 (0.047)	0.095 (2974)
Regime Preference			
Index IPR multilateral coherence (sum)	0* (0)	-0.005 (0.008)	-0.012 (1221)
Path Dependency			
Indexes based on binary IPR scope tangible pdw f – copyrights	1*** (0)	0.198 (0.156)	12.89 (20970)
Indexes based on binary IPR scope tangible pdw f – trademarks	1*** (0)	0.359* (0.178)	-0.623 (30950)
Indexes based on binary IPR scope tangible pdw f – geographical indications	1*** (0)	0.091 (0.114)	13.52 (20500)
Indexes based on binary IPR scope tangible pdw f – industrial designs	1*** (0)	0.041 (0.139)	-26.42 (62860)
Indexes based on binary IPR scope tangible pdw f – patents	1*** (0)	0.136 (0.139)	13.74 (44600)
Indexes based on binary IPR scope tangible pdw f – undisclosed information	1*** (0)	0.139 (0.117)	0.446 (34210)
Indexes based on binary IPR scope tangible pdw f – layout-designs of integrated circuits	1*** (0)	0.192 (0.195)	0.238 (1605000)
Indexes based on binary IPR scope tangible pdw f – new plant varieties	1*** (0)	0.224. (0.133)	-27.07 (2178000)
Indexes based on binary IPR scope tangible pdw f – traditional knowledge & genetic resources	1*** (0)	0.224 (0.156)	-11.82 (2155000)
Indexes based on binary IPR scope tangible pdw f – encrypted program-carrying satellite signals	1*** (0)	0.258. (0.145)	-38.78 (1588000)
Indexes based on binary IPR scope tangible pdw f – domain names	1*** (0)	-0.203 (0.227)	-39.49 (490400)
Index IPR specific enforcement pdw f (sum)	1*** (0)	0.213*** (0.04)	13.15 (7228)
Index IPR multilateral coherence pdw f (sum)	0* (0)	0.035 (0.04)	0.062 (5646)
Control Variables			
Democratisation (Polity 2) (mean)	0 (0)	0.008 (0.016)	-0.006 (823.4)
Classic IP leaders	0 (0)	0.154 (0.171)	-0.079 (17760)

Countries with a high increase of patent protection	0 (0)	0.059 (0.155)	0.088 (12320)
New IP producers and developers	0 (0)	0.059 (0.124)	-0.077 (11260)
ln GDP (mean)	0 (0)	-0.065 (0.052)	-0.035 (3047)
ln GDPpc (mean)	0 (0)	0.007 (0.073)	0.051 (5135)
ln Geographic distance (mean)	0 (0)	-0.054 (0.066)	0.011 (4679)
Intercept	–	2.393. (1.316)	-6.735 (68240)
Model	m6pdwfs1_ols	m6pdwfs1_hp	m6pdwfs1_hp
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	484	484	484

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 34: Design Regression – Index IPR Specific (sum) ~ Path Dependency (world, force, TRIPS-plus)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	-0.03 (0.031)	-0.02 (0.019)	-0.038 (0.071)
Veto Players			
Veto players (sum)	-0.059. (0.033)	-0.012 (0.012)	-0.009 (0.081)
Endogeneity			
PTA depth	0.295*** (0.073)	0.042 (0.041)	0.413*** (0.121)
Regime Preference			
Index IPR multilateral coherence (sum)	0.003 (0.005)	0.001 (0.002)	0.002 (0.011)
Path Dependency			
Indexes based on binary TRIPS-plus categories pdw f – copyrights	-0.685 (0.716)	0.027 (0.239)	-4.144 (704)
Indexes based on binary TRIPS-plus categories pdw f – geographical indications	0.645 (0.553)	0.022 (0.215)	0.971 (6863)
Indexes based on binary TRIPS-plus categories pdw f – industrial designs	2.386*** (0.304)	1.295*** (0.333)	8.011 (1194)
Indexes based on binary TRIPS-plus categories pdw f – patents	0.738. (0.405)	0.161 (0.153)	0.529 (6581)
Indexes based on binary TRIPS-plus categories pdw f – undisclosed information	1.286** (0.421)	0.553*** (0.152)	-0.542 (2624)
Indexes based on binary TRIPS-plus categories pdw f – new plant varieties	1.305*** (0.341)	0.335** (0.124)	0.516 (1495)
Indexes based on binary TRIPS-plus categories pdw f – traditional knowledge & genetic resources	0.195 (0.392)	0.007 (0.147)	1.838 (3199)
Indexes based on binary TRIPS-plus categories pdw f – encrypted program-carrying satellite signals	0.67. (0.379)	-0.116 (0.138)	0.287 (7823)
Indexes based on binary TRIPS-plus categories pdw f – domain names	-0.249 (0.912)	-0.233 (0.286)	-2.023 (6686)
Indexes based on binary TRIPS-plus categories pdw f – enforcement	0.247 (0.308)	0.094 (0.127)	-0.451 (2302)
Indexes based on binary TRIPS-plus categories pdw f – exhaustion	0.339 (0.352)	0.109 (0.132)	-1.187 (2428)
Control Variables			
Democratisation (Polity 2) (mean)	0.016 (0.027)	0.01 (0.016)	0.021 (0.039)
Classic IP leaders	1.071*** (0.318)	0.503** (0.163)	0.03 (0.664)
Countries with a high increase of patent protection	-0.126 (0.291)	-0.024 (0.151)	0.459 (0.398)
New IP producers and developers	-0.043 (0.235)	0.051 (0.114)	0.001 (0.373)

ln GDP (mean)	0.146 (0.1)	0.059 (0.052)	-0.183 (0.165)
ln GDPpc (mean)	-0.142 (0.137)	-0.125. (0.067)	0.254 (0.25)
ln Geographic distance (mean)	0.348** (0.123)	0.017 (0.064)	0.489* (0.209)
Intercept	–	-0.895 (1.436)	-4.416 (3.07)
Model	m6pdwftp1_op	m6pdwftp1_hp	m6pdwftp1_hp
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	484	484	484

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 35: Design Regression – Index IPR Scope Tangible (sum) ~ Economic Power Asymmetry

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Economic Power Asymmetry			
GDP asymmetry (max/sum)	4.067 (8.808)	-26.232 (90.189)	7.531 (15.515)
GDPpc asymmetry (max/sum)	-4.122 (10.555)	32.396 (91.02)	-11.118 (16.865)
GDP asymmetry * substantial tariff cuts	2.156 (2.079)	26.668 (89.647)	-1.34 (2.976)
GDPpc asymmetry * substantial tariff cuts	-3.16 (2.361)	-28.361 (90.337)	1.392 (3.966)
GDP asymmetry * ln FDI	-0.129 (0.249)	-0.107 (0.384)	0.231 (0.521)
GDPpc asymmetry * ln FDI	0.08 (0.287)	-0.023 (0.425)	-0.251 (0.537)
GDP asymmetry * lnofficial development assistance and official aid received	-0.072 (0.376)	0.045 (0.328)	-0.463 (0.642)
GDPpc asymmetry * lnofficial develop-ment assistance and official aid received	0.198 (0.469)	-0.165 (0.418)	0.692 (0.784)
GDP asymmetry * (DAC aid received by PTA members/ DAC aid received)	0.552 (6.044)	6.042 (6.249)	-0.697 (23.137)
GDPpc asymmetry * (DAC aid received by PTA members/ DAC aid received)	-3.716 (8.14)	-6.842 (7.326)	-6.35 (36.382)
Political Pressure			
PTA members on Special 301 Reports (sum)	0.076. (0.039)	0.071* (0.028)	0.072 (0.074)
Veto Players			
Veto players (sum)	-0.022 (0.038)	-0.085* (0.041)	0.002 (0.1)
Endogeneity			
PTA depth	0.497*** (0.093)	0.256** (0.08)	0.491** (0.19)
Index IPR specific enforcement (sum)	0.69*** (0.087)	0.311*** (0.062)	1.184*** (0.275)
Regime Preference			
Index IPR multilateral coherence (sum)	0.009. (0.005)	0.004 (0.005)	0.03** (0.011)
Control Variables			
Democratisation (Polity 2) (mean)	-0.009 (0.035)	-0.056 (0.036)	0.062 (0.082)
Classic IP leaders	0.479 (0.388)	0.184 (0.364)	0.599 (0.788)
Countries with a high increase of patent protection	0.568. (0.308)	0.277 (0.384)	0.024 (0.631)
New IP producers and developers	-0.8* (0.34)	-0.24 (0.302)	-0.972 (0.609)
ln GDP (mean)	-0.289. (0.16)	0.075 (0.182)	-0.789* (0.394)

ln GDPpc (mean)	0.354. (0.204)	-0.153 (0.263)	0.637 (0.468)
ln Geographic distance (mean)	0.685*** (0.185)	-0.213 (0.177)	1.951*** (0.55)
Intercept	–	0.955 (6.076)	-6.317 (6.722)
Model	m7epa3_op	m7epa3_hp	m7epa3_hp
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	392	392	392

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 36: Design Regression – Index IPR Scope Tangible (sum) ~ Path Dependency (general)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	0.03 (0.049)	0.044 (0.054)	-0.051 (0.1)
Veto Players			
Veto players (sum)	-0.09 (0.089)	0.009 (0.146)	-0.079 (0.166)
Endogeneity			
PTA depth	0.394*** (0.073)	0.165* (0.07)	0.163 (0.127)
Index IPR specific enforcement (sum)	0.689*** (0.072)	0.245*** (0.053)	0.88*** (0.145)
Regime Preference			
Index IPR multilateral coherence (sum)	0.004 (0.004)	0.003 (0.004)	0.021* (0.008)
Path Dependency			
Index IPR general pd (sum)	0.017 (0.017)	0.006 (0.013)	0.057 (0.036)
Index based on binary IPR scope mentioned pl – copyrights	0.064 (0.328)	-0.033 (0.277)	0.157 (0.552)
Index based on binary IPR scope mentioned pl – trademarks	-0.284 (0.507)	-0.781 (0.525)	-0.409 (0.852)
Index based on binary IPR scope mentioned pl – geographical indications	0.094 (0.222)	-0.086 (0.135)	0.758 (0.534)
Index based on binary IPR scope mentioned pl – industrial designs	0.48 (0.555)	-0.157 (0.49)	2.237* (0.933)
Index based on binary IPR scope mentioned pl – patents	-0.58 (0.584)	0.672 (0.594)	-2.374* (0.951)
Index based on binary IPR scope mentioned pl – undisclosed information	0.082 (0.344)	0.323 (0.311)	-0.312 (0.588)
Index based on binary IPR scope mentioned pl – layout-designs of integrated circuits	0.164 (0.186)	0.077 (0.14)	-0.228 (0.354)
Index based on binary IPR scope mentioned pl – new plant varieties	0.03 (0.053)	0.032 (0.064)	0.08 (0.096)
Index based on binary IPR scope mentioned pl – traditional knowledge & genetic resources	-0.046 (0.033)	0.046 (0.067)	-0.154. (0.092)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	-0.064 (0.064)	0.013 (0.064)	-0.027 (0.128)
Index based on binary IPR scope mentioned pl – domain names	0.075 (0.121)	-0.048 (0.072)	0.547. (0.281)
Index IPR general enforcement pd (sum)	0.002 (0.029)	0 (0.023)	-0.008 (0.056)
Index IPR multilateral coherence pl (dummy sum)	-0.001 (0.004)	-0.006 (0.009)	-0.002 (0.008)

Control Variables			
Democratisation (Polity 2) (mean)	-0.006 (0.028)	-0.033 (0.023)	0.046 (0.06)
Classic IP leaders	0.309 (0.294)	0.203 (0.182)	-0.029 (0.633)
Countries with a high increase of patent protection	0.25 (0.251)	-0.049 (0.169)	-0.49 (0.548)
New IP producers and developers	-0.478. (0.246)	-0.154 (0.174)	-0.585 (0.422)
ln GDP (mean)	-0.076 (0.088)	0.004 (0.067)	0.064 (0.222)
ln GDPpc (mean)	-0.128 (0.131)	-0.283* (0.112)	0.27 (0.304)
ln Geographic distance (mean)	0.323** (0.116)	-0.014 (0.097)	0.516** (0.181)
Intercept	–	2.252 (1.851)	-11.345* (4.942)
Model	m7pdg3_op	m7pdg3_hp	m7pdg3_hp
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 37: Design Regression – Index IPR Scope Tangible (sum) ~ Path Dependency (specific)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure				
PTA members on Special 301 Reports (sum)	0.103. (0.053)	0.107* (0.051)	0.062 (0.084)	0.013 (0.09)
Veto Players				
Veto players (sum)	-0.122 (0.097)	-0.134 (0.095)	-0.04 (0.205)	-0.123 (0.157)
Endogeneity				
PTA depth	0.391*** (0.075)	0.39*** (0.071)	0.174** (0.066)	0.167 (0.118)
Index IPR specific enforcement (sum)	0.687*** (0.074)	0.695*** (0.073)	0.269*** (0.08)	0.87*** (0.15)
Regime Preference				
Index IPR multilateral coherence (sum)	0.005 (0.004)	0.004 (0.004)	0 (0.004)	0.022** (0.008)
Path Dependency				
Indexes based on binary IPR scope tangible pl – copyrights	0.018 (0.166)	-0.158. (0.086)	-0.058 (0.053)	-0.277 (0.306)
Indexes based on binary IPR scope tangible pl – trademarks	-0.414. (0.227)	–	–	–
Indexes based on binary IPR scope tangible pl – geographical indications	0.152. (0.083)	0.062 (0.055)	-0.01 (0.086)	0.177 (0.108)
Indexes based on binary IPR scope tangible pl – industrial designs	-0.176 (0.224)	–	–	–
Indexes based on binary IPR scope tangible pl – patents	0.369 (0.268)	–	–	–
Indexes based on binary IPR scope tangible pl – undisclosed information	-0.088. (0.051)	-0.088. (0.048)	-0.014 (0.032)	-0.024 (0.062)
Indexes based on binary IPR scope tangible pl – layout-designs of integrated circuits	0.087 (0.06)	0.083 (0.057)	0.028 (0.026)	-0.132 (0.249)
Indexes based on binary IPR scope tangible pl – new plant varieties	0.058 (0.152)	–	–	–
Indexes based on binary IPR scope tangible pl – traditional knowledge & genetic resources	-0.052 (0.073)	0.011 (0.039)	0.026 (0.025)	-0.061 (0.148)
Indexes based on binary IPR scope tangible pl – encrypted program-carrying satellite signals	0.407. (0.226)	0.318. (0.166)	0.03 (0.118)	0.063 (0.303)
Indexes based on binary IPR scope tangible pl – domain names	-0.345 (0.219)	-0.231 (0.192)	-0.028 (0.146)	0.019 (0.317)
Index IPR specific enforcement pd (sum)	0.01 (0.018)	0.011 (0.017)	-0.006 (0.014)	0.153** (0.057)
Index IPR multilateral coherence pd (sum)	0.002 (0.005)	0.003 (0.005)	0.003 (0.011)	-0.02. (0.011)
Control Variables				
Democratisation (Polity 2) (mean)	-0.005 (0.026)	-0.006 (0.026)	-0.035 (0.022)	0.042 (0.05)

Classic IP leaders	0.455 (0.303)	0.525. (0.298)	0.225 (0.197)	0.475 (0.631)
Countries with a high increase of patent protection	0.216 (0.255)	0.276 (0.252)	0.044 (0.173)	-0.164 (0.512)
New IP producers and developers	-0.448. (0.253)	-0.454. (0.246)	-0.084 (0.174)	-0.466 (0.382)
ln GDP (mean)	-0.139 (0.089)	-0.176* (0.086)	-0.049 (0.073)	-0.154 (0.179)
ln GDPpc (mean)	-0.042 (0.128)	0.012 (0.123)	-0.185. (0.099)	0.251 (0.261)
ln Geographic distance (mean)	0.345** (0.116)	0.336** (0.113)	-0.031 (0.089)	0.647*** (0.181)
Intercept	–	–	2.943 (2.106)	-6.55. (3.762)
Model	m7pds3_op	m7pds3.2_op	m7pds3.2_hp Count Data (Stage 2)	m7pds3.2_hp Zero Data (Stage 1)
Observations	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 38: Design Regression – Index IPR Scope Tangible (sum) ~ Path Dependency (TRIPS-plus)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	0.069 (0.046)	0.071 (0.046)	0.032 (0.078)
Veto Players			
Veto players (sum)	-0.075 (0.07)	0.033 (0.057)	-0.257 (0.225)
Endogeneity			
PTA depth	0.397*** (0.074)	0.144* (0.065)	0.257* (0.127)
Index IPR specific enforcement (sum)	0.685*** (0.071)	0.219*** (0.047)	0.942*** (0.153)
Regime Preference			
Index IPR multilateral coherence (sum)	0.006 (0.004)	0.005 (0.004)	0.017* (0.007)
Path Dependency			
Indexes based on binary TRIPS-plus categories pd – copyrights	-0.225. (0.118)	-0.193. (0.1)	0.032 (0.265)
Indexes based on binary TRIPS-plus categories pd – trademarks	-0.092 (0.145)	0.12 (0.111)	-0.135 (0.296)
Indexes based on binary TRIPS-plus categories pd – geographical indications	0.022 (0.061)	-0.037 (0.08)	-0.072 (0.076)
Indexes based on binary TRIPS-plus categories pd – industrial designs	0.002 (0.147)	-0.166 (0.103)	0.489. (0.26)
Indexes based on binary TRIPS-plus categories pd – patents	0.13 (0.085)	0.165* (0.07)	-0.182 (0.176)
Indexes based on binary TRIPS-plus categories pd – undisclosed information	0.04 (0.057)	0.075 (0.046)	-0.025 (0.143)
Indexes based on binary TRIPS-plus categories pd – layout-designs of integrated circuits	0.297 (0.282)	0.382* (0.192)	-0.66 (0.518)
Indexes based on binary TRIPS-plus categories pd – new plant varieties	0.179 (0.149)	0.064 (0.123)	-0.03 (0.286)
Indexes based on binary TRIPS-plus categories pd – traditional knowledge & genetic resources	-0.033 (0.044)	0 (0.022)	0.04 (0.11)
Indexes based on binary TRIPS-plus categories pd – encrypted program-carrying satellite signals	0.06 (0.245)	-0.274 (0.185)	0.72. (0.399)
Indexes based on binary TRIPS-plus categories pd – domain names	-0.06 (0.222)	0.116 (0.161)	-0.185 (0.385)
Indexes based on binary TRIPS-plus categories pd – enforcement	-0.009 (0.056)	-0.062 (0.068)	0.113 (0.088)
Indexes based on binary TRIPS-plus categories pd – exhaustion	-0.001 (0.064)	-0.015 (0.029)	-0.092 (0.234)
Control Variables			
Democratisation (Polity 2) (mean)	0 (0.026)	-0.037. (0.021)	0.033 (0.052)

Classic IP leaders	0.298 (0.303)	0.25 (0.211)	0.6 (0.629)
Countries with a high increase of patent protection	0.253 (0.252)	0.078 (0.171)	-0.162 (0.512)
New IP producers and developers	-0.575* (0.251)	-0.021 (0.184)	-0.542 (0.416)
ln GDP (mean)	-0.163. (0.091)	-0.075 (0.073)	-0.182 (0.189)
ln GDPpc (mean)	-0.034 (0.128)	-0.161 (0.102)	0.302 (0.271)
ln Geographic distance (mean)	0.355** (0.116)	-0.09 (0.094)	0.646*** (0.182)
Intercept	–	3.941* (1.894)	-6.389. (3.847)
Model	m7pdtp3_op	m7pdtp3_hp Count Data (Stage 2)	m7pdtp3_hp Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 39: Design Regression – Index IPR Scope Tangible (sum) ~ Path Dependency (world, signature, specific)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	0 (0)	-0.006 (0.03)	0.007 (2330)
Veto Players			
Veto players (sum)	0 (0)	-0.009 (0.015)	-0.027 (2911)
Endogeneity			
PTA depth	0 (0)	-0.016 (0.078)	0.009 (4129)
Index IPR enforcement (sum)	0 (0)	0.055 (0.074)	0.049 (6765)
Regime Preference			
Index IPR multilateral coherence (sum)	0* (0)	-0.002 (0.011)	0.005 (1596)
Path Dependency			
Indexes based on binary IPR scope tangible pdw s – copyrights	1*** (0)	0.345 (0.256)	13.39 (34210)
Indexes based on binary IPR scope tangible pdw s – trademarks	1*** (0)	0.576. (0.296)	11.87 (69480)
Indexes based on binary IPR scope tangible pdw s – geographical indications	1*** (0)	0.217 (0.181)	13.5 (15130)
Indexes based on binary IPR scope tangible pdw s – industrial designs	1*** (0)	0.084 (0.202)	12.7 (36190)
Indexes based on binary IPR scope tangible pdw s – patents	1*** (0)	0.396. (0.217)	0.996 (63230)
Indexes based on binary IPR scope tangible pdw s – undisclosed information	1*** (0)	0.31. (0.178)	-0.117 (36810)
Indexes based on binary IPR scope tangible pdw s – layout-designs of integrated circuits	1*** (0)	0.284 (0.266)	0.082 (181100)
Indexes based on binary IPR scope tangible pdw s – new plant varieties	1*** (0)	0.396* (0.189)	-13.23 (152500)
Indexes based on binary IPR scope tangible pdw s – traditional knowledge & genetic resources	1*** (0)	0.299 (0.226)	0.043 (41590)
Indexes based on binary IPR scope tangible pdw s – encrypted program-carrying satellite signals	1*** (0)	0.424. (0.221)	-12.32 (87720)
Indexes based on binary IPR scope tangible pdw s – domain names	1*** (0)	-0.183 (0.317)	-13.48 (139900)
Index IPR specific enforcement pdw s (sum)	0 (0)	-0.001 (0.097)	0.056 (11160)
Index IPR multilateral coherence pdw s (sum)	0* (0)	0.026 (0.057)	-0.011 (7542)
Control Variables			
Democratisation (Polity 2) (mean)	0 (0)	0.004 (0.025)	0.016 (1663)

Classic IP leaders	0 (0)	0.048 (0.215)	0.273 (20600)
Countries with a high increase of patent protection	0 (0)	-0.155 (0.204)	0.142 (15920)
New IP producers and developers	0 (0)	0.044 (0.18)	-0.04 (14590)
ln GDP (mean)	0 (0)	-0.036 (0.08)	-0.065 (5458)
ln GDPpc (mean)	0 (0)	-0.022 (0.109)	0.078 (8687)
ln Geographic distance (mean)	0 (0)	-0.096 (0.099)	0.058 (6944)
Intercept	0. (0)	1.249 (2.027)	-6.683 (102300)
Model	m7pdwss1_ols	m7pdwss1_hp	m7pdwss1_hp
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 40: Design Regression – Index IPR Scope Tangible (sum) ~ Path Dependency (world, signature, TRIPS-plus)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	0.099** (0.037)	0.05. (0.026)	0.609 (0.559)
Veto Players			
Veto players (sum)	-0.083* (0.034)	-0.034* (0.017)	-0.674 (0.779)
Endogeneity			
PTA depth	0.283** (0.092)	0.128. (0.066)	0.317 (0.302)
Index IPR specific enforcement (sum)	0.316*** (0.096)	0.146** (0.056)	0.135 (0.35)
Regime Preference			
Index IPR multilateral coherence (sum)	-0.007 (0.006)	-0.003 (0.004)	0.013 (0.022)
Path Dependency			
Indexes based on binary TRIPS-plus categories pdw s – copyrights	-0.276 (0.811)	0.108 (0.342)	-2.908 (3189)
Indexes based on binary TRIPS-plus categories pdw s – geographical indications	0.156 (0.548)	-0.138 (0.258)	3.439 (7043)
Indexes based on binary TRIPS-plus categories pdw s – industrial designs	2.752*** (0.458)	0.701 (0.73)	3.476* (1.725)
Indexes based on binary TRIPS-plus categories pdw s – patents	0.082 (0.389)	0.048 (0.216)	4.007 (2881)
Indexes based on binary TRIPS-plus categories pdw s – undisclosed information	1.588*** (0.444)	0.588* (0.25)	3.43 (1843)
Indexes based on binary TRIPS-plus categories pdw s – layout-designs of integrated circuits	0.16 (0.303)	0.116 (0.178)	12.24 (10240)
Indexes based on binary TRIPS-plus categories pdw s – new plant varieties	0.734. (0.391)	0.183 (0.199)	3.912 (10100)
Indexes based on binary TRIPS-plus categories pdw s – traditional knowledge & genetic resources	-0.165 (0.403)	-0.077 (0.215)	-3.726 (11410)
Indexes based on binary TRIPS-plus categories pdw s – encrypted program-carrying satellite signals	0.813* (0.396)	-0.026 (0.214)	-0.066 (10750)
Indexes based on binary TRIPS-plus categories pdw s – domain names	1.721. (0.968)	0.186 (0.422)	-4.783 (27410)
Indexes based on binary TRIPS-plus categories pdw s – enforcement	0.283 (0.326)	0.231 (0.196)	4.268 (1630)
Indexes based on binary TRIPS-plus categories pdw s – exhaustion	1.307*** (0.374)	0.344. (0.19)	3.189 (2441)
Control Variables			
Democratisation (Polity 2) (mean)	0.019 (0.037)	-0.007 (0.023)	0.152 (0.143)
Classic IP leaders	0.877* (0.373)	0.265 (0.206)	1.1 (1.483)

Countries with a high increase of patent protection	-0.168 (0.346)	-0.136 (0.211)	-0.054 (0.906)
New IP producers and developers	-0.22 (0.282)	-0.078 (0.156)	0.617 (0.865)
ln GDP (mean)	0.113 (0.129)	0.035 (0.081)	-0.038 (0.592)
ln GDPpc (mean)	-0.22 (0.176)	-0.159 (0.108)	-0.005 (0.771)
ln Geographic distance (mean)	0.438** (0.144)	0.002 (0.095)	2.555** (0.92)
Intercept	–	-0.574 (2.095)	-25.95 (19.31)
Model	m7pdwstp3_op	m7pdwstp3_hp	m7pdwstp3_hp
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 41: Design Regression – Index IPR Scope Tangible (sum) ~ Path Dependency (world, force, specific)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	0 (0)	-0.002 (0.031)	0.007 (2426)
Veto Players			
Veto players (sum)	0 (0)	-0.007 (0.015)	-0.019 (3061)
Endogeneity			
PTA depth	0 (0)	-0.019 (0.08)	0.016 (4129)
Index IPR enforcement (sum)	0 (0)	0.073 (0.079)	0.047 (6736)
Regime Preference			
Index IPR multilateral coherence (sum)	0 (0)	-0.001 (0.012)	0.002 (1636)
Path Dependency			
Indexes based on binary IPR scope tangible pdw f – copyrights	1*** (0)	0.359 (0.257)	13.42 (39210)
Indexes based on binary IPR scope tangible pdw f – trademarks	1*** (0)	0.56. (0.301)	11.96 (66230)
Indexes based on binary IPR scope tangible pdw f – geographical indications	1*** (0)	0.217 (0.188)	13.51 (15830)
Indexes based on binary IPR scope tangible pdw f – industrial designs	1*** (0)	0.096 (0.202)	12.73 (37600)
Indexes based on binary IPR scope tangible pdw f – patents	1*** (0)	0.383. (0.217)	0.935 (58020)
Indexes based on binary IPR scope tangible pdw f – undisclosed information	1*** (0)	0.34. (0.182)	-0.107 (41730)
Indexes based on binary IPR scope tangible pdw f – layout-designs of integrated circuits	1*** (0)	0.257 (0.275)	0.223 (181200)
Indexes based on binary IPR scope tangible pdw f – new plant varieties	1*** (0)	0.364. (0.197)	-13.39 (151000)
Indexes based on binary IPR scope tangible pdw f – traditional knowledge & genetic resources	1*** (0)	0.287 (0.235)	0.131 (52840)
Indexes based on binary IPR scope tangible pdw f – encrypted program-carrying satellite signals	1*** (0)	0.428. (0.222)	-12.43 (88510)
Indexes based on binary IPR scope tangible pdw f – domain names	1*** (0)	-0.154 (0.339)	-13.44 (139500)
Index IPR specific enforcement pdw f (sum)	0 (0)	-0.018 (0.101)	0.053 (11360)
Index IPR multilateral coherence pdw f (sum)	0 (0)	0.019 (0.064)	-0.002 (7735)
Control Variables			
Democratisation (Polity 2) (mean)	0 (0)	-0.001 (0.025)	0 (1454)

Classic IP leaders	0 (0)	0.12 (0.268)	0.259 (22100)
Countries with a high increase of patent protection	0 (0)	-0.099 (0.238)	0.149 (15540)
New IP producers and developers	0 (0)	0.081 (0.194)	-0.056 (14810)
ln GDP (mean)	0 (0)	-0.054 (0.084)	-0.067 (5529)
ln GDPpc (mean)	0 (0)	-0.018 (0.111)	0.084 (8816)
ln Geographic distance (mean)	0 (0)	-0.096 (0.102)	0.064 (7103)
Intercept	0 (0)	1.607 (2.109)	-6.664 (103600)
Model	m7pdwfs1_ols	m7pdwfs1_hp	m7pdwfs1_hp
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	484	484	484

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 42: Design Regression – Index IPR Specific Enforcement (sum) ~ Path Dependency (general)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	-0.148*** (0.043)	-0.008 (0.066)	0.284** (0.089)
Veto Players			
Veto players (sum)	0.044 (0.063)	0.112 (0.173)	-0.015 (0.08)
Endogeneity			
PTA depth	0.243*** (0.067)	0.03 (0.09)	-0.358** (0.117)
Regime Preference			
Index IPR multilateral coherence (sum)	0.026*** (0.004)	0.005 (0.005)	-0.036** (0.012)
Path Dependency			
Index IPR general pd (sum)	-0.022 (0.017)	0.016 (0.013)	-0.017 (0.034)
Index based on binary IPR scope mentioned pl – copyrights	-0.403 (0.317)	0.196 (0.307)	1.022. (0.619)
Index based on binary IPR scope mentioned pl – trademarks	-0.092 (0.415)	-0.79. (0.455)	-0.715 (0.987)
Index based on binary IPR scope mentioned pl – geographical indications	0.781*** (0.23)	0.109 (0.156)	-0.81. (0.453)
Index based on binary IPR scope mentioned pl – industrial designs	1.142* (0.516)	-0.968 (0.777)	-2.333** (0.849)
Index based on binary IPR scope mentioned pl – patents	-0.937. (0.542)	1.29 (0.857)	2.372* (0.978)
Index based on binary IPR scope mentioned pl – undisclosed information	0.308 (0.3)	0.225 (0.298)	-0.068 (0.643)
Index based on binary IPR scope mentioned pl – layout-designs of integrated circuits	-0.661*** (0.179)	-0.158 (0.152)	0.449 (0.414)
Index based on binary IPR scope mentioned pl – new plant varieties	-0.036 (0.056)	0.054 (0.158)	0.268. (0.157)
Index based on binary IPR scope mentioned pl – traditional knowledge & genetic resources	0.099** (0.031)	0.06 (0.079)	0.018 (0.091)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	-0.131* (0.064)	0.106 (0.116)	0.359* (0.172)
Index based on binary IPR scope mentioned pl – domain names	0.01 (0.117)	-0.054 (0.076)	0.346 (0.339)
Index IPR general enforcement pd (sum)	0.035 (0.029)	-0.031 (0.023)	-0.17* (0.079)
Index IPR multilateral coherence pl (dummy sum)	-0.002 (0.004)	-0.006 (0.014)	0.007 (0.008)
Control Variables			
Democratisation (Polity 2) (mean)	0.005 (0.027)	0.014 (0.033)	0.016 (0.043)

Classic IP leaders	1.09*** (0.265)	0.174 (0.176)	-0.83 (0.537)
Countries with a high increase of patent protection	0.235 (0.237)	0.012 (0.242)	-0.748. (0.395)
New IP producers and developers	0.086 (0.232)	0.065 (0.167)	0.253 (0.4)
ln GDP (mean)	0.142. (0.084)	0.146* (0.061)	0.073 (0.145)
ln GDPpc (mean)	0.213. (0.127)	0.256 (0.156)	-0.155 (0.221)
ln Geographic distance (mean)	0.155 (0.11)	0.021 (0.107)	-0.269. (0.159)
Intercept	–	-6.06* (2.502)	4.448 (3.372)
Model	m9pdg1_op	m9pdg1_zip	m9pdg1_zip
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 43: Design Regression – Index IPR Specific Enforcement (sum) ~ Path Dependency (specific)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure				
PTA members on Special 301 Reports (sum)	-0.13** (0.044)	-0.1* (0.04)	-0.084 (0.078)	-0.103* (0.05)
Veto Players				
Veto players (sum)	0.057 (0.055)	0.039 (0.054)	0.115 (0.208)	0.037 (0.06)
Endogeneity				
PTA depth	0.223** (0.07)	0.201** (0.066)	0 (0.081)	0.286*** (0.081)
Regime Preference				
Index IPR multilateral coherence (sum)	0.03*** (0.004)	0.029*** (0.004)	0.007* (0.003)	0.029*** (0.005)
Path Dependency				
Indexes based on binary IPR scope tangible pl – copyrights	0.146 (0.162)	–	–	–
Indexes based on binary IPR scope tangible pl – trademarks	-0.224 (0.209)	–	–	–
Indexes based on binary IPR scope tangible pl – geographical indications	0.406*** (0.122)	0.315*** (0.091)	-0.018 (0.12)	0.31** (0.109)
Indexes based on binary IPR scope tangible pl – industrial designs	0.286 (0.217)	-0.149 (0.094)	-0.009 (0.039)	-0.059 (0.079)
Indexes based on binary IPR scope tangible pl – patents	0.031 (0.257)	–	–	–
Indexes based on binary IPR scope tangible pl – undisclosed information	-0.168 (0.109)	–	–	–
Indexes based on binary IPR scope tangible pl – layout-designs of integrated circuits	-0.06 (0.064)	-0.046 (0.064)	-0.01 (0.028)	-0.146 (0.23)
Indexes based on binary IPR scope tangible pl – new plant varieties	-0.235 (0.151)	-0.112 (0.083)	0.013 (0.107)	-0.086 (0.216)
Indexes based on binary IPR scope tangible pl – traditional knowledge & genetic resources	0.025 (0.072)	0.054 (0.035)	0.029 (0.031)	0.007 (0.057)
Indexes based on binary IPR scope tangible pl – encrypted program-carrying satellite signals	-0.242 (0.238)	-0.091 (0.177)	0.119 (0.128)	-0.332 (0.309)
Indexes based on binary IPR scope tangible pl – domain names	0.023 (0.232)	-0.097 (0.199)	-0.116 (0.146)	-0.087 (0.297)
Index IPR specific enforcement pd (sum)	0.063** (0.024)	0.072*** (0.019)	0.011 (0.018)	0.105** (0.033)
Index IPR multilateral coherence pd (sum)	-0.024*** (0.006)	-0.02*** (0.005)	-0.005 (0.016)	-0.024*** (0.007)
Control Variables				
Democratisation (Polity 2) (mean)	0.026 (0.026)	0.023 (0.026)	0.027 (0.03)	0.003 (0.029)
Classic IP leaders	1.03*** (0.276)	1.131*** (0.261)	0.243 (0.237)	0.759* (0.365)

Countries with a high increase of patent protection	0.134 (0.247)	0.124 (0.243)	-0.008 (0.191)	0.423 (0.284)
New IP producers and developers	0.032 (0.231)	0.101 (0.224)	0.015 (0.18)	0.014 (0.284)
ln GDP (mean)	0.181* (0.087)	0.152. (0.083)	0.133* (0.066)	0.024 (0.106)
ln GDPpc (mean)	0.017 (0.124)	0.079 (0.119)	0.025 (0.117)	0.124 (0.149)
ln Geographic distance (mean)	0.15 (0.109)	0.123 (0.106)	0.019 (0.092)	0.15 (0.123)
Intercept	–	–	-3.495. (2.093)	-5.531* (2.196)
Model	m9pds1_op	m9pds1.2_op	m9pds1.2_hp Count Data (Stage 2)	m9pds1.2_hp Zero Data (Stage 1)
Observations	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 44: Design Regression – Index IPR Specific Enforcement (sum) ~ Path Dependency (TRIPS-plus)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	-0.119** (0.041)	-0.054 (0.058)	0.258** (0.095)
Veto Players			
Veto players (sum)	-0.009 (0.057)	0.021 (0.072)	-0.041 (0.093)
Endogeneity			
PTA depth	0.244*** (0.067)	-0.014 (0.06)	-0.46*** (0.11)
Regime Preference			
Index IPR multilateral coherence (sum)	0.023*** (0.003)	0.004 (0.003)	-0.033*** (0.007)
Path Dependency			
Indexes based on binary TRIPS-plus categories pd – copyrights	0.062 (0.112)	0.053 (0.104)	-0.364 (0.261)
Indexes based on binary TRIPS-plus categories pd – trademarks	-0.062 (0.137)	-0.188. (0.108)	-0.453 (0.403)
Indexes based on binary TRIPS-plus categories pd – geographical indications	0.137. (0.083)	0.034 (0.11)	-0.108 (0.141)
Indexes based on binary TRIPS-plus categories pd – industrial designs	-0.142 (0.14)	0.008 (0.097)	-0.006 (0.235)
Indexes based on binary TRIPS-plus categories pd – patents	-0.003 (0.083)	0.102. (0.055)	0.853* (0.39)
Indexes based on binary TRIPS-plus categories pd – undisclosed information	0.03 (0.055)	-0.026 (0.049)	-0.037 (0.208)
Indexes based on binary TRIPS-plus categories pd – layout-designs of integrated circuits	0.164 (0.274)	-0.095 (0.194)	-0.874 (0.569)
Indexes based on binary TRIPS-plus categories pd – new plant varieties	0.155 (0.142)	0.041 (0.153)	-0.368. (0.222)
Indexes based on binary TRIPS-plus categories pd – traditional knowledge & genetic resources	0.049 (0.042)	0.002 (0.024)	-0.033 (0.088)
Indexes based on binary TRIPS-plus categories pd – encrypted program-carrying satellite signals	0.152 (0.244)	0.28 (0.194)	0.385 (0.498)
Indexes based on binary TRIPS-plus categories pd – domain names	-0.223 (0.223)	-0.235 (0.173)	-0.024 (0.427)
Indexes based on binary TRIPS-plus categories pd – enforcement	-0.118 (0.073)	-0.028 (0.068)	0.146 (0.136)
Indexes based on binary TRIPS-plus categories pd – exhaustion	-0.034 (0.067)	0.01 (0.029)	0.249 (0.258)
Control Variables			
Democratisation (Polity 2) (mean)	0.018 (0.026)	0.04. (0.023)	0.039 (0.04)
Classic IP leaders	0.997*** (0.275)	0.01 (0.208)	-1.342** (0.505)

Countries with a high increase of patent protection	0.064 (0.243)	-0.175 (0.184)	-1.016* (0.425)
New IP producers and developers	0.135 (0.226)	-0.081 (0.175)	-0.216 (0.381)
ln GDP (mean)	0.129 (0.084)	0.178** (0.069)	0.194 (0.139)
ln GDPpc (mean)	0.088 (0.12)	0.099 (0.111)	-0.143 (0.192)
ln Geographic distance (mean)	0.144 (0.106)	0.025 (0.09)	-0.201 (0.142)
Intercept	–	-5.225* (2.098)	1.186 (2.887)
Model	m9pdtp1_op	m9pdtp1_zip Count Data (Stage 2)	m9pdtp1_zip Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 45: Design Regression – Index IPR Specific Enforcement (sum) ~ Path Dependency (world, signature, specific)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	0 (0)	-0.018 (0.039)	-0.016 (3165)
Veto Players			
Veto players (sum)	0 (0)	-0.009 (0.017)	0.003 (3025)
Endogeneity			
PTA depth	0 (0)	-0.047 (0.069)	0.088 (3723)
Regime Preference			
Index IPR multilateral coherence (sum)	0 (0)	-0.008 (0.01)	-0.008 (1723)
Path Dependency			
Indexes based on binary IPR scope tangible pdw s – copyrights	0*** (0)	0.119 (0.229)	-19.63 (1163000)
Indexes based on binary IPR scope tangible pdw s – trademarks	0*** (0)	0.102 (0.268)	0.175 (52210)
Indexes based on binary IPR scope tangible pdw s – geographical indications	0*** (0)	-0.075 (0.168)	0.116 (14960)
Indexes based on binary IPR scope tangible pdw s – industrial designs	0*** (0)	-0.052 (0.21)	-6.174 (1168000)
Indexes based on binary IPR scope tangible pdw s – patents	0*** (0)	0.01 (0.203)	-6.697 (1168000)
Indexes based on binary IPR scope tangible pdw s – undisclosed information	0 (0)	0.03 (0.163)	-7.364 (1171000)
Indexes based on binary IPR scope tangible pdw s – layout-designs of integrated circuits	0* (0)	0.061 (0.302)	0.194 (355300)
Indexes based on binary IPR scope tangible pdw s – new plant varieties	0 (0)	0.125 (0.197)	-6.909 (1164000)
Indexes based on binary IPR scope tangible pdw s – traditional knowledge & genetic resources	0* (0)	0.003 (0.234)	19.73 (1162000)
Indexes based on binary IPR scope tangible pdw s – encrypted program-carrying satellite signals	0 (0)	0.097 (0.22)	0.31 (179700)
Indexes based on binary IPR scope tangible pdw s – domain names	0*** (0)	-0.303 (0.311)	-26.51 (2117000)
Index IPR specific enforcement pdw s (sum)	1*** (0)	0.367*** (0.069)	13.39 (9533)
Index IPR multilateral coherence pdw s (sum)	0 (0)	0.037 (0.053)	0.04 (8429)
Control Variables			
Democratisation (Polity 2) (mean)	0 (0)	0.013 (0.025)	-0.008 (1063)
Classic IP leaders	0 (0)	0.086 (0.22)	-0.08 (23820)

Countries with a high increase of patent protection	0 (0)	0.12 (0.205)	0.096 (15410)
New IP producers and developers	0 (0)	0.045 (0.17)	-0.017 (13870)
ln GDP (mean)	0. (0)	-0.04 (0.078)	-0.04 (4304)
ln GDPpc (mean)	0 (0)	0.045 (0.112)	0.04 (6729)
ln Geographic distance (mean)	0 (0)	0.005 (0.102)	0.009 (5887)
Intercept	–	0.274 (2.034)	-6.583 (90990)
Model	m9pdwss1_ ols	m9pdwss1_ hp	m9pdwss1_ hp
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 46: Design Regression – Index IPR Specific Enforcement (sum) ~ Path Dependency (world, signature, TRIPS-plus)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	-0.1** (0.033)	-0.064. (0.035)	-0.028 (0.057)
Veto Players			
Veto players (sum)	0.001 (0.031)	0.006 (0.017)	0.041 (0.068)
Endogeneity			
PTA depth	0.233** (0.074)	0.03 (0.06)	0.336** (0.108)
Regime Preference			
Index IPR multilateral coherence (sum)	0.008. (0.005)	-0.001 (0.003)	0.005 (0.008)
Path Dependency			
Indexes based on binary TRIPS-plus categories pdw s – copyrights	-0.638 (0.661)	-0.027 (0.34)	-4.477 (1897)
Indexes based on binary TRIPS-plus categories pdw s – geographical indications	0.292 (0.528)	0.156 (0.291)	5.218 (2092)
Indexes based on binary TRIPS-plus categories pdw s – industrial designs	1.986*** (0.366)	1.13* (0.485)	1.817** (0.688)
Indexes based on binary TRIPS-plus categories pdw s – patents	0.819* (0.371)	0.188 (0.206)	5.576 (1648)
Indexes based on binary TRIPS-plus categories pdw s – undisclosed information	0.506 (0.401)	0.357 (0.241)	4.208 (937.3)
Indexes based on binary TRIPS-plus categories pdw s – layout-designs of integrated circuits	-0.428 (0.284)	-0.036 (0.169)	-0.971 (0.72)
Indexes based on binary TRIPS-plus categories pdw s – new plant varieties	1.354*** (0.342)	0.414* (0.179)	7.538 (1400)
Indexes based on binary TRIPS-plus categories pdw s – traditional knowledge & genetic resources	0.586 (0.393)	-0.045 (0.204)	0.541 (4530)
Indexes based on binary TRIPS-plus categories pdw s – encrypted program-carrying satellite signals	-0.143 (0.382)	-0.187 (0.217)	-1.084 (4914)
Indexes based on binary TRIPS-plus categories pdw s – domain names	-1.986* (0.928)	-0.639 (0.483)	-5.656 (7577)
Indexes based on binary TRIPS-plus categories pdw s – enforcement	0.143 (0.314)	0.062 (0.181)	0.531 (0.748)
Indexes based on binary TRIPS-plus categories pdw s – exhaustion	-0.466 (0.336)	-0.182 (0.197)	5.195 (1658)
Control Variables			
Democratisation (Polity 2) (mean)	0.021 (0.028)	0.029 (0.024)	-0.006 (0.035)
Classic IP leaders	0.819** (0.308)	0.354. (0.201)	-0.551 (0.605)
Countries with a high increase of patent protection	0.114 (0.285)	0.041 (0.212)	0.246 (0.368)

New IP producers and developers	0.147 (0.236)	0.036 (0.153)	0.114 (0.338)
ln GDP (mean)	0.104 (0.1)	0.101 (0.08)	0.076 (0.151)
ln GDPpc (mean)	-0.07 (0.142)	-0.028 (0.115)	-0.026 (0.212)
ln Geographic distance (mean)	0.193 (0.122)	0.099 (0.095)	0.109 (0.186)
Intercept	–	-3.825. (2.128)	-5.403. (2.887)
Model	m9pdwstp1_op	m9pdwstp1_hp	m9pdwstp1_hp
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 47: Design Regression – Index IPR Specific Enforcement (sum) ~ Path Dependency (world, force, specific)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	0 (0)	-0.017 (0.04)	-0.015 (2730)
Veto Players			
Veto players (sum)	0 (0)	-0.007 (0.017)	0.012 (2150)
Endogeneity			
PTA depth	0 (0)	-0.04 (0.071)	0.083 (3810)
Regime Preference			
Index IPR multilateral coherence (sum)	0 (0)	-0.009 (0.011)	-0.011 (1846)
Path Dependency			
Indexes based on binary IPR scope tangible pdw f – copyrights	0*** (0)	0.128 (0.23)	-19.65 (1172000)
Indexes based on binary IPR scope tangible pdw f – trademarks	0*** (0)	0.092 (0.273)	0.161 (50050)
Indexes based on binary IPR scope tangible pdw f – geographical indications	0*** (0)	-0.081 (0.171)	0.105 (15690)
Indexes based on binary IPR scope tangible pdw f – industrial designs	0*** (0)	-0.053 (0.209)	-6.228 (1182000)
Indexes based on binary IPR scope tangible pdw f – patents	0** (0)	0.008 (0.203)	-6.672 (1183000)
Indexes based on binary IPR scope tangible pdw f – undisclosed information	0 (0)	0.061 (0.17)	-7.237 (1182000)
Indexes based on binary IPR scope tangible pdw f – layout-designs of integrated circuits	0. (0)	0.053 (0.308)	0.243 (419000)
Indexes based on binary IPR scope tangible pdw f – new plant varieties	0 (0)	0.108 (0.204)	-6.976 (1173000)
Indexes based on binary IPR scope tangible pdw f – traditional knowledge & genetic resources	0 (0)	-0.021 (0.245)	19.79 (1172000)
Indexes based on binary IPR scope tangible pdw f – encrypted program-carrying satellite signals	0 (0)	0.103 (0.22)	0.244 (206000)
Indexes based on binary IPR scope tangible pdw f – domain names	0*** (0)	-0.315 (0.333)	-26.46 (2103000)
Index IPR specific enforcement pdw f (sum)	1*** (0)	0.366*** (0.07)	13.4 (9808)
Index IPR multilateral coherence pdw f (sum)	0 (0)	0.043 (0.059)	0.046 (9037)
Control Variables			
Democratisation (Polity 2) (mean)	0 (0)	0.011 (0.025)	-0.008 (1130)
Classic IP leaders	0 (0)	0.102 (0.264)	-0.08 (24640)

Countries with a high increase of patent protection	0 (0)	0.126 (0.242)	0.103 (15010)
New IP producers and developers	0 (0)	0.062 (0.186)	-0.022 (14150)
ln GDP (mean)	0. (0)	-0.051 (0.081)	-0.04 (4368)
ln GDPpc (mean)	0 (0)	0.036 (0.114)	0.044 (7150)
ln Geographic distance (mean)	0 (0)	0.003 (0.105)	0.01 (6169)
Intercept	–	0.589 (2.066)	-6.627 (93770)
Model	m9pdwfs1_ ols	m9pdwfs1_ hp	m9pdwfs1_ hp
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	484	484	484

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 48: Design Regression – Index IPR Multilateral Coherence (sum) ~ Path Dependency (general)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	0.137*** (0.034)	0.054*** (0.008)	-0.163** (0.06)
Veto Players			
Veto players (sum)	-0.285*** (0.068)	-0.166*** (0.019)	0.182. (0.101)
Endogeneity			
PTA depth	0.259*** (0.049)	0.104*** (0.012)	-0.277*** (0.084)
Index IPR enforcement (sum)	0.274*** (0.029)	0.114*** (0.005)	-1.167*** (0.146)
Path Dependency			
Index IPR general pd (sum)	-0.003 (0.012)	-0.003 (0.003)	-0.017 (0.021)
Index based on binary IPR scope mentioned pl – copyrights	-0.062 (0.169)	-0.045 (0.044)	-0.022 (0.251)
Index based on binary IPR scope mentioned pl – trademarks	0.339 (0.249)	-0.095 (0.072)	-0.489 (0.382)
Index based on binary IPR scope mentioned pl – geographical indications	-0.073 (0.155)	-0.038 (0.034)	0.237 (0.318)
Index based on binary IPR scope mentioned pl – industrial designs	-0.011 (0.277)	-0.082 (0.066)	-0.058 (0.39)
Index based on binary IPR scope mentioned pl – patents	-0.114 (0.326)	0.246** (0.084)	0.475 (0.482)
Index based on binary IPR scope mentioned pl – undisclosed information	-0.291 (0.205)	-0.204*** (0.047)	0.039 (0.408)
Index based on binary IPR scope mentioned pl – layout-designs of integrated circuits	0.269* (0.13)	0.253*** (0.028)	-0.199 (0.264)
Index based on binary IPR scope mentioned pl – new plant varieties	-0.068. (0.035)	-0.036*** (0.007)	0.172** (0.062)
Index based on binary IPR scope mentioned pl – traditional knowledge & genetic resources	-0.121*** (0.026)	-0.06*** (0.004)	0.013 (0.053)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	-0.067 (0.046)	0.027** (0.008)	0.267** (0.099)
Index based on binary IPR scope mentioned pl – domain names	-0.058 (0.1)	0.082*** (0.017)	0.766** (0.243)
Index IPR general enforcement pd (sum)	-0.01 (0.02)	-0.005 (0.004)	-0.009 (0.038)
Index IPR multilateral coherence pl (dummy sum)	0.016*** (0.003)	0.007*** (0.001)	-0.017** (0.006)
Control Variables			
Democratisation (Polity 2) (mean)	0.056*** (0.015)	0.004 (0.004)	-0.046* (0.022)

Classic IP leaders	-0.083 (0.221)	0.103** (0.038)	-0.08 (0.535)
Countries with a high increase of patent protection	-0.014 (0.178)	0.146*** (0.038)	0.33 (0.301)
New IP producers and developers	-0.323. (0.167)	-0.367*** (0.036)	-0.104 (0.301)
ln GDP (mean)	-0.107. (0.057)	-0.019 (0.013)	0.206* (0.097)
ln GDPpc (mean)	0.167* (0.079)	0.01 (0.02)	-0.194 (0.121)
ln Geographic distance (mean)	-0.105 (0.066)	-0.083*** (0.017)	-0.114 (0.102)
Intercept	–	3.596*** (0.268)	-0.895 (1.849)
Model	m10pdg1_op	m10pdg1_zip Count Data (Stage 2)	m10pdg1_zip Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 49: Design Regression – Index IPR Multilateral Coherence (sum) ~ Path Dependency (specific)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	0.098** (0.035)	0.066 (0.043)	-0.144* (0.065)
Veto Players			
Veto players (sum)	-0.162*** (0.048)	-0.118* (0.052)	0.093 (0.072)
Endogeneity			
PTA depth	0.295*** (0.049)	0.129* (0.061)	-0.409*** (0.102)
Index IPR enforcement (sum)	0.29*** (0.029)	0.145*** (0.028)	-1.447*** (0.278)
Path Dependency			
Indexes based on binary IPR scope tangible pl – copyrights	-0.349* (0.139)	-0.241. (0.139)	0.089 (0.42)
Indexes based on binary IPR scope tangible pl – trademarks	0.121 (0.189)	0.007 (0.193)	0.307 (0.508)
Indexes based on binary IPR scope tangible pl – geographical indications	-0.277*** (0.066)	-0.135* (0.066)	0.356 (0.251)
Indexes based on binary IPR scope tangible pl – industrial designs	0.146 (0.156)	-0.244 (0.18)	-0.543 (0.486)
Indexes based on binary IPR scope tangible pl – patents	0.081 (0.179)	0.513* (0.204)	0.419 (0.494)
Indexes based on binary IPR scope tangible pl – undisclosed information	0.022 (0.029)	0.011 (0.031)	0.013 (0.074)
Indexes based on binary IPR scope tangible pl – layout-designs of integrated circuits	-0.054 (0.056)	0.008 (0.055)	0.321 (0.428)
Indexes based on binary IPR scope tangible pl – new plant varieties	0.039 (0.124)	-0.003 (0.14)	-0.316 (0.381)
Indexes based on binary IPR scope tangible pl – traditional knowledge & genetic resources	0.089 (0.062)	0.077 (0.065)	-0.284 (0.242)
Indexes based on binary IPR scope tangible pl – encrypted program-carrying satellite signals	0.121 (0.175)	-0.069 (0.2)	-0.61 (0.404)
Indexes based on binary IPR scope tangible pl – domain names	-0.031 (0.167)	0.165 (0.208)	1.087** (0.409)
Index IPR specific enforcement pd (sum)	-0.025. (0.013)	-0.015 (0.016)	0 (0.057)
Index IPR multilateral coherence pd (sum)	0.016*** (0.004)	0.007 (0.004)	-0.018. (0.01)
Control Variables			
Democratisation (Polity 2) (mean)	0.029* (0.014)	-0.015 (0.02)	-0.027 (0.023)
Classic IP leaders	-0.12 (0.224)	0.477* (0.233)	0.032 (0.574)
Countries with a high increase of patent protection	-0.1 (0.183)	0.209 (0.263)	0.469 (0.423)

New IP producers and developers	-0.282 (0.174)	-0.431* (0.195)	-0.67 (0.431)
ln GDP (mean)	-0.091. (0.055)	-0.011 (0.071)	0.209. (0.11)
ln GDPpc (mean)	0.144. (0.077)	-0.112 (0.103)	-0.167 (0.138)
ln Geographic distance (mean)	-0.051 (0.066)	-0.039 (0.09)	-0.2 (0.123)
Intercept	–	3.853** (1.413)	-0.365 (1.989)
log(theta)	–	0.132 (0.121)	–
Model	m10pds1_op	m10pds1_zinb	m10pds1_zinb
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 50: Design Regression – Index IPR Multilateral Coherence (sum) ~ Path Dependency (TRIPS-plus)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	0.072* (0.032)	0.01. (0.005)	-0.157** (0.058)
Veto Players			
Veto players (sum)	-0.083* (0.04)	-0.062*** (0.01)	0.085 (0.06)
Endogeneity			
PTA depth	0.307*** (0.049)	0.122*** (0.012)	-0.336*** (0.08)
Index IPR enforcement (sum)	0.268*** (0.029)	0.107*** (0.005)	-1.049*** (0.14)
Path Dependency			
Indexes based on binary TRIPS-plus categories pd – copyrights	0.096 (0.087)	-0.016 (0.015)	-0.317 (0.193)
Indexes based on binary TRIPS-plus categories pd – trademarks	-0.244* (0.107)	-0.077*** (0.019)	0.347 (0.211)
Indexes based on binary TRIPS-plus categories pd – geographical indications	0.057 (0.039)	0.015* (0.007)	-0.066 (0.079)
Indexes based on binary TRIPS-plus categories pd – industrial designs	0.342*** (0.097)	0.028 (0.02)	-0.661*** (0.177)
Indexes based on binary TRIPS-plus categories pd – patents	-0.143* (0.073)	-0.026* (0.01)	0.133 (0.316)
Indexes based on binary TRIPS-plus categories pd – undisclosed information	-0.08. (0.044)	-0.008 (0.007)	0.545. (0.305)
Indexes based on binary TRIPS-plus categories pd – layout-designs of integrated circuits	-0.264 (0.212)	-0.23*** (0.043)	0.038 (0.5)
Indexes based on binary TRIPS-plus categories pd – new plant varieties	-0.036 (0.108)	0.12*** (0.022)	0.362. (0.203)
Indexes based on binary TRIPS-plus categories pd – traditional knowledge & genetic resources	0.024 (0.037)	-0.02*** (0.006)	-0.39 (0.327)
Indexes based on binary TRIPS-plus categories pd – encrypted program-carrying satellite signals	-0.001 (0.171)	-0.039 (0.039)	-0.639. (0.362)
Indexes based on binary TRIPS-plus categories pd – domain names	0.149 (0.161)	0.146*** (0.034)	0.678. (0.366)
Indexes based on binary TRIPS-plus categories pd – enforcement	0.02 (0.036)	-0.004 (0.007)	0.009 (0.07)
Indexes based on binary TRIPS-plus categories pd – exhaustion	-0.019 (0.057)	0.025** (0.008)	0.242 (0.323)
Control Variables			
Democratisation (Polity 2) (mean)	0.027. (0.014)	0.001 (0.004)	-0.017 (0.021)
Classic IP leaders	-0.184 (0.221)	0.093* (0.042)	-0.128 (0.501)

Countries with a high increase of patent protection	-0.067 (0.182)	0.2*** (0.04)	0.526. (0.318)
New IP producers and developers	-0.369* (0.172)	-0.313*** (0.037)	-0.013 (0.303)
ln GDP (mean)	-0.059 (0.056)	0.014 (0.013)	0.145 (0.09)
ln GDPpc (mean)	0.106 (0.078)	-0.019 (0.02)	-0.106 (0.114)
ln Geographic distance (mean)	-0.086 (0.066)	-0.088*** (0.017)	-0.102 (0.099)
Intercept	–	2.972*** (0.268)	-0.233 (1.712)
Model	m10pdtp1_op	m10pdtp1_zip	m10pdtp1_zip
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 51: Design Regression – Index IPR Multilateral Coherence (sum) ~ Path Dependency (world, signature)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure				
PTA members on Special 301 Reports (sum)	-0.001 (0.025)	0.076*** (0.023)	0.05. (0.029)	0.085* (0.039)
Veto Players				
Veto players (sum)	-0.069** (0.021)	-0.04. (0.024)	-0.048 (0.03)	-0.016 (0.041)
Endogeneity				
PTA depth	0.266*** (0.055)	0.26*** (0.048)	0.16* (0.071)	0.141. (0.076)
Index IPR enforcement (sum)	-0.077 (0.079)	0.242*** (0.042)	0.063 (0.047)	1.127*** (0.14)
Path Dependency Specific				
Indexes based on binary IPR scope tangible pdw s – copyrights	-0.333 (0.35)	–	–	–
Indexes based on binary IPR scope tangible pdw s – trademarks	-1.029** (0.354)	–	–	–
Indexes based on binary IPR scope tangible pdw s – geographical indications	-0.366 (0.224)	–	–	–
Indexes based on binary IPR scope tangible pdw s – industrial designs	-0.148 (0.374)	–	–	–
Indexes based on binary IPR scope tangible pdw s – patents	-0.562 (0.352)	–	–	–
Indexes based on binary IPR scope tangible pdw s – undisclosed information	0.777** (0.298)	–	–	–
Indexes based on binary IPR scope tangible pdw s – layout-designs of integrated circuits	1.738** (0.542)	–	–	–
Indexes based on binary IPR scope tangible pdw s – new plant varieties	0.583 (0.383)	–	–	–
Indexes based on binary IPR scope tangible pdw s – traditional knowledge & genetic resources	-0.069 (0.329)	–	–	–
Indexes based on binary IPR scope tangible pdw s – encrypted program-carrying satellite signals	0.539 (0.398)	–	–	–
Indexes based on binary IPR scope tangible pdw s – domain names	-3.532*** (0.542)	–	–	–
Index IPR specific enforcement pdw s (sum)	0.137 (0.131)	–	–	–
Index IPR multilateral coherence pdw s (sum)	1.21*** (0.057)	–	–	–
Path Dependency TRIPS-plus				
Indexes based on binary TRIPS-plus categories pdw s – copyrights	–	0.458* (0.203)	-0.114 (0.222)	0.511. (0.298)
Indexes based on binary TRIPS-plus categories pdw s – geographical indications	–	0.321 (0.453)	0.344 (0.535)	-2.387 (1931.499)

Indexes based on binary TRIPS-plus categories pdw s – industrial designs	–	-0.179 (0.327)	-0.096 (0.338)	4.082 (1031.724)
Indexes based on binary TRIPS-plus categories pdw s – patents	–	-0.014 (0.343)	0.409 (0.329)	-1.363 (1824.05)
Indexes based on binary TRIPS-plus categories pdw s – undisclosed information	–	0.145 (0.365)	0.243 (0.351)	-2.122 (1988.261)
Indexes based on binary TRIPS-plus categories pdw s – layout-designs of integrated circuits	–	0.406 (0.254)	0.194 (0.255)	2.165 (1085.613)
Indexes based on binary TRIPS-plus categories pdw s – new plant varieties	–	-0.402 (0.284)	-0.112 (0.299)	0.604 (1323.894)
Indexes based on binary TRIPS-plus categories pdw s – traditional knowledge & genetic resources	–	-0.7* (0.354)	-0.213 (0.335)	-0.552 (1444.736)
Indexes based on binary TRIPS-plus categories pdw s – encrypted program-carrying satellite signals	–	-0.491 (0.341)	-0.748* (0.326)	-1.783 (1608.233)
Indexes based on binary TRIPS-plus categories pdw s – domain names	–	-0.072 (0.833)	-0.75 (0.829)	-2.407 (3198.234)
Indexes based on binary TRIPS-plus categories pdw s – enforcement	–	1.146*** (0.274)	0.859** (0.263)	0.42 (725.376)
Indexes based on binary TRIPS-plus categories pdw s – exhaustion	–	0.247 (0.291)	0.211 (0.299)	-2.642 (1254.421)
Control Variables				
Democratisation (Polity 2) (mean)	0.047** (0.016)	0.027* (0.014)	-0.004 (0.021)	0.02 (0.018)
Classic IP leaders	-0.791** (0.254)	-0.163 (0.23)	0.583* (0.256)	-0.249 (0.446)
Countries with a high increase of patent protection	-0.151 (0.2)	-0.222 (0.188)	0.112 (0.289)	-0.348 (0.285)
New IP producers and developers	-0.063 (0.176)	-0.312. (0.163)	-0.591** (0.186)	0.24 (0.257)
ln GDP (mean)	0.045 (0.063)	-0.051 (0.057)	-0.049 (0.077)	-0.143. (0.082)
ln GDPpc (mean)	0.057 (0.09)	0.121 (0.079)	-0.121 (0.113)	0.09 (0.107)
ln Geographic distance (mean)	0.084 (0.074)	-0.182** (0.066)	-0.139 (0.089)	-0.071 (0.093)
Intercept	–	–	5.631*** (1.515)	1.854 (1.577)
log(theta)	–	–	0.113 (0.116)	–
Model	m10pdwss3_op	m10pdwstp1_op	m10pdwstp1_hnb	m10pdwstp1_hnb
			Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 52: Design Regression – Index TRIPS-plus (sum) ~ Path Dependency (general)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	-0.087. (0.05)	-0.043 (0.04)	0.181 (0.228)
Veto Players			
Veto players (sum)	-0.004 (0.078)	0.07 (0.093)	0.756 (0.709)
Endogeneity			
PTA depth	0.308*** (0.075)	0.104. (0.057)	-0.605. (0.368)
Index IPR specific enforcement (sum)	0.671*** (0.071)	0.242*** (0.049)	-3.523** (1.216)
Regime Preference			
Index IPR multilateral coherence (sum)	0.009* (0.004)	0.006* (0.003)	-0.061* (0.026)
Path Dependency			
Index IPR general pd (sum)	0.006 (0.018)	0.001 (0.012)	-0.236. (0.122)
Index based on binary IPR scope mentioned pl – copyrights	0.23 (0.336)	0.24 (0.261)	1.379 (1.241)
Index based on binary IPR scope mentioned pl – trademarks	0.087 (0.498)	-0.735. (0.394)	2.119 (2.312)
Index based on binary IPR scope mentioned pl – geographical indications	0.226 (0.225)	-0.163 (0.131)	-4.789* (2.082)
Index based on binary IPR scope mentioned pl – industrial designs	1.125. (0.631)	0.4 (0.518)	-7.64 (4.878)
Index based on binary IPR scope mentioned pl – patents	-1.368* (0.642)	-0.033 (0.516)	8.342 (5.085)
Index based on binary IPR scope mentioned pl – undisclosed information	-0.443 (0.327)	0.136 (0.247)	-0.606 (2.004)
Index based on binary IPR scope mentioned pl – layout-designs of integrated circuits	0.17 (0.192)	0.131 (0.127)	1.179 (0.946)
Index based on binary IPR scope mentioned pl – new plant varieties	0.012 (0.057)	0.001 (0.051)	-0.489. (0.291)
Index based on binary IPR scope mentioned pl – traditional knowledge & genetic resources	-0.047 (0.033)	-0.019 (0.02)	0.762* (0.369)
Index based on binary IPR scope mentioned pl – encrypted program-carrying satellite signals	0 (0.065)	0.011 (0.052)	-0.256 (0.35)
Index based on binary IPR scope mentioned pl – domain names	0.351** (0.122)	0.116. (0.07)	-1.417* (0.68)
Index IPR general enforcement pd (sum)	0.005 (0.031)	0.006 (0.02)	0.282 (0.207)
Index IPR multilateral coherence pl (dummy sum)	0 (0.004)	-0.001 (0.003)	0.007 (0.021)
Control Variables			

Democratisation (Polity 2) (mean)	0.001 (0.028)	-0.023 (0.022)	-0.254 (0.157)
Classic IP leaders	0.184 (0.3)	0.082 (0.172)	4.023. (2.079)
Countries with a high increase of patent protection	-0.156 (0.271)	-0.305. (0.17)	3.755* (1.786)
New IP producers and developers	-0.415 (0.257)	-0.25 (0.154)	-0.69 (0.871)
ln GDP (mean)	0.169. (0.091)	0.2** (0.061)	-1.867* (0.923)
ln GDPpc (mean)	-0.329* (0.132)	-0.476*** (0.106)	0.62 (0.801)
ln Geographic distance (mean)	0.102 (0.117)	-0.102 (0.081)	-0.72 (0.444)
Intercept	–	0.766 (1.753)	57.558* (26.157)
log(theta)	–	1.82*** (0.241)	–
Model	m11pdg3_op	m11pdg3_zinb	m11pdg3_zinb
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 53: Design Regression – Index TRIPS-plus (sum) ~ Path Dependency (specific)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	-0.064 (0.05)	-0.055 (0.036)	-0.05 (0.096)
Veto Players			
Veto players (sum)	0.024 (0.074)	0.014 (0.07)	0.036 (0.121)
Endogeneity			
PTA depth	0.171* (0.08)	0.062 (0.051)	0.027 (0.14)
Index IPR enforcement (sum)	0.422*** (0.045)	0.162*** (0.028)	0.481*** (0.082)
Regime Preference			
Index IPR multilateral coherence (sum)	0.012** (0.004)	0.003 (0.003)	0.024** (0.008)
Path Dependency			
Indexes based on binary IPR scope tangible pl – copyrights	0.028 (0.165)	-0.045 (0.089)	0.423 (0.427)
Indexes based on binary IPR scope tangible pl – trademarks	-0.295 (0.226)	-0.039 (0.123)	-0.852* (0.405)
Indexes based on binary IPR scope tangible pl – geographical indications	0.226* (0.104)	-0.021 (0.056)	0.848** (0.296)
Indexes based on binary IPR scope tangible pl – industrial designs	0.269 (0.227)	0.013 (0.124)	0.311 (0.423)
Indexes based on binary IPR scope tangible pl – patents	-0.048 (0.276)	0.089 (0.164)	-0.118 (0.451)
Indexes based on binary IPR scope tangible pl – undisclosed information	-0.2* (0.079)	-0.028 (0.033)	-0.424 (0.297)
Indexes based on binary IPR scope tangible pl – layout-designs of integrated circuits	0.041 (0.06)	0.008 (0.024)	-0.088 (0.403)
Indexes based on binary IPR scope tangible pl – new plant varieties	-0.086 (0.152)	-0.039 (0.085)	-0.09 (0.361)
Indexes based on binary IPR scope tangible pl – traditional knowledge & genetic re-sources	-0.017 (0.074)	0.019 (0.041)	-0.249 (0.204)
Indexes based on binary IPR scope tangible pl – encrypted program-carrying satellite signals	0.395. (0.237)	0.23. (0.129)	-0.194 (0.539)
Indexes based on binary IPR scope tangible pl – domain names	-0.198 (0.229)	-0.183 (0.123)	0.328 (0.432)
Index IPR specific enforcement pd (sum)	0.029 (0.019)	-0.008 (0.009)	0.173* (0.07)
Index IPR multilateral coherence pd (sum)	-0.003 (0.006)	0.004 (0.004)	-0.034* (0.015)
Control Variables			
Democratisation (Polity 2) (mean)	-0.018 (0.028)	-0.001 (0.019)	-0.016 (0.046)
Classic IP leaders	0.413 (0.3)	-0.099 (0.167)	0.565 (0.603)

Countries with a high increase of patent protection	-0.131 (0.28)	-0.1 (0.158)	-0.172 (0.55)
New IP producers and developers	-0.716** (0.271)	-0.371* (0.153)	-0.984* (0.497)
ln GDP (mean)	0.147 (0.096)	0.202*** (0.058)	-0.032 (0.181)
ln GDPpc (mean)	-0.165 (0.137)	-0.222* (0.087)	0.056 (0.251)
ln Geographic distance (mean)	0.148 (0.118)	-0.066 (0.074)	0.363* (0.184)
Intercept	–	-2 (1.524)	-5.674 (3.623)
log(theta)	–	2.249*** (0.282)	–
Model	m11pds1_op	m11pds1_hnb	m11pds1_hnb
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 54: Design Regression – Index TRIPS-plus (sum) ~ Path Dependency (TRIPS-plus)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure			
PTA members on Special 301 Reports (sum)	-0.049 (0.045)	-0.04 (0.033)	-0.017 (0.123)
Veto Players			
Veto players (sum)	0.008 (0.06)	0.083. (0.05)	1.036. (0.556)
Endogeneity			
PTA depth	0.347*** (0.078)	0.079. (0.046)	-0.6* (0.301)
Index IPR specific enforcement (sum)	0.67*** (0.069)	0.172*** (0.036)	-2.636** (0.837)
Regime Preference			
Index IPR multilateral coherence (sum)	0.013*** (0.004)	0.012*** (0.003)	-0.028. (0.015)
Path Dependency			
Indexes based on binary TRIPS-plus categories pd – copyrights	-0.076 (0.121)	-0.22* (0.087)	0.45 (0.492)
Indexes based on binary TRIPS-plus categories pd – trademarks	-0.015 (0.147)	0.137 (0.093)	0.125 (0.433)
Indexes based on binary TRIPS-plus categories pd – geographical indications	-0.027 (0.067)	-0.153* (0.064)	0.259 (0.219)
Indexes based on binary TRIPS-plus categories pd – industrial designs	0.263. (0.148)	0.089 (0.075)	-1.016. (0.574)
Indexes based on binary TRIPS-plus categories pd – patents	-0.06 (0.081)	0.023 (0.037)	0.382 (0.345)
Indexes based on binary TRIPS-plus categories pd – undisclosed information	0.015 (0.058)	0.082* (0.041)	0.049 (0.613)
Indexes based on binary TRIPS-plus categories pd – layout-designs of integrated circuits	1.044** (0.323)	0.79*** (0.151)	3.848* (1.627)
Indexes based on binary TRIPS-plus categories pd – new plant varieties	-0.103 (0.162)	-0.01 (0.104)	-0.31 (0.485)
Indexes based on binary TRIPS-plus categories pd – traditional knowledge & genetic resources	0.007 (0.043)	0.014 (0.018)	-0.007 (0.672)
Indexes based on binary TRIPS-plus categories pd – encrypted program-carrying satellite signals	-0.231 (0.274)	-0.305* (0.148)	-1.794. (0.982)
Indexes based on binary TRIPS-plus categories pd – domain names	0.475. (0.25)	0.288* (0.13)	0.924 (0.837)
Indexes based on binary TRIPS-plus categories pd – enforcement	0.038 (0.057)	0.027 (0.036)	-0.157 (0.151)
Indexes based on binary TRIPS-plus categories pd – exhaustion	0.016 (0.064)	-0.031 (0.024)	-0.376 (0.532)
Control Variables			
Democratisation (Polity 2) (mean)	-0.014 (0.027)	-0.016 (0.017)	-0.155 (0.123)

Classic IP leaders	0.048 (0.31)	-0.011 (0.166)	0.288 (1.115)
Countries with a high increase of patent protection	-0.347 (0.281)	-0.267. (0.137)	0.17 (0.966)
New IP producers and developers	-0.614* (0.257)	-0.311* (0.152)	0.335 (1.111)
ln GDP (mean)	0.089 (0.094)	0.063 (0.059)	-0.017 (0.417)
ln GDPpc (mean)	-0.281* (0.13)	-0.268*** (0.078)	0.153 (0.574)
ln Geographic distance (mean)	0.196. (0.116)	-0.069 (0.07)	-0.953* (0.376)
Intercept	–	2.231 (1.572)	12.055 (8.575)
log(theta)	–	2.552*** (0.344)	–
Model	m11pdtp3_op	m11pdtp3_zinb	m11pdtp3_zinb
		Count Data (Stage 2)	Zero Data (Stage 1)
Observations	529	529	529

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 55: Design Regression – Index TRIPS-plus (sum) ~ Path Dependency (world, force)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Political Pressure				
PTA members on Special 301 Reports (sum)	-0.17*** (0.039)	-0.075*** (0.02)	-0.052 (0.218)	-0.047** (0.017)
Veto Players				
Veto players (sum)	0.197*** (0.029)	0.064*** (0.008)	0.132 (0.141)	0.037*** (0.008)
Endogeneity				
PTA depth	-0.071 (0.097)	-0.09* (0.042)	0.553 (0.444)	0.184 (0.317)
Index IPR enforcement (sum)	0.332** (0.115)	0.069. (0.041)	0.312 (0.481)	0.05* (0.02)
Regime Preference				
Index IPR multilateral coherence (sum)	0.02 (0.019)	0.011. (0.006)	0.025 (0.182)	0.006*** (0.002)
Path Dependency Specific				
Indexes based on binary IPR scope tangible pdw f – copyrights	2.554*** (0.402)	0.634*** (0.135)	8.254 (1847)	–
Indexes based on binary IPR scope tangible pdw f – trademarks	-0.648 (0.425)	0.101 (0.15)	-0.482 (1.746)	–
Indexes based on binary IPR scope tangible pdw f – geographical indications	2.761*** (0.314)	0.391*** (0.102)	5.313** (1.779)	–
Indexes based on binary IPR scope tangible pdw f – industrial designs	1.545*** (0.422)	0.179. (0.105)	13.37 (1588)	–
Indexes based on binary IPR scope tangible pdw f – patents	0.026 (0.388)	0.03 (0.108)	0.784 (2032)	–
Indexes based on binary IPR scope tangible pdw f – undisclosed information	-0.457 (0.328)	0.077 (0.088)	4.817 (2642)	–
Indexes based on binary IPR scope tangible pdw f – layout-designs of integrated circuits	1.056. (0.579)	0.184 (0.143)	8.406 (8751)	–
Indexes based on binary IPR scope tangible pdw f – new plant varieties	-0.512 (0.397)	0.031 (0.114)	-5.547 (7105)	–
Indexes based on binary IPR scope tangible pdw f – traditional knowledge & genetic resources	0.092 (0.378)	0.122 (0.116)	3.406 (2660)	–
Indexes based on binary IPR scope tangible pdw f – encrypted program-carrying satellite signals	1.591*** (0.43)	0.533*** (0.114)	-0.811 (2871)	–
Indexes based on binary IPR scope tangible pdw f – domain names	2.079** (0.668)	0.396* (0.174)	-4.393 (5694)	–
Index IPR specific enforcement pdw f (sum)	0.009 (0.18)	-0.057 (0.051)	-0.047 (1.007)	–
Index IPR multilateral coherence pdw f (sum)	-0.013 (0.095)	-0.017 (0.032)	-0.002 (0.906)	–
Path Dependency TRIPS-plus				
Indexes based on binary TRIPS-plus categories pdw f – copyrights	–	–	–	-0.047** (0.017)

Indexes based on binary TRIPS-plus categories pdw f – geographical indications	–	–	–	
Indexes based on binary TRIPS-plus categories pdw f – industrial designs	–	–	–	0.037*** (0.008)
Indexes based on binary TRIPS-plus categories pdw f – patents	–	–	–	
Indexes based on binary TRIPS-plus categories pdw f – undisclosed information	–	–	–	0.184 (0.317)
Indexes based on binary TRIPS-plus categories pdw f – new plant varieties	–	–	–	0.05* (0.02)
Indexes based on binary TRIPS-plus categories pdw f – traditional knowledge & genetic resources	–	–	–	
Indexes based on binary TRIPS-plus categories pdw f – encrypted program-carrying satellite signals	–	–	–	0.006*** (0.002)
Indexes based on binary TRIPS-plus categories pdw f – domain names	–	–	–	-0.047** (0.017)
Indexes based on binary TRIPS-plus categories pdw f – enforcement	–	–	–	
Indexes based on binary TRIPS-plus categories pdw f – exhaustion	–	–	–	0.037*** (0.008)
Control Variables				
Democratisation (Polity 2) (mean)	-0.046 (0.033)	-0.012 (0.012)	-0.124 (0.107)	-0.001 (0.011)
Classic IP leaders	-0.408 (0.374)	-0.079 (0.14)	-2.631 (2.831)	-0.132 (0.147)
Countries with a high increase of patent protection	-0.157 (0.353)	-0.074 (0.132)	-0.708 (1.87)	-0.207 (0.137)
New IP producers and developers	-0.698* (0.331)	-0.048 (0.094)	-0.157 (1.426)	-0.217* (0.09)
ln GDP (mean)	0.361** (0.119)	0.121** (0.045)	0.631 (0.678)	0.171*** (0.044)
ln GDPpc (mean)	0.002 (0.16)	-0.075 (0.062)	-1.142 (1.006)	-0.219*** (0.055)
ln Geographic distance (mean)	-0.236. (0.131)	-0.146** (0.054)	-0.172 (0.793)	-0.062 (0.052)
Intercept	–	-0.291 (1.097)	-10.76 (12.85)	-23.43 (1280)
Model	m11pdwfs1_op	m11pdwfs1_hp	m11pdwfs1_hp	m11pdwftp2_op
		Count Data (Stage 2)	Zero Data (Stage 1)	
Observations	484	484	484	484

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 56: Regression Tables of the Index IPR General and Specific Enforcement (sum)

Appendix 23 Design Regression Table 1: Index IPR General Enforcement (sum)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)
Veto Players		
Veto players (sum)	-0.002 (0.01)	-0.057 (0.05)
Control Variables		
Democratisation (Polity 2) (mean)	0.049** (0.018)	-0.064. (0.034)
Classic IP leaders	-0.099 (0.137)	-0.123 (0.692)
Countries with a high increase of patent protection	-0.361* (0.162)	0.586. (0.332)
New IP producers and developers	0.024 (0.112)	-8.187 (209.708)
ln GDP (mean)	0.152** (0.048)	-0.402** (0.123)
ln GDPpc (mean)	-0.058 (0.075)	-0.632** (0.197)
ln Geographic distance (mean)	0.366*** (0.057)	1.113*** (0.193)
Intercept	-6.04*** (0.908)	6.989*** (2.098)
Model	m14azip	m14azip
	Count Data (Stage 2)	Zero Data (Stage 1)
Observations	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 23 Design Regression Table 2: Index IPR Specific Enforcement (sum)

Explanatory Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
Veto Players			
Veto players (sum)	0 (0.014)	0 (0.008)	0.006 (0.016)
Control Variables			
Democratisation (Polity 2) (mean)	0.027 (0.019)	0.032. (0.018)	-0.016 (0.022)
Classic IP leaders	0.424* (0.21)	0.334* (0.136)	-0.215 (0.25)
Countries with a high increase of patent protection	-0.062 (0.186)	0.042 (0.165)	-0.007 (0.209)
New IP producers and developers	0.103 (0.173)	0.046 (0.132)	-0.093 (0.205)
ln GDP (mean)	0.238*** (0.066)	0.146** (0.049)	-0.163* (0.074)
ln GDPpc (mean)	0.315** (0.098)	0.104 (0.086)	-0.379*** (0.111)
ln Geographic distance (mean)	0.341*** (0.086)	0.028 (0.082)	-0.367*** (0.096)
Intercept	–	-4.403** (1.349)	11.44*** (1.586)
Model	m14bop	m14bzip Count Data (Stage 2)	m14bzip Zero Data (Stage 1)
Observations	573	573	573

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 57: Compliance per IPR Multilateral Coherence Agreements

Agreement	IPR Multilateral Coherence Commitments (strict, sum)	Compliance: 0	Compliance: 1	Share of Compliance
CBD	372	1	371	99.7%
Paris	851	6	845	99.3%
Berne	963	8	955	99.2%
PCT	789	9	780	98.9%
WIPO Convention	127	3	124	97.6%
UCC Geneva	86	3	83	96.5%
TRIPS	985	69	916	93.0%
Budapest	678	53	625	92.2%
Rome	835	68	767	91.9%
Nice	704	64	640	90.9%
IPPC	316	30	286	90.5%
UCC Paris	49	5	44	89.8%
Madrid Protocol	632	66	566	89.6%
Phonograms Geneva	267	33	234	87.6%
Nairobi	16	2	14	87.5%
WPPT	450	57	393	87.3%
WCT	466	73	393	84.3%
Strasbourg	153	24	129	84.3%
Locarno	133	21	112	84.2%
UPOV	730	141	589	80.7%
Hague	223	55	168	75.3%
EPC	230	57	173	75.2%
Madrid	348	109	239	68.7%
TLT	261	83	178	68.2%
Lisbon	14	5	9	64.3%
Singapore	11	4	7	63.6%
PLT	97	40	57	58.8%
Brussels	164	78	86	52.4%
Vienna	99	54	45	45.5%
Beijing	10	10	0	0.0%

Appendix 58: Effectiveness per IPR Multilateral Coherence Agreements

Agreement	IPR Multilateral Coherence Commitments (strict, sum)	Effectiveness: 0	Effectiveness: 1	Share of Effectiveness
Madrid Protocol	632	459	173	27.4%
PLT	97	77	20	20.6%
WPPT	450	371	79	17.6%
WCT	466	389	77	16.5%
Nairobi	16	14	2	12.5%
TLT	261	232	29	11.1%
Budapest	678	607	71	10.5%
Singapore	11	10	1	9.1%
Vienna	99	91	8	8.1%
Rome	835	775	60	7.2%
Lisbon	14	13	1	7.1%
Hague	223	208	15	6.7%
CBD	372	351	21	5.6%
Brussels	164	155	9	5.5%
EPC	230	220	10	4.3%
Nice	704	676	28	4.0%
Strasbourg	153	147	6	3.9%
UPOV	730	703	27	3.7%
Locarno	133	129	4	3.0%
PCT	789	767	22	2.8%
IPPC	316	312	4	1.3%
Phonograms Geneva	267	264	3	1.1%
TRIPS	985	977	8	0.8%
Berne	963	957	6	0.6%
Paris	851	847	4	0.5%
Madrid	348	348	0	0.0%
WIPO Convention	127	127	0	0.0%
UCC Geneva	86	86	0	0.0%
UCC Paris	49	49	0	0.0%
Beijing	10	10	0	0.0%

Appendix 59: Model Fit of Legal-Institutional Effects Analysis (AIC & BIC)

Models	AIC	df	BIC	df
m1_ols	332.289	10	394.181	10
m1_op	1770.91	9	1826.61	9
m1_p	7200.35	9	7256.06	9
m1_nb	7202.37	10	7264.26	10
m1_zip	7218.35	18	7329.76	18
m1_zinb	7220.36	19	7337.96	19
Models	**AIC**	**df**	**BIC**	**df**
m1.1_ols	233.094	10	294.986	10
m1.1_op	1690.4	9	1746.1	9
m1.1_p	7193.28	9	7248.99	9
m1.1_nb	7195.3	10	7257.19	10
m1.1_zip	7211.29	18	7322.69	18
m1.1_zinb	7213.28	19	7330.88	19
Models	**AIC**	**df**	**BIC**	**df**
m1.2_ols	308.627	10	370.519	10
m1.2_op	1755.64	9	1811.35	9
m1.2_p	7198.68	9	7254.38	9
m1.2_nb	7200.69	10	7262.59	10
m1.2_zip	7216.68	18	7328.09	18
m1.2_zinb	7218.69	19	7336.28	19
Models	**AIC**	**df**	**BIC**	**df**
m1.3_ols	339.188	10	401.081	10
m1.3_op	1777.94	9	1833.64	9
m1.3_p	7200.82	9	7256.52	9
m1.3_nb	7202.83	10	7264.72	10
m1.3_zip	7218.82	18	7330.22	18
m1.3_zinb	9666.14	19	9783.74	19
Models	**AIC**	**df**	**BIC**	**df**
m1.4_ols	342.833	10	404.726	10
m1.4_op	1792.05	9	1847.76	9
m1.4_p	7201.06	9	7256.76	9
m1.4_nb	7203.07	10	7264.96	10
m1.4_zip	7219.06	18	7330.47	18
m1.4_zinb	7221.06	19	7338.65	19
Models	**AIC**	**df**	**BIC**	**df**
m1.5_ols	341.076	10	402.969	10
m1.5_op	1788.29	9	1843.99	9
m1.5_p	7200.94	9	7256.64	9
m1.5_nb	7202.95	10	7264.85	10
m1.5_zip	7218.98	18	7330.39	18
m1.5_zinb	7220.94	19	7338.54	19
Models	**AIC**	**df**	**BIC**	**df**
m2ss_ols	4723.91	10	4774.84	10
m2ss_op	4016.51	30	4169.29	30
m2ss_p	4877.5	9	4923.34	9
m2ss_nb	4879.52	10	4930.45	10
m2ss_zip	4895.5	18	4987.17	18
m2ss_zinb	4897.54	19	4994.3	19
Models	**AIC**	**df**	**BIC**	**df**
m2ss.1_ols	6733.46	10	6784.39	10

m2ss.1_op	5594.86	30	5747.63	30
m2ss.1_p	6596.39	9	6642.22	9
m2ss.1_nb	6120.05	10	6170.98	10
m2ss.1_zip	6616.79	18	6708.46	18
m2ss.1_zinb	6138.06	19	6234.82	19
Models	**AIC**	**df**	**BIC**	**df**
m2ss.2_ols	6620.73	10	6671.66	10
m2ss.2_p	6317.82	9	6363.66	9
m2ss.2_nb	5985.92	10	6036.85	10
m2ss.2_zip	6356.74	18	6448.41	18
m2ss.2_zinb	6003.92	19	6100.68	19
Models	**AIC**	**df**	**BIC**	**df**
m2ss.3_ols	6737.33	10	6788.26	10
m2ss.3_op	5611.33	30	5764.11	30
m2ss.3_p	6605.7	9	6651.54	9
m2ss.3_nb	6128.84	10	6179.77	10
m2ss.3_zip	6640.6	18	6732.27	18
m2ss.3_zinb	6146.84	19	6243.6	19
Models	**AIC**	**df**	**BIC**	**df**
m2ss.4_ols	6514.58	10	6565.5	10
m2ss.4_p	6303.66	9	6349.5	9
m2ss.4_nb	6004.34	10	6055.26	10
m2ss.4_zip	6322.39	18	6414.06	18
m2ss.4_zinb	6022.34	19	6119.09	19
Models	**AIC**	**df**	**BIC**	**df**
m2ss.5_ols	6190.14	10	6241.07	10
m2ss.5_p	5853.69	9	5899.52	9
m2ss.5_nb	5750.32	10	5801.25	10
m2ss.5_zip	5891.52	18	5983.19	18
m2ss.5_zinb	5768.32	19	5865.08	19
Models	**AIC**	**df**	**BIC**	**df**
m2ssm_ols	-681.61	10	-630.68	10
m2ssm_op	4602.81	56	4887.99	56
m2ssm_p	Inf	9	Inf	9
m2ssm_nb	2350.11	10	2401.03	10
Models	**AIC**	**df**	**BIC**	**df**
m2ssm.1_ols	-720.33	10	-669.41	10
m2ssm.1_op	4606.16	56	4891.34	56
m2ssm.1_p	Inf	9	Inf	9
m2ssm.1_nb	2348.68	10	2399.61	10
Models	**AIC**	**df**	**BIC**	**df**
m2ssm.2_ols	-681.59	10	-630.66	10
m2ssm.2_op	4614.94	56	4900.12	56
m2ssm.2_p	Inf	9	Inf	9
m2ssm.2_nb	2350.11	10	2401.03	10
Models	**AIC**	**df**	**BIC**	**df**
m2ssm.3_ols	-684.66	10	-633.73	10
m2ssm.3_op	4619.75	56	4904.93	56
m2ssm.3_p	Inf	9	Inf	9
m2ssm.3_nb	2349.99	10	2400.92	10
Models	**AIC**	**df**	**BIC**	**df**
m2ssm.4_ols	-687.4	10	-636.47	10
m2ssm.4_op	4598.68	56	4883.86	56

m2ssm.4_p	Inf	9	Inf	9
m2ssm.4_nb	2349.9	10	2400.82	10
Models	**AIC**	**df**	**BIC**	**df**
m2ssm.5_ols	-685.26	10	-634.33	10
m2ssm.5_op	4619.08	56	4904.27	56
m2ssm.5_p	Inf	9	Inf	9
m2ssm.5_nb	2349.97	10	2400.9	10
Models	**AIC**	**df**	**BIC**	**df**
m2bs_ols	6849.79	10	6902.75	10
m2bs_p	6377.89	9	6425.55	9
m2bs_nb	6379.89	10	6432.85	10
m2bs_zip	6411.79	18	6507.11	18
m2bs_zinb	6397.91	19	6498.53	19
Models	**AIC**	**df**	**BIC**	**df**
m2bs.1_ols	8912	10	8964.96	10
m2bs.1_p	8782.65	9	8830.31	9
m2bs.1_nb	7938.09	10	7991.05	10
m2bs.1_zip	8814.88	18	8910.2	18
m2bs.1_zinb	7956.13	19	8056.75	19
Models	**AIC**	**df**	**BIC**	**df**
m2bs.2_ols	8918.26	10	8971.22	10
m2bs.2_p	8795.23	9	8842.89	9
m2bs.2_nb	7941.64	10	7994.6	10
m2bs.2_zip	8829.58	18	8924.9	18
m2bs.2_zinb	7959.64	19	8060.26	19
Models	**AIC**	**df**	**BIC**	**df**
m2bs.3_ols	8875.38	10	8928.34	10
m2bs.3_p	8720.06	9	8767.73	9
m2bs.3_nb	7906.59	10	7959.54	10
m2bs.3_zip	8754.54	18	8849.86	18
m2bs.3_zinb	8439.64	19	8540.26	19
Models	**AIC**	**df**	**BIC**	**df**
m2bs.4_ols	8793.95	10	8846.91	10
m2bs.4_p	8600.78	9	8648.44	9
m2bs.4_nb	7868.84	10	7921.8	10
m2bs.4_zip	8635.07	18	8730.4	18
m2bs.4_zinb	7886.86	19	7987.48	19
Models	**AIC**	**df**	**BIC**	**df**
m2bs.5_ols	8373.09	10	8426.04	10
m2bs.5_p	7814.48	9	7862.15	9
m2bs.5_nb	7488.62	10	7541.57	10
m2bs.5_zip	7848.11	18	7943.43	18
m2bs.5_zinb	7506.63	19	7607.25	19
Models	**AIC**	**df**	**BIC**	**df**
m2bsm_ols	-754.95	10	-701.99	10
m2bsm_op	8929.96	114	9533.67	114
m2bsm_p	Inf	9	Inf	9
m2bsm_nb	2867.97	10	2920.92	10
Models	**AIC**	**df**	**BIC**	**df**
m2bsm.1_ols	-724.68	10	-671.72	10
m2bsm.1_op	8945.34	114	9549.06	114
m2bsm.1_p	Inf	9	Inf	9
m2bsm.1_nb	2869.14	10	2922.1	10

Models	AIC	df	BIC	df
m2bsm.2_ols	-724.45	10	-671.49	10
m2bsm.2_op	8934.23	114	9537.95	114
m2bsm.2_p	Inf	9	Inf	9
m2bsm.2_nb	2869.18	10	2922.14	10
Models	**AIC**	**df**	**BIC**	**df**
m2bsm.3_ols	-710.07	10	-657.11	10
m2bsm.3_op	8964.97	114	9568.69	114
m2bsm.3_p	Inf	9	Inf	9
m2bsm.3_nb	2869.77	10	2922.73	10
Models	**AIC**	**df**	**BIC**	**df**
m2bsm.4_ols	-710.73	10	-657.77	10
m2bsm.4_op	8963.16	114	9566.87	114
m2bsm.4_p	Inf	9	Inf	9
m2bsm.4_nb	2869.74	10	2922.7	10
Models	**AIC**	**df**	**BIC**	**df**
m2bsm.5_ols	-750.52	10	-697.56	10
m2bsm.5_op	8936.5	114	9540.21	114
m2bsm.5_p	Inf	9	Inf	9
m2bsm.5_nb	2868.19	10	2921.15	10
Models	**AIC**	**df**	**BIC**	**df**
m3ss_ols	3143.81	10	3194.74	10
m3ss_p	2047.77	9	2093.6	9
m3ss_nb	1957.86	10	2008.79	10
Models	**AIC**	**df**	**BIC**	**df**
m3ss.1_ols	3201.38	10	3252.31	10
m3ss.1_op	1942.35	14	2013.65	14
m3ss.1_p	2108.8	9	2154.64	9
m3ss.1_nb	1997.23	10	2048.15	10
Models	**AIC**	**df**	**BIC**	**df**
m3ss.2_ols	3136.54	10	3187.46	10
m3ss.2_p	1933	9	1978.83	9
m3ss.2_nb	1890.77	10	1941.69	10
df	**AIC**	**df**	**BIC**	**df**
m3ss.3_ols	3210.72	10	3261.64	10
m3ss.3_p	2117	9	2162.84	9
m3ss.3_nb	2001.01	10	2051.94	10
Models	**AIC**	**df**	**BIC**	**df**
m3ss.4_ols	2953.5	10	3004.43	10
m3ss.4_p	1958.09	9	2003.92	9
m3ss.4_nb	1877.57	10	1928.49	10
Models	**AIC**	**df**	**BIC**	**df**
m3ss.5_ols	3208	10	3258.92	10
m3ss.5_p	2112.93	9	2158.77	9
m3ss.5_nb	1999.1	10	2050.02	10
Models	**AIC**	**df**	**BIC**	**df**
m3sm_ols	-1876.6	10	-1825.6	10
m3sm_p	Inf	9	Inf	9
m3sm_nb	445.017	10	495.943	10
Models	**AIC**	**df**	**BIC**	**df**
m3sm.1_ols	-1882.2	10	-1831.3	10
m3sm.1_p	Inf	9	Inf	9
m3sm.1_nb	443.694	10	494.62	10

Models	AIC	df	BIC	df
m3sm.2_ols	-1925.7	10	-1874.7	10
m3sm.2_p	Inf	9	Inf	9
m3sm.2_nb	429.872	10	480.798	10
Models	**AIC**	**df**	**BIC**	**df**
m3sm.4_ols	-1953.7	10	-1902.7	10
m3sm.4_p	Inf	9	Inf	9
m3sm.4_nb	436.233	10	487.159	10
Models	**AIC**	**df**	**BIC**	**df**
m3sm.5_ols	-1899.7	10	-1848.8	10
m3sm.5_p	Inf	9	Inf	9
m3sm.5_nb	439.608	10	490.534	10
Models	**AIC**	**df**	**BIC**	**df**
m3bs_ols	4246.12	10	4299.08	10
m3bs_p	2817.66	9	2865.33	9
m3bs_nb	2626.13	10	2679.09	10
Models	**AIC**	**df**	**BIC**	**df**
m3bs.1_ols	4284.33	10	4337.29	10
m3bs.1_p	2862.47	9	2910.13	9
m3bs.1_nb	2648.68	10	2701.64	10
Models	**AIC**	**df**	**BIC**	**df**
m3bs.2_ols	4209.96	10	4262.92	10
m3bs.2_p	2629.31	9	2676.97	9
m3bs.2_nb	2530.32	10	2583.28	10
Models	**AIC**	**df**	**BIC**	**df**
m3bs.3_ols	4278.33	10	4331.29	10
m3bs.3_p	2854.91	9	2902.57	9
m3bs.3_nb	2644.4	10	2697.36	10
Models	**AIC**	**df**	**BIC**	**df**
m3bs.4_ols	3980.22	10	4033.18	10
m3bs.4_p	2636.23	9	2683.89	9
m3bs.4_nb	2493.8	10	2546.76	10
Models	**AIC**	**df**	**BIC**	**df**
m3bs.5_ols	4265.66	10	4318.62	10
m3bs.5_p	2824.83	9	2872.49	9
m3bs.5_nb	2628.75	10	2681.71	10
Models	**AIC**	**df**	**BIC**	**df**
m3bm.1_ols	-2679.2	10	-2626.3	10
m3bm.1_p	Inf	9	Inf	9
m3bm.1_nb	519.669	10	572.626	10
Models	**AIC**	**df**	**BIC**	**df**
m3bm.2_ols	-2746.9	10	-2694	10
m3bm.2_p	Inf	9	Inf	9
m3bm.2_nb	499.184	10	552.141	10
Models	**AIC**	**df**	**BIC**	**df**
m3bm.3_ols	-2679.7	10	-2626.8	10
m3bm.3_p	Inf	9	Inf	9
m3bm.3_nb	519.537	10	572.494	10
Models	**AIC**	**df**	**BIC**	**df**
m3bm.4_ols	-2785.3	10	-2732.3	10
m3bm.4_p	Inf	9	Inf	9
m3bm.4_nb	509.379	10	562.336	10

Models	AIC	df	BIC	df
m3bm.5_ols	-2734.3	10	-2681.4	10
m3bm.5_p	Inf	9	Inf	9
m3bm.5_nb	509.335	10	562.292	10

Appendix 60: Descriptive Statistics for the Economic Effects Data – Binary & Additive Variables of Indexes

Variables	N	Min	Max	Median	Mean	Std.Dev.
Independent Variables						
Binary & Additive Variables of Indexes						
Index IPR general (sum)						
ipr_mentioned	3833	0.00	1.00	1.00	0.56	0.50
ipr_1_article	3833	0.00	1.00	1.00	0.52	0.50
ipr_more_than_1_article	3833	0.00	1.00	0.00	0.46	0.50
ipr_mfn	3833	0.00	1.00	0.00	0.16	0.37
ipr_nt	3833	0.00	1.00	0.00	0.10	0.30
ipr_as_investment	3833	0.00	1.00	0.00	0.08	0.27
ipr_investment_mfn	3833	0.00	1.00	0.00	0.06	0.24
ipr_investment_nt	3833	0.00	1.00	0.00	0.07	0.25
ipr_assistance_coop_coordination	3833	0.00	1.00	0.00	0.44	0.50
ipr_general_enforcement	3833	0.00	1.00	0.00	0.39	0.49
ipr_dispute_settlement_mechanism	3833	0.00	1.00	0.00	0.04	0.20
ipr_investment_dispute_settlement_mechanism	3833	0.00	1.00	0.00	0.07	0.25
ipr_investment_expropriation_exception	3833	0.00	1.00	0.00	0.05	0.22
ipr_implementation	3833	0.00	1.00	0.00	0.18	0.38
ipr_border_measures	3833	0.00	1.00	0.00	0.23	0.42
ipr_m_copyrights_related_rights	3833	0.00	1.00	0.00	0.37	0.48
ipr_m_trademarks	3833	0.00	1.00	0.00	0.39	0.49
ipr_m_geo_indications	3833	0.00	1.00	0.00	0.38	0.49
ipr_m_industrial_designs	3833	0.00	1.00	0.00	0.35	0.48
ipr_m_patents	3833	0.00	1.00	0.00	0.38	0.48
ipr_m_undisclosed_information	3833	0.00	1.00	0.00	0.32	0.47
ipr_m_layout_design_integ_circuits	3833	0.00	1.00	0.00	0.34	0.47
ipr_m_new_plant_varieties	3833	0.00	1.00	0.00	0.21	0.41
ipr_m_trad_knowledge_genetic_resources	3833	0.00	1.00	0.00	0.08	0.28
ipr_m_encrypted_program_carrying_satellite_signals	3833	0.00	1.00	0.00	0.04	0.19
ipr_m_domain_names	3833	0.00	1.00	0.00	0.01	0.12
Index IPR specific (sum)						
ipr_special_requirements_related_border_measures	3833	0.00	1.00	0.00	0.16	0.37
ipr_civil_administrative_procedures_remedies	3833	0.00	1.00	0.00	0.18	0.38
ipr_provisional_measure	3833	0.00	1.00	0.00	0.17	0.38
ipr_criminal_procedures_remedies	3833	0.00	1.00	0.00	0.13	0.34
ipr_service_provider_liability	3833	0.00	1.00	0.00	0.05	0.23
ipr_committee	3833	0.00	1.00	0.00	0.11	0.31
ipr_transparency	3833	0.00	1.00	0.00	0.08	0.27

Variables	N	Min	Max	Median	Mean	Std.Dev.
Index IPR specific (sum) (cont.)						
ipr_t_copyrights_related_rights	3833	0.00	1.00	0.00	0.14	0.34
ipr_t_trademarks	3833	0.00	1.00	0.00	0.18	0.38
ipr_t_geo_indications	3833	0.00	1.00	0.00	0.20	0.40
ipr_t_industrial_designs	3833	0.00	1.00	0.00	0.13	0.34
ipr_t_patents	3833	0.00	1.00	0.00	0.14	0.35
ipr_t_undisclosed_information	3833	0.00	1.00	0.00	0.06	0.25
ipr_t_layout_design_integ_circuits	3833	0.00	1.00	0.00	0.02	0.15
ipr_t_new_plant_varieties	3833	0.00	1.00	0.00	0.04	0.20
ipr_t_trad_knowledge_genetic_resources	3833	0.00	1.00	0.00	0.04	0.21
ipr_t_encrypted_program_carrying_satellite_signals	3833	0.00	1.00	0.00	0.02	0.14
ipr_t_domain_names	3833	0.00	1.00	0.00	0.01	0.11
Index IPR TRIPS-plus (sum)						
ipr_tripsplus_copyrights_related_rights	3833	0.00	3.00	0.00	0.19	0.59
ipr_tripsplus_trademarks	3833	0.00	5.00	0.00	0.21	0.67
ipr_tripsplus_geo_indications	3833	0.00	7.00	0.00	0.82	1.98
ipr_tripsplus_industrial_design	3833	0.00	1.00	0.00	0.12	0.33
ipr_tripsplus_patents	3833	0.00	6.00	0.00	0.21	0.71
ipr_tripsplus_undisclosed_information	3833	0.00	3.00	0.00	0.12	0.46
ipr_tripsplus_layout_design	3833	0.00	1.00	0.00	0.00	0.04
ipr_tripsplus_new_plant_varieties	3833	0.00	2.00	0.00	0.19	0.41
ipr_tripsplus_trad_knowledge_genetic_resources	3833	0.00	7.00	0.00	0.16	0.81
ipr_tripsplus_encrypted_program_carrying_satellite_signals	3833	0.00	1.00	0.00	0.02	0.14
ipr_tripsplus_domain_names	3833	0.00	1.00	0.00	0.01	0.11
ipr_tripsplus_enforcement	3833	0.00	21.00	0.00	1.89	5.06
ipr_tripsplus_exhaustion	3833	0.00	6.00	0.00	0.15	0.92

Appendix 61: Model Fit of Economic Effect Analysis (AIC & BIC)

Models	AIC	df	BIC	df
m1_df10l_gi	1427.84	10	1468.547	10
m1_df10l_si	1432.096	10	1472.804	10
m1_df10l_ti	1432.199	10	1472.906	10
Models	**AIC**	**df**	**BIC**	**df**
m1_dft_gi	-448.8307	10	-401.7743	10
m1_dft_si	-451.4926	10	-404.4362	10
m1_dft_ti	-450.7723	10	-403.7159	10
Models	**AIC**	**df**	**BIC**	**df**
m1_fc_df_gi	906.115	10	954.3913	10
m1_fc_df_si	904.0196	10	952.2959	10
m1_fc_df_ti	909.488	10	957.7643	10
Models	**AIC**	**df**	**BIC**	**df**
m1_fc_df3l_gi	1552.09	10	1598.476	10
m1_fc_df3l_si	1555.384	10	1601.77	10
m1_fc_df3l_ti	1555.539	10	1601.925	10
Models	**AIC**	**df**	**BIC**	**df**
m1_fc_df5l_gi	400.3407	10	445.6203	10
m1_fc_df5l_si	402.8941	10	448.1737	10
m1_fc_df5l_ti	404.9234	10	450.2029	10
Models	**AIC**	**df**	**BIC**	**df**
m1_fc_dft_gi	-454.7744	10	-407.718	10
m1_fc_dft_si	-452.0178	10	-404.9614	10
m1_fc_dft_ti	-449.4861	10	-402.4297	10
Models	**AIC**	**df**	**BIC**	**df**
m1_bv_df_gi	921.8842	35	1090.8512	35
m1_bv_df_si	888.8078	27	1019.1538	27
m1_bv_df_ti	884.3723	22	990.5802	22
Models	**AIC**	**df**	**BIC**	**df**
m1_bv_df5l_gi	418.6607	34	572.6113	34
m1_bv_df5l_si	413.9678	27	536.2226	27
m1_bv_df5l_ti	404.3499	22	503.965	22
Models	**AIC**	**df**	**BIC**	**df**
m1_bv_df10l_gi	1435.315	34	1573.72	34
m1_bv_df10l_si	1454.329	22	1543.885	22
m1_bv_df10l_ti	1453.235	21	1538.72	21
Models	**AIC**	**df**	**BIC**	**df**
m1_bv_dft_gi	-458.8022	35	-294.1048	35
m1_bv_dft_si	-439.9058	27	-312.8536	27
m1_bv_dft_ti	-445.3561	22	-341.832	22
Models	**AIC**	**df**	**BIC**	**df**
m1_bv_fc_df_gi	943.338	34	1107.4774	34
m1_bv_fc_df_si	932.301	26	1057.8194	26
m1_bv_fc_df_ti	865.8497	21	967.2299	21
Models	**AIC**	**df**	**BIC**	**df**
m1_bv_fc_df5l_gi	401.2946	34	555.2452	34
m1_bv_fc_df5l_si	418.7462	26	536.4731	26
m1_bv_fc_df5l_ti	400.9655	21	496.0526	21
Models	**AIC**	**df**	**BIC**	**df**
m1_bv_fc_df10l_gi	1451.993	31	1578.186	31
m1_bv_fc_df10l_si	1448.659	19	1526.003	19

m1_bv_fc_df10l_ti	1451.923	20	1533.338	20
Models	**AIC**	**df**	**BIC**	**df**
m1_bv_fc_dft_gi	-485.987	34	-325.9953	34
m1_bv_fc_dft_si	-441.0506	26	-318.704	26
m1_bv_fc_dft_ti	-443.9896	21	-345.1711	21
Models	**AIC**	**df**	**BIC**	**df**
m2.2_df3l_gi	14703.78	10	14755.68	10
m2.2_df3l_si	14706.93	10	14758.83	10
m2.2_df3l_ti	14706.98	10	14758.88	10
Models	**AIC**	**df**	**BIC**	**df**
m2.2_dft_gi	9235.506	10	9287.629	10
m2.2_dft_si	9238.573	10	9290.696	10
m2.2_dft_ti	9238.61	10	9290.733	10
Models	**AIC**	**df**	**BIC**	**df**
m2.2_fc_df5l_gi	14358.1	10	14409.2	10
m2.2_fc_df5l_si	14361.69	10	14412.79	10
m2.2_fc_df5l_ti	14361.51	10	14412.61	10
Models	**AIC**	**df**	**BIC**	**df**
m2.2_bv_df_gi	10067.49	35	10254.42	35
m2.2_bv_df_si	10076.46	27	10220.66	27
m2.2_bv_df_ti	10073.79	22	10191.29	22
Models	**AIC**	**df**	**BIC**	**df**
m2.2_bv_df5l_gi	14392.04	35	14570.88	35
m2.2_bv_df5l_si	14393.48	27	14531.45	27
m2.2_bv_df5l_ti	14384.23	22	14496.65	22
Models	**AIC**	**df**	**BIC**	**df**
m2.2_bv_df10l_gi	13476.72	35	13646.36	35
m2.2_bv_df10l_si	13475.07	26	13601.09	26
m2.2_bv_df10l_ti	13467.17	22	13573.8	22
Models	**AIC**	**df**	**BIC**	**df**
m2.2_bv_dft_gi	9251.86	35	9434.291	35
m2.2_bv_dft_si	9255.965	27	9396.697	27
m2.2_bv_dft_ti	9254.555	22	9369.225	22
Models	**AIC**	**df**	**BIC**	**df**
m2.2_bv_fc_df_gi	10054.76	35	10241.68	35
m2.2_bv_fc_df_si	10089.3	27	10233.51	27
m2.2_bv_fc_df_ti	10078.54	22	10196.04	22
Models	**AIC**	**df**	**BIC**	**df**
m2.2_bv_fc_df5l_gi	14361.32	35	14540.16	35
m2.2_bv_fc_df5l_si	14394.98	27	14532.95	27
m2.2_bv_fc_df5l_ti	14385.06	22	14497.47	22
Models	**AIC**	**df**	**BIC**	**df**
m2.2_bv_fc_df10l_gi	13422.49	35	13592.14	35
m2.2_bv_fc_df10l_si	13473.54	25	13594.71	25
m2.2_bv_fc_df10l_ti	13467.63	22	13574.27	22
Models	**AIC**	**df**	**BIC**	**df**
m2.2_bv_fc_dft_gi	9242.367	35	9424.797	35
m2.2_bv_fc_dft_si	9269.12	27	9409.852	27
m2.2_bv_fc_dft_ti	9257.463	22	9372.134	22
Models	**AIC**	**df**	**BIC**	**df**
m3.1_df_gi	-391.2584	10	-344.5888	10
m3.1_df_si	-405.5308	10	-358.8612	10
m3.1_df_ti	-388.2295	10	-341.5599	10

Models	AIC	df	BIC	df
m3.1_df3l_gi	389.4852	10	434.0999	10
m3.1_df3l_si	384.6037	10	429.2184	10
m3.1_df3l_ti	386.2292	10	430.8439	10
Models	**AIC**	**df**	**BIC**	**df**
m3.1_df5l_gi	649.6676	10	693.3323	10
m3.1_df5l_si	653.8422	10	697.5069	10
m3.1_df5l_ti	655.6726	10	699.3373	10
Models	**AIC**	**df**	**BIC**	**df**
m3.1_dft_gi	-130.4502	10	-85.18523	10
m3.1_dft_si	-144.9588	10	-99.69389	10
m3.1_dft_ti	-141.5245	10	-96.25952	10
Models	**AIC**	**df**	**BIC**	**df**
m3.1_fc_df_gi	-363.2005	10	-316.5309	10
m3.1_fc_df_si	-373.0245	10	-326.3549	10
m3.1_fc_df_ti	-387.9492	10	-341.2797	10
Models	**AIC**	**df**	**BIC**	**df**
m3.1_fc_df3l_gi	395.8468	10	440.4615	10
m3.1_fc_df3l_si	389.7625	10	434.3772	10
m3.1_fc_df3l_ti	388.2802	10	432.8949	10
Models	**AIC**	**df**	**BIC**	**df**
m3.1_fc_df5l_gi	653.4016	10	697.0664	10
m3.1_fc_df5l_si	656.3158	10	699.9805	10
m3.1_fc_df5l_ti	655.7678	10	699.4325	10
Models	**AIC**	**df**	**BIC**	**df**
m3.1_fc_df10l_gi	693.0194	10	731.7968	10
m3.1_fc_df10l_si	696.4403	10	735.2177	10
m3.1_fc_df10l_ti	690.994	10	729.7713	10
Models	**AIC**	**df**	**BIC**	**df**
m3.1_fc_dft_gi	-126.526	10	-81.26105	10
m3.1_fc_dft_si	-127.8923	10	-82.62734	10
m3.1_fc_dft_ti	-131.0239	10	-85.75898	10
Models	**AIC**	**df**	**BIC**	**df**
m3.1_bv_df_gi	-379.3952	35	-216.0517	35
m3.1_bv_df_si	-388.831	27	-262.8231	27
m3.1_bv_df_ti	-389.756	22	-287.083	22
Models	**AIC**	**df**	**BIC**	**df**
m3.1_bv_df3l_gi	395.3075	34	546.9974	34
m3.1_bv_df3l_si	397.3648	27	517.8245	27
m3.1_bv_df3l_ti	392.7188	22	490.8711	22
Models	**AIC**	**df**	**BIC**	**df**
m3.1_bv_df5l_gi	670.7908	34	819.2507	34
m3.1_bv_df5l_si	658.8844	27	776.7791	27
m3.1_bv_df5l_ti	652.2341	22	748.2965	22
Models	**AIC**	**df**	**BIC**	**df**
m3.1_bv_df10l_gi	694.0824	33	822.0477	33
m3.1_bv_df10l_si	709.1134	22	794.4236	22
m3.1_bv_df10l_ti	700.2826	20	777.8374	20
Models	**AIC**	**df**	**BIC**	**df**
m3.1_bv_dft_gi	-133.5461	35	24.881212	35
m3.1_bv_dft_si	-118.3703	27	3.845058	27
m3.1_bv_dft_ti	-128.4866	22	-28.90371	22
Models	**AIC**	**df**	**BIC**	**df**

m3.1_bv_fc_df_gi	-435.904	34	-277.2275	34
m3.1_bv_fc_df_si	-359.8771	26	-238.5362	26
m3.1_bv_fc_df_ti	-385.0262	21	-287.0201	21
Models	**AIC**	**df**	**BIC**	**df**
m3.1_bv_fc_df3l_gi	395.1039	34	546.7938	34
m3.1_bv_fc_df3l_si	407.2764	25	518.8131	25
m3.1_bv_fc_df3l_ti	394.0922	21	487.7831	21
Models	**AIC**	**df**	**BIC**	**df**
m3.1_bv_fc_df5l_gi	661.4097	34	809.8697	34
m3.1_bv_fc_df5l_si	662.443	26	775.9712	26
m3.1_bv_fc_df5l_ti	645.4274	21	737.1232	21
Models	**AIC**	**df**	**BIC**	**df**
m3.1_bv_fc_df10l_gi	648.0386	28	756.6152	28
m3.1_bv_fc_df10l_si	669.0145	19	742.6915	19
m3.1_bv_fc_df10l_ti	691.2686	19	764.9456	19
Models	**AIC**	**df**	**BIC**	**df**
m3.1_bv_fc_dft_gi	-172.2427	34	-18.341922	34
m3.1_bv_fc_dft_si	-108.4596	26	9.229233	26
m3.1_bv_fc_dft_ti	-120.6552	21	-25.598789	21
Models	**AIC**	**df**	**BIC**	**df**
m3.3_df_gi	15517.07	10	15573.07	10
m3.3_df_si	15524.16	10	15580.16	10
m3.3_df_ti	15524.59	10	15580.59	10
Models	**AIC**	**df**	**BIC**	**df**
m3.3_df3l_gi	16340.58	10	16395.52	10
m3.3_df3l_si	16343.98	10	16398.92	10
m3.3_df3l_ti	16344.58	10	16399.52	10
Models	**AIC**	**df**	**BIC**	**df**
m3.3_df5l_gi	16977.86	10	17032.15	10
m3.3_df5l_si	16981.68	10	17035.97	10
m3.3_df5l_ti	16982.18	10	17036.47	10
Models	**AIC**	**df**	**BIC**	**df**
m3.3_df10l_gi	16248.23	10	16300.34	10
m3.3_df10l_si	16256.5	10	16308.6	10
m3.3_df10l_ti	16256.65	10	16308.75	10
Models	**AIC**	**df**	**BIC**	**df**
m3.3_dft_gi	15337.57	10	15392.61	10
m3.3_dft_si	15336.8	10	15391.83	10
m3.3_dft_ti	15335.79	10	15390.83	10
Models	**AIC**	**df**	**BIC**	**df**
m3.3_bv_df_gi	15510.31	35	15706.31	35
m3.3_bv_df_si	15554.99	27	15706.18	27
m3.3_bv_df_ti	15546.68	22	15669.88	22
Models	**AIC**	**df**	**BIC**	**df**
m3.3_bv_df3l_gi	16351.9	35	16544.19	35
m3.3_bv_df3l_si	16374.21	27	16522.55	27
m3.3_bv_df3l_ti	16365.38	22	16486.24	22
Models	**AIC**	**df**	**BIC**	**df**
m3.3_bv_df5l_gi	17001.97	35	17191.98	35
m3.3_bv_df5l_si	17010.25	27	17156.83	27
m3.3_bv_df5l_ti	17001.03	22	17120.46	22
Models	**AIC**	**df**	**BIC**	**df**
m3.3_bv_df10l_gi	16273.29	35	16455.64	35

m3.3_bv_df10l_si	16284.54	26	16420	26
m3.3_bv_df10l_ti	16278.16	22	16392.78	22
Models	**AIC**	**df**	**BIC**	**df**
m3.3_bv_dft_gi	15317.21	35	15509.82	35
m3.3_bv_dft_si	15354.36	27	15502.95	27
m3.3_bv_dft_ti	15336.24	22	15457.31	22
Models	**AIC**	**df**	**BIC**	**df**
m3.3_bv_fc_dft_gi	15376.88	35	15569.49	35
m3.3_bv_fc_dft_si	15353.12	27	15501.7	27
m3.3_bv_fc_dft_ti	15341.2	22	15462.27	22
Models	**AIC**	**df**	**BIC**	**df**
m3.4_df5l_gi	13121.27	10	13176.77	10
m3.4_df5l_si	13123.14	10	13178.64	10
m3.4_df5l_ti	13123.55	10	13179.05	10
Models	**AIC**	**df**	**BIC**	**df**
m3.4_df10l_gi	12823.85	10	12877.36	10
m3.4_df10l_si	12827	10	12880.51	10
m3.4_df10l_ti	12827.49	10	12881	10
Models	**AIC**	**df**	**BIC**	**df**
m3.4_bv_df10l_gi	12857.44	35	13044.73	35
m3.4_bv_df10l_si	12857.3	26	12996.43	26
m3.4_bv_df10l_ti	12850.4	22	12968.12	22
Models	**AIC**	**df**	**BIC**	**df**
m4.3_df5l_gi	3615.373	10	3657.638	10
m4.3_df5l_si	3612.691	10	3654.957	10
m4.3_df5l_ti	3613.007	10	3655.272	10
Models	**AIC**	**df**	**BIC**	**df**
m4.3_df10l_gi	2620.253	10	2659.142	10
m4.3_df10l_si	2613.223	10	2652.112	10
m4.3_df10l_ti	2610.729	10	2649.618	10
Models	**AIC**	**df**	**BIC**	**df**
m4.3_fc_df_gi	4444.021	10	4490.288	10
m4.3_fc_df_si	4442.662	10	4488.929	10
m4.3_fc_df_ti	4440.881	10	4487.148	10
Models	**AIC**	**df**	**BIC**	**df**
m4.3_fc_df10l_gi	2616.543	10	2655.432	10
m4.3_fc_df10l_si	2620.177	10	2659.066	10
m4.3_fc_df10l_ti	2620.32	10	2659.209	10
Models	**AIC**	**df**	**BIC**	**df**
m4.3_fc_dft_gi	4653.51	10	4694.148	10
m4.3_fc_dft_si	4660.114	10	4700.751	10
m4.3_fc_dft_ti	4660.608	10	4701.246	10
Models	**AIC**	**df**	**BIC**	**df**
m4.3_bv_df_gi	4360.512	34	4517.821	34
m4.3_bv_df_si	4343.871	27	4468.793	27
m4.3_bv_df_ti	4230.564	22	4332.352	22
Models	**AIC**	**df**	**BIC**	**df**
m4.3_bv_df3l_gi	3925.02	34	4072.652	34
m4.3_bv_df3l_si	3832.046	27	3949.283	27
m4.3_bv_df3l_ti	3810.244	22	3905.77	22
Models	**AIC**	**df**	**BIC**	**df**
m4.3_bv_df5l_gi	3557.162	34	3700.864	34
m4.3_bv_df5l_si	3398.734	27	3512.85	27

m4.3_bv_df5l_ti	3436.639	21	3525.396	21
Models	**AIC**	**df**	**BIC**	**df**
m4.3_bv_df10l_gi	2475.591	34	2607.813	34
m4.3_bv_df10l_si	2411.79	25	2509.012	25
m4.3_bv_df10l_ti	2477.035	20	2554.813	20
Models	**AIC**	**df**	**BIC**	**df**
m4.3_bv_dft_gi	4686.831	34	4825	34
m4.3_bv_dft_si	4670.265	27	4779.987	27
m4.3_bv_dft_ti	4669.781	22	4759.185	22
Models	**AIC**	**df**	**BIC**	**df**
m4.3_bv_fc_df_gi	4445.516	34	4602.825	34
m4.3_bv_fc_df_si	4428.813	27	4553.734	27
m4.3_bv_fc_df_ti	4431.918	22	4533.706	22
Models	**AIC**	**df**	**BIC**	**df**
m4.3_bv_fc_df3l_gi	4026.816	34	4174.448	34
m4.3_bv_fc_df3l_si	4021.602	27	4138.84	27
m4.3_bv_fc_df3l_ti	4015.098	22	4110.625	22
Models	**AIC**	**df**	**BIC**	**df**
m4.3_bv_fc_df5l_gi	3622.859	34	3766.561	34
m4.3_bv_fc_df5l_si	3623.555	27	3737.671	27
m4.3_bv_fc_df5l_ti	3621.844	22	3714.828	22
Models	**AIC**	**df**	**BIC**	**df**
m4.3_bv_fc_df10l_gi	2648.476	32	2772.92	32
m4.3_bv_fc_df10l_si	2639.99	23	2729.434	23
m4.3_bv_fc_df10l_ti	2636.169	21	2717.836	21
Models	**AIC**	**df**	**BIC**	**df**
m4.3_bv_fc_dft_gi	4659.145	22	4748.549	22
m4.3_bv_fc_dft_si	4645.737	23	4739.204	23
m4.3_bv_fc_dft_ti	4678.144	21	4763.483	21
Models	**AIC**	**df**	**BIC**	**df**
m4.4_df_gi	12812.54	10	12861.42	10
m4.4_df_si	12811.45	10	12860.32	10
m4.4_df_ti	12808.39	10	12857.26	10
Models	**AIC**	**df**	**BIC**	**df**
m4.4_df3l_gi	8873.096	10	8919.892	10
m4.4_df3l_si	8872.157	10	8918.953	10
m4.4_df3l_ti	8868.853	10	8915.649	10
Models	**AIC**	**df**	**BIC**	**df**
m4.4_df5l_gi	8651.723	10	8697.53	10
m4.4_df5l_si	8640.867	10	8686.673	10
m4.4_df5l_ti	8620.385	10	8666.191	10
Models	**AIC**	**df**	**BIC**	**df**
m4.4_df10l_gi	4857.044	10	4899.601	10
m4.4_df10l_si	4829.654	10	4872.212	10
m4.4_df10l_ti	4748.708	10	4791.266	10
Models	**AIC**	**df**	**BIC**	**df**
m4.4_dft_gi	8415.336	10	8459.665	10
m4.4_dft_si	8415.075	10	8459.404	10
m4.4_dft_ti	8414.15	10	8458.48	10
Models	**AIC**	**df**	**BIC**	**df**
m4.4_fc_df_gi	12811.99	10	12860.86	10
m4.4_fc_df_si	12811.72	10	12860.59	10
m4.4_fc_df_ti	12808.45	10	12857.32	10

Models	**AIC**	**df**	**BIC**	**df**
m4.4_fc_df3l_gi	8872.058	10	8918.853	10
m4.4_fc_df3l_si	8872.079	10	8918.875	10
m4.4_fc_df3l_ti	8867.571	10	8914.367	10
Models	**AIC**	**df**	**BIC**	**df**
m4.4_fc_df5l_gi	8650.785	10	8696.591	10
m4.4_fc_df5l_si	8650.421	10	8696.227	10
m4.4_fc_df5l_ti	8647.521	10	8693.327	10
Models	**AIC**	**df**	**BIC**	**df**
m4.4_bv_df_gi	12682.38	34	12848.55	34
m4.4_bv_df_si	12697.27	27	12829.24	27
m4.4_bv_df_ti	12633.49	22	12741.01	22
Models	**AIC**	**df**	**BIC**	**df**
m4.4_bv_df3l_gi	8767.369	34	8926.475	34
m4.4_bv_df3l_si	8783.646	27	8909.995	27
m4.4_bv_df3l_ti	8692.423	22	8795.374	22
Models	**AIC**	**df**	**BIC**	**df**
m4.4_bv_df5l_gi	8548.955	34	8704.697	34
m4.4_bv_df5l_si	8556.705	27	8680.383	27
m4.4_bv_df5l_ti	8479.269	22	8580.043	22
Models	**AIC**	**df**	**BIC**	**df**
m4.4_bv_df10l_gi	4677.045	34	4821.74	34
m4.4_bv_df10l_si	4615.125	25	4721.519	25
m4.4_bv_df10l_ti	4498.755	21	4588.126	21
Models	**AIC**	**df**	**BIC**	**df**
m4.4_bv_dft_gi	8270.862	34	8421.582	34
m4.4_bv_dft_si	8386.982	27	8506.671	27
m4.4_bv_dft_ti	8436.373	22	8533.897	22
Models	**AIC**	**df**	**BIC**	**df**
m4.4_bv_fc_df3l_gi	8910.814	34	9069.921	34
m4.4_bv_fc_df3l_si	8898.793	27	9025.142	27
m4.4_bv_fc_df3l_ti	8887.261	21	8985.53	21
Models	**AIC**	**df**	**BIC**	**df**
m4.4_bv_fc_df5l_gi	8691.948	34	8847.689	34
m4.4_bv_fc_df5l_si	8678.242	27	8801.919	27
m4.4_bv_fc_df5l_ti	8667.054	21	8763.247	21
Models	**AIC**	**df**	**BIC**	**df**
m4.4_bv_fc_df10l_gi	4889.575	33	5030.014	33
m4.4_bv_fc_df10l_si	4876.208	23	4974.09	23
m4.4_bv_fc_df10l_ti	4871.208	20	4956.32	20
Models	**AIC**	**df**	**BIC**	**df**
m4.5_df5l_gi	-9834.701	10	-9797.303	10
m4.5_df5l_si	-9833.756	10	-9796.358	10
m4.5_df5l_ti	-9836.481	10	-9799.084	10
Models	**AIC**	**df**	**BIC**	**df**
m4.5_df10l_gi	-6321.652	10	-6288.52	10
m4.5_df10l_si	-6321.475	10	-6288.343	10
m4.5_df10l_ti	-6326.706	10	-6293.574	10
Models	**AIC**	**df**	**BIC**	**df**
m4.5_dft_gi	-5878.647	10	-5846.607	10
m4.5_dft_si	-5875.583	10	-5843.543	10
m4.5_dft_ti	-5875.671	10	-5843.631	10
Models	**AIC**	**df**	**BIC**	**df**

m4.5_fc_df3l_gi	-9939.469	10	-9902.266	10
m4.5_fc_df3l_si	-9941.59	10	-9904.387	10
m4.5_fc_df3l_ti	-9938.588	10	-9901.385	10
Models	**AIC**	**df**	**BIC**	**df**
m4.5_bv_df_gi	3466.647	35	3621.857	35
m4.5_bv_df_si	3451.273	27	3571.006	27
m4.5_bv_df_ti	3442.966	22	3540.526	22
Models	**AIC**	**df**	**BIC**	**df**
m4.5_bv_df3l_gi	-9925.167	34	-9798.677	34
m4.5_bv_df3l_si	-9914.066	27	-9813.617	27
m4.5_bv_df3l_ti	-9921.366	22	-9839.519	22
Models	**AIC**	**df**	**BIC**	**df**
m4.5_bv_df5l_gi	-9811.683	34	-9684.53	34
m4.5_bv_df5l_si	-9811.795	27	-9710.82	27
m4.5_bv_df5l_ti	-9822.614	22	-9740.338	22
Models	**AIC**	**df**	**BIC**	**df**
m4.5_bv_df10l_gi	-6313.744	34	-6201.095	34
m4.5_bv_df10l_si	-6309.541	25	-6226.711	25
m4.5_bv_df10l_ti	-6320.516	22	-6247.625	22
Models	**AIC**	**df**	**BIC**	**df**
m4.5_bv_dft_gi	-5864.927	34	-5755.991	34
m4.5_bv_dft_si	-5847.882	27	-5761.374	27
m4.5_bv_dft_ti	-5854.135	22	-5783.647	22
Models	**AIC**	**df**	**BIC**	**df**
m4.5_bv_fc_df_gi	3456.41	34	3607.185	34
m4.5_bv_fc_df_si	3441.185	27	3560.918	27
m4.5_bv_fc_df_ti	3431.853	22	3529.413	22
Models	**AIC**	**df**	**BIC**	**df**
m4.5_bv_fc_df3l_gi	-10127.979	34	-10001.488	34
m4.5_bv_fc_df3l_si	-9915.26	27	-9814.812	27
m4.5_bv_fc_df3l_ti	-9922.466	22	-9840.619	22
Models	**AIC**	**df**	**BIC**	**df**
m4.5_bv_fc_df5l_gi	-10040.428	34	-9913.275	34
m4.5_bv_fc_df5l_si	-9809.668	27	-9708.694	27
m4.5_bv_fc_df5l_ti	-9818.884	22	-9736.609	22
Models	**AIC**	**df**	**BIC**	**df**
m4.5_bv_fc_df10l_gi	-6399.565	34	-6286.916	34
m4.5_bv_fc_df10l_si	-6318.177	25	-6235.347	25
m4.5_bv_fc_df10l_ti	-6321.635	22	-6248.745	22
Models	**AIC**	**df**	**BIC**	**df**
m4.5_bv_fc_dft_gi	-5861.717	26	-5778.413	26
m4.5_bv_fc_dft_si	-5855.426	23	-5781.733	23
m4.5_bv_fc_dft_ti	-5857.686	21	-5790.402	21
Models	**AIC**	**df**	**BIC**	**df**
m4.6_bv_df_gi	11203.56	35	11358.77	35
m4.6_bv_df_si	11198.84	27	11318.57	27
m4.6_bv_df_ti	11189.01	22	11286.57	22
Models	**AIC**	**df**	**BIC**	**df**
m4.6_bv_df3l_gi	-15677.64	35	-15527.37	35
m4.6_bv_df3l_si	-15684.53	27	-15568.6	27
m4.6_bv_df3l_ti	-15694.34	22	-15599.88	22
Models	**AIC**	**df**	**BIC**	**df**
m4.6_bv_df5l_gi	-14031.62	35	-13885.25	35

m4.6_bv_df5l_si	-14035.96	27	-13923.04	27
m4.6_bv_df5l_ti	-14045.66	22	-13953.65	22
Models	**AIC**	**df**	**BIC**	**df**
m4.7_df5l_gi	-16892.34	10	-16850.56	10
m4.7_df5l_si	-16907.19	10	-16865.41	10
m4.7_df5l_ti	-16901.11	10	-16859.34	10
Models	**AIC**	**df**	**BIC**	**df**
m4.7_dft_gi	-9955.568	10	-9919.256	10
m4.7_dft_si	-9956.531	10	-9920.219	10
m4.7_dft_ti	-9956.812	10	-9920.5	10
Models	**AIC**	**df**	**BIC**	**df**
m4.7_fc_df3l_gi	-17899.71	10	-17857.06	10
m4.7_fc_df3l_si	-17902.97	10	-17860.32	10
m4.7_fc_df3l_ti	-17903.13	10	-17860.48	10
Models	**AIC**	**df**	**BIC**	**df**
m4.7_fc_df5l_gi	-16895.26	10	-16853.48	10
m4.7_fc_df5l_si	-16904.11	10	-16862.33	10
m4.7_fc_df5l_ti	-16904.64	10	-16862.86	10
Models	**AIC**	**df**	**BIC**	**df**
m4.7_bv_df_gi	1028.287	35	1183.496	35
m4.7_bv_df_si	1029.442	27	1149.174	27
m4.7_bv_df_ti	1016.901	22	1114.461	22
Models	**AIC**	**df**	**BIC**	**df**
m4.7_bv_df5l_gi	-16891.95	35	-16745.72	35
m4.7_bv_df5l_si	-16879.29	27	-16766.48	27
m4.7_bv_df5l_ti	-16885.36	22	-16793.45	22
Models	**AIC**	**df**	**BIC**	**df**
m4.7_bv_dft_gi	-9921.106	34	-9797.645	34
m4.7_bv_dft_si	-9930.483	27	-9832.44	27
m4.7_bv_dft_ti	-9936.161	22	-9856.275	22
Models	**AIC**	**df**	**BIC**	**df**
m4.7_bv_fc_df_gi	1029.966	34	1180.741	34
m4.7_bv_fc_df_si	1026.547	27	1146.28	27
m4.7_bv_fc_df_ti	1016.191	22	1113.751	22
Models	**AIC**	**df**	**BIC**	**df**
m4.7_bv_fc_df5l_gi	-16982.01	34	-16839.96	34
m4.7_bv_fc_df5l_si	-16875.07	27	-16762.27	27
m4.7_bv_fc_df5l_ti	-16885.57	22	-16793.65	22
Models	**AIC**	**df**	**BIC**	**df**
m4.7_bv_fc_dft_gi	-9934.936	33	-9815.106	33
m4.7_bv_fc_dft_si	-9935.034	27	-9836.991	27
m4.7_bv_fc_dft_ti	-9944.329	22	-9864.442	22
Models	**AIC**	**df**	**BIC**	**df**
m4.8_bv_df_gi	10607.75	35	10752.5	35
m4.8_bv_df_si	10611.89	27	10723.55	27
m4.8_bv_df_ti	10612.09	22	10703.07	22
Models	**AIC**	**df**	**BIC**	**df**
m4.8_bv_fc_df_gi	10612.29	34	10752.9	34
m4.8_bv_fc_df_si	10627.37	27	10739.03	27
m4.8_bv_fc_df_ti	10617.92	22	10708.9	22
Models	**AIC**	**df**	**BIC**	**df**
m4.9_bv_df3l_gi	20975.39	35	21124	35
m4.9_bv_df3l_si	20965.12	27	21079.76	27

m4.9_bv_df3l_ti	20975.61	22	21069.02	22
Models	**AIC**	**df**	**BIC**	**df**
m4.9_bv_df5l_gi	18693.7	35	18838.75	35
m4.9_bv_df5l_si	18661.8	27	18773.69	27
m4.9_bv_df5l_ti	18689.18	22	18780.36	22
Models	**AIC**	**df**	**BIC**	**df**
m4.9_bv_dft_gi	23022.86	35	23175.32	35
m4.9_bv_dft_si	23012.77	27	23130.39	27
m4.9_bv_dft_ti	23026.75	22	23122.59	22
Models	**AIC**	**df**	**BIC**	**df**
m4.9_bv_fc_df5l_gi	18744.16	34	18885.07	34
m4.9_bv_fc_df5l_si	18730.16	27	18842.06	27
m4.9_bv_fc_df5l_ti	18699.56	22	18790.73	22
Models	**AIC**	**df**	**BIC**	**df**
m4.10_bv_df_gi	11262.14	35	11414.54	35
m4.10_bv_df_si	11291.17	27	11408.74	27
m4.10_bv_df_ti	11286.09	22	11381.89	22
Models	**AIC**	**df**	**BIC**	**df**
m4.10_bv_df3l_gi	17450.78	35	17599.59	35
m4.10_bv_df3l_si	17442.97	27	17557.77	27
m4.10_bv_df3l_ti	17436.05	22	17529.59	22
Models	**AIC**	**df**	**BIC**	**df**
m4.10_bv_dft_gi	18815.77	35	18968.42	35
m4.10_bv_dft_si	18817.87	27	18935.62	27
m4.10_bv_dft_ti	18811.81	22	18907.76	22
Models	**AIC**	**df**	**BIC**	**df**
m4.11_bv_df_gi	13401.22	35	13554.52	35
m4.11_bv_df_si	13410.68	27	13528.95	27
m4.11_bv_df_ti	13408.92	22	13505.29	22
Models	**AIC**	**df**	**BIC**	**df**
m4.11_bv_fc_df_gi	13406.27	34	13555.2	34
m4.11_bv_fc_df_si	13421.64	27	13539.9	27
m4.11_bv_fc_df_ti	13412.03	22	13508.39	22
Models	**AIC**	**df**	**BIC**	**df**
m4.12_df10l_gi	-10585.39	10	-10548.39	10
m4.12_df10l_si	-10582.2	10	-10545.2	10
m4.12_df10l_ti	-10582.17	10	-10545.16	10
Models	**AIC**	**df**	**BIC**	**df**
m4.12_dft_gi	-11173.66	10	-11136.99	10
m4.12_dft_si	-11174.97	10	-11138.3	10
m4.12_dft_ti	-11174.76	10	-11138.1	10
Models	**AIC**	**df**	**BIC**	**df**
m4.12_fc_df_gi	1068.067	10	1112.413	10
m4.12_fc_df_si	1070.874	10	1115.219	10
m4.12_fc_df_ti	1070.945	10	1115.291	10
Models	**AIC**	**df**	**BIC**	**df**
m4.12_fc_df3l_gi	-19772.79	10	-19730.02	10
m4.12_fc_df3l_si	-19775.49	10	-19732.73	10
m4.12_fc_df3l_ti	-19775.12	10	-19732.35	10
Models	**AIC**	**df**	**BIC**	**df**
m4.12_fc_df5l_gi	-19348.97	10	-19306.96	10
m4.12_fc_df5l_si	-19355.7	10	-19313.7	10
m4.12_fc_df5l_ti	-19352.23	10	-19310.22	10

Models	AIC	df	BIC	df
m4.12_fc_dft_gi	-11171.75	10	-11135.09	10
m4.12_fc_dft_si	-11181.03	10	-11144.37	10
m4.12_fc_dft_ti	-11179.59	10	-11142.92	10
Models	**AIC**	**df**	**BIC**	**df**
m4.12_bv_df_gi	1088.001	35	1243.211	35
m4.12_bv_df_si	1096.962	27	1216.695	27
m4.12_bv_df_ti	1083.716	22	1181.276	22
Models	**AIC**	**df**	**BIC**	**df**
m4.12_bv_df5l_gi	-19342.26	35	-19195.24	35
m4.12_bv_df5l_si	-19326.21	27	-19212.8	27
m4.12_bv_df5l_ti	-19333.84	22	-19241.43	22
Models	**AIC**	**df**	**BIC**	**df**
m4.12_bv_fc_df_gi	1099.139	34	1249.913	34
m4.12_bv_fc_df_si	1094.232	27	1213.964	27
m4.12_bv_fc_df_ti	1084.943	22	1182.503	22
Models	**AIC**	**df**	**BIC**	**df**
m4.12_bv_fc_df5l_gi	-19363.25	34	-19220.44	34
m4.12_bv_fc_df5l_si	-19327.04	27	-19213.62	27
m4.12_bv_fc_df5l_ti	-19334.41	22	-19242	22
Models	**AIC**	**df**	**BIC**	**df**
m4.12_bv_fc_dft_gi	-11200.78	33	-11079.79	33
m4.12_bv_fc_dft_si	-11152.92	27	-11053.93	27
m4.12_bv_fc_dft_ti	-11161.04	22	-11080.38	22
Models	**AIC**	**df**	**BIC**	**df**
m5.1_df_gi	1237.885	8	1285.856	8
m5.1_df_si	1199.411	8	1247.381	8
m5.1_df_ti	1185.949	8	1233.919	8
Models	**AIC**	**df**	**BIC**	**df**
m5.1_df3l_gi	5470.547	8	5517.942	8
m5.1_df3l_si	5417.791	8	5465.187	8
m5.1_df3l_ti	5424.354	8	5471.75	8
Models	**AIC**	**df**	**BIC**	**df**
m5.1_df5l_gi	8456.172	8	8503.24	8
m5.1_df5l_si	8437.901	8	8484.969	8
m5.1_df5l_ti	8445.022	8	8492.089	8
Models	**AIC**	**df**	**BIC**	**df**
m5.1_dft_gi	1926.627	8	1974.086	8
m5.1_dft_si	2000.669	8	2048.128	8
m5.1_dft_ti	2001.351	8	2048.81	8
Models	**AIC**	**df**	**BIC**	**df**
m5.1_fc_df_gi	1195.845	8	1243.816	8
m5.1_fc_df_si	1239.456	8	1287.426	8
m5.1_fc_df_ti	1237.27	8	1285.24	8
Models	**AIC**	**df**	**BIC**	**df**
m5.1_fc_df3l_gi	5374.379	8	5421.775	8
m5.1_fc_df3l_si	5469.335	8	5516.731	8
m5.1_fc_df3l_ti	5460.791	8	5508.186	8
Models	**AIC**	**df**	**BIC**	**df**
m5.1_fc_df5l_gi	8396.31	8	8443.377	8
m5.1_fc_df5l_si	8455.036	8	8502.104	8
m5.1_fc_df5l_ti	8452.408	8	8499.475	8
Models	**AIC**	**df**	**BIC**	**df**

m5.1_fc_df10l_gi	12228.33	8	12274.26	8
m5.1_fc_df10l_si	12236.17	8	12282.1	8
m5.1_fc_df10l_ti	12236.22	8	12282.15	8
Models	**AIC**	**df**	**BIC**	**df**
m5.1_fc_dft_gi	1933.286	8	1980.745	8
m5.1_fc_dft_si	1997.194	8	2044.653	8
m5.1_fc_dft_ti	1996.677	8	2044.135	8
Models	**AIC**	**df**	**BIC**	**df**
m5.1_bv_df_gi	1078.215	33	1276.093	33
m5.1_bv_df_si	1175.114	25	1325.022	25
m5.1_bv_df_ti	1162.24	20	1282.167	20
Models	**AIC**	**df**	**BIC**	**df**
m5.1_bv_df3l_gi	5325.476	33	5520.982	33
m5.1_bv_df3l_si	5421.955	25	5570.066	25
m5.1_bv_df3l_ti	5423.77	20	5542.259	20
Models	**AIC**	**df**	**BIC**	**df**
m5.1_bv_df5l_gi	8393.48	33	8587.634	33
m5.1_bv_df5l_si	8455.215	25	8602.301	25
m5.1_bv_df5l_ti	8452.287	20	8569.956	20
Models	**AIC**	**df**	**BIC**	**df**
m5.1_bv_df10l_gi	12270.81	33	12460.27	33
m5.1_bv_df10l_si	12264.65	24	12402.44	24
m5.1_bv_df10l_ti	12256.88	20	12371.7	20
Models	**AIC**	**df**	**BIC**	**df**
m5.1_bv_dft_gi	1717.786	33	1913.554	33
m5.1_bv_dft_si	1992.187	25	2140.496	25
m5.1_bv_dft_ti	1984.319	20	2102.966	20
Models	**AIC**	**df**	**BIC**	**df**
m5.1_bv_fc_df_gi	922.131	33	1120.009	33
m5.1_bv_fc_df_si	1245.272	25	1395.18	25
m5.1_bv_fc_df_ti	1232.298	20	1352.224	20
Models	**AIC**	**df**	**BIC**	**df**
m5.1_bv_fc_df3l_gi	5262.637	33	5458.144	33
m5.1_bv_fc_df3l_si	5482.099	25	5630.21	25
m5.1_bv_fc_df3l_ti	5450.003	20	5568.492	20
Models	**AIC**	**df**	**BIC**	**df**
m5.1_bv_fc_df5l_gi	8337.631	33	8531.785	33
m5.1_bv_fc_df5l_si	8471.925	25	8619.012	25
m5.1_bv_fc_df5l_ti	8463.955	20	8581.624	20
Models	**AIC**	**df**	**BIC**	**df**
m5.1_bv_fc_df10l_gi	12260.09	33	12449.55	33
m5.1_bv_fc_df10l_si	12266.48	24	12404.27	24
m5.1_bv_fc_df10l_ti	12257.4	20	12372.22	20
Models	**AIC**	**df**	**BIC**	**df**
m5.1_bv_fc_dft_gi	1705.663	33	1901.431	33
m5.1_bv_fc_dft_si	2001.34	25	2149.649	25
m5.1_bv_fc_dft_ti	1993.657	20	2112.305	20
Models	**AIC**	**df**	**BIC**	**df**
m5.2_df_gi	792.0778	8	840.0484	8
m5.2_df_si	759.1076	8	807.0782	8
m5.2_df_ti	743.1731	8	791.1436	8
Models	**AIC**	**df**	**BIC**	**df**
m5.2_df3l_gi	4696.488	8	4743.884	8

m5.2_df3l_si	4642.001	8	4689.397	8
m5.2_df3l_ti	4647.694	8	4695.089	8
Models	**AIC**	**df**	**BIC**	**df**
m5.2_df5l_gi	7169.042	8	7216.109	8
m5.2_df5l_si	7145.893	8	7192.961	8
m5.2_df5l_ti	7154.527	8	7201.595	8
Models	**AIC**	**df**	**BIC**	**df**
m5.2_dft_gi	1577.669	8	1625.128	8
m5.2_dft_si	1655.578	8	1703.037	8
m5.2_dft_ti	1655.802	8	1703.261	8
Models	**AIC**	**df**	**BIC**	**df**
m5.2_fc_df_gi	756.7521	8	804.7226	8
m5.2_fc_df_si	795.2528	8	843.2233	8
m5.2_fc_df_ti	793.5133	8	841.4838	8
Models	**AIC**	**df**	**BIC**	**df**
m5.2_fc_df3l_gi	4609.485	8	4656.881	8
m5.2_fc_df3l_si	4695.999	8	4743.394	8
m5.2_fc_df3l_ti	4686.61	8	4734.006	8
Models	**AIC**	**df**	**BIC**	**df**
m5.2_fc_df5l_gi	7110.178	8	7157.246	8
m5.2_fc_df5l_si	7167.977	8	7215.044	8
m5.2_fc_df5l_ti	7164.375	8	7211.442	8
Models	**AIC**	**df**	**BIC**	**df**
m5.2_fc_df10l_gi	9809.371	8	9855.296	8
m5.2_fc_df10l_si	9819.95	8	9865.875	8
m5.2_fc_df10l_ti	9820.061	8	9865.986	8
Models	**AIC**	**df**	**BIC**	**df**
m5.2_fc_dft_gi	1597.294	8	1644.753	8
m5.2_fc_dft_si	1653.262	8	1700.721	8
m5.2_fc_dft_ti	1653.03	8	1700.489	8
Models	**AIC**	**df**	**BIC**	**df**
m5.2_bv_df_gi	633.7339	33	831.6124	33
m5.2_bv_df_si	730.6541	25	880.5621	25
m5.2_bv_df_ti	720.1682	20	840.0946	20
Models	**AIC**	**df**	**BIC**	**df**
m5.2_bv_df3l_gi	4533.469	33	4728.976	33
m5.2_bv_df3l_si	4643.393	25	4791.504	25
m5.2_bv_df3l_ti	4648.016	20	4766.504	20
Models	**AIC**	**df**	**BIC**	**df**
m5.2_bv_df5l_gi	7075.124	33	7269.278	33
m5.2_bv_df5l_si	7158.475	25	7305.561	25
m5.2_bv_df5l_ti	7157.753	20	7275.422	20
Models	**AIC**	**df**	**BIC**	**df**
m5.2_bv_df10l_gi	9838.259	33	10027.701	33
m5.2_bv_df10l_si	9843.339	24	9981.115	24
m5.2_bv_df10l_ti	9835.937	20	9950.75	20
Models	**AIC**	**df**	**BIC**	**df**
m5.2_bv_dft_gi	1370.04	33	1565.808	33
m5.2_bv_dft_si	1651.866	25	1800.175	25
m5.2_bv_dft_ti	1645.965	20	1764.612	20
Models	**AIC**	**df**	**BIC**	**df**
m5.2_bv_fc_df_gi	502.0754	33	699.9538	33
m5.2_bv_fc_df_si	800.9625	25	950.8704	25

m5.2_bv_fc_df_ti	789.4731	20	909.3994	20
Models	**AIC**	**df**	**BIC**	**df**
m5.2_bv_fc_df3l_gi	4512.283	33	4707.789	33
m5.2_bv_fc_df3l_si	4709.697	25	4857.808	25
m5.2_bv_fc_df3l_ti	4676.01	20	4794.499	20
Models	**AIC**	**df**	**BIC**	**df**
m5.2_bv_fc_df5l_gi	7048.966	33	7243.12	33
m5.2_bv_fc_df5l_si	7180.946	25	7328.032	25
m5.2_bv_fc_df5l_ti	7172.778	20	7290.447	20
Models	**AIC**	**df**	**BIC**	**df**
m5.2_bv_fc_df10l_gi	9827.616	33	10017.058	33
m5.2_bv_fc_df10l_si	9848.181	24	9985.957	24
m5.2_bv_fc_df10l_ti	9837.17	20	9951.984	20
Models	**AIC**	**df**	**BIC**	**df**
m5.2_bv_fc_dft_gi	1386.307	33	1582.075	33
m5.2_bv_fc_dft_si	1661.556	25	1809.865	25
m5.2_bv_fc_dft_ti	1654.033	20	1772.68	20
Models	**AIC**	**df**	**BIC**	**df**
m5.3_df5l_gi	22584.51	8	22631.24	8
m5.3_df5l_si	22588.56	8	22635.3	8
m5.3_df5l_ti	22588.48	8	22635.21	8
Models	**AIC**	**df**	**BIC**	**df**
m5.3_bv_df_gi	22265.62	33	22462.3	33
m5.3_bv_df_si	22269.19	25	22418.19	25
m5.3_bv_df_ti	22258.49	20	22377.69	20
Models	**AIC**	**df**	**BIC**	**df**
m5.3_bv_df5l_gi	22618.92	33	22811.69	33
m5.3_bv_df5l_si	22618.67	25	22764.71	25
m5.3_bv_df5l_ti	22609.98	20	22726.81	20
Models	**AIC**	**df**	**BIC**	**df**
m5.3_bv_dft_gi	22085.75	33	22280.29	33
m5.3_bv_dft_si	22086.97	25	22234.34	25
m5.3_bv_dft_ti	22079.8	20	22197.7	20
Models	**AIC**	**df**	**BIC**	**df**
m5.3_bv_fc_df_gi	22280.04	33	22476.72	33
m5.3_bv_fc_df_si	22260.06	25	22409.05	25
m5.3_bv_fc_df_ti	22260.15	20	22379.35	20
Models	**AIC**	**df**	**BIC**	**df**
m5.3_bv_fc_dft_gi	22095.58	33	22290.12	33
m5.3_bv_fc_dft_si	22080.99	25	22228.37	25
m5.3_bv_fc_dft_ti	22077.09	20	22194.99	20
Models	**AIC**	**df**	**BIC**	**df**
m5.4_bv_df3l_gi	22663.64	33	22857.89	33
m5.4_bv_df3l_si	22635.07	25	22782.23	25
m5.4_bv_df3l_ti	22627.18	20	22744.91	20
Models	**AIC**	**df**	**BIC**	**df**
m5.4_bv_fc_df3l_gi	22627.36	33	22821.61	33
m5.4_bv_fc_df3l_si	22651.46	25	22798.62	25
m5.4_bv_fc_df3l_ti	22640.86	20	22758.59	20

Appendix 62: Economic Effect Regression Tables of the Binary Variables for IPR General

Investment in R&D I	Overall IPR			
	df	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables				
ipr_mentioned	-0.012 (0.069)	-0.028 (0.066)	0.116 (0.277)	-0.008 (0.032)
ipr_1_article	-0.019 (0.076)	0.099 (0.07)	0.365 (0.489)	-0.027 (0.035)
ipr_more_than_1_article	0.026 (0.064)	-0.041 (0.059)	-0.606 (0.489)	0.03 (0.03)
ipr_mfn	0.161*** (0.047)	0.085 (0.055)	0.773** (0.285)	0.046. (0.026)
ipr_nt	-0.099 (0.06)	0 (0.071)	-0.502 (0.479)	-0.056. (0.03)
ipr_as_investment	0.131 (0.246)	0.147 (0.223)	-0.024 (1.802)	0.058 (0.113)
ipr_investment_mfn	0 (0.122)	-0.089 (0.124)	0.507 (0.792)	0.008 (0.056)
ipr_investment_nt	-0.127 (0.278)	NA	NA	-0.113 (0.128)
ipr_assistance_coop_coordination	0.033 (0.05)	-0.045 (0.048)	-0.523. (0.268)	0.05* (0.023)
ipr_general_enforcement	0.042 (0.049)	0.034 (0.045)	0.344 (0.229)	0.008 (0.023)
ipr_dispute_settlement_mechanism	0.029 (0.056)	0.112. (0.067)	0.071 (0.549)	0.047 (0.033)
ipr_investment_dispute_settle-ment_mechanism	-0.03 (0.176)	-0.123 (0.187)	-0.054 (1.561)	-0.009 (0.081)
ipr_investment_expropriation_exception	0.01 (0.103)	-0.048 (0.109)	-0.281 (0.854)	-0.002 (0.047)
ipr_implementation	-0.026 (0.038)	0.062. (0.035)	0.761*** (0.185)	-0.031. (0.018)
ipr_border_measures	-0.19*** (0.051)	-0.07 (0.059)	-0.326 (0.397)	-0.006 (0.028)
ipr_m_copyrights_related_rights	-0.043 (0.088)	-0.267** (0.101)	-0.17 (0.747)	-0.032 (0.047)
ipr_m_trademarks	0.069 (0.132)	0.388** (0.137)	-0.141 (0.916)	0.017 (0.062)
ipr_m_geo_indications	0.015 (0.081)	-0.127 (0.081)	0.476 (0.434)	-0.03 (0.037)
ipr_m_industrial_designs	-0.117 (0.131)	-0.111 (0.122)	0.094 (0.753)	-0.031 (0.061)
ipr_m_patents	0.004 (0.124)	0.098 (0.126)	0.215 (0.7)	0.036 (0.057)
ipr_m_undisclosed_information	-0.061 (0.066)	0.043 (0.092)	0.177 (0.616)	-0.035 (0.039)
ipr_m_layout_design_integ_circuits	0.073 (0.09)	-0.037 (0.095)	-0.469 (0.823)	0.052 (0.042)

ipr_m_new_plant_varieties	0.121** (0.045)	-0.007 (0.049)	0.665** (0.241)	-0.011 (0.024)
ipr_m_trad_knowledge_genetic_resources	-0.019 (0.057)	0.06 (0.068)	0.225 (0.796)	0.002 (0.029)
ipr_m_encrypted_program_carrying_satellite_signals	0.128 (0.079)	0.073 (0.073)	0.455 (0.851)	0.146*** (0.037)
ipr_m_domain_names	0.026 (0.157)	-0.169 (0.159)	0.088 (1.006)	-0.052 (0.075)
Control Variables				
Democratisation (Polity 2) (mean)	-0.006. (0.003)	0.008* (0.003)	-0.032. (0.018)	0.002 (0.002)
Classic IP leaders	0.162*** (0.047)	0.188*** (0.05)	0.357 (0.254)	0.041. (0.022)
Countries with a high increase of patent protection	0.005 (0.042)	0.036 (0.038)	0.314 (0.192)	-0.026 (0.019)
New IP producers and developers	0.065 (0.041)	0.186*** (0.046)	-0.033 (0.308)	0.047* (0.019)
ln GDP	-0.006 (0.009)	0.002 (0.009)	-0.099* (0.048)	0.001 (0.005)
ln GDPpc	-0.035* (0.018)	-0.081*** (0.018)	-0.084 (0.105)	-0.023** (0.009)
ln Geographic distance (mean)	0.029 (0.02)	0.036. (0.021)	-0.249* (0.101)	0.035*** (0.009)
Intercept	0.266 (0.236)	0.389 (0.255)	5.301*** (1.332)	-0.077 (0.113)
Model	m1_bv_df_gi	1_bv_df5l_gi	m1_bv_df10l_gi	m1_bv_dft_gi
Observations	923	684	433	817

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Investment in R&D II	First-comer IPR		
	df5l	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables			
ipr_mentioned	-0.081 (0.108)	-0.733 (0.473)	-0.024 (0.057)
ipr_1_article	0.218. (0.119)	0.902 (0.623)	0.043 (0.064)
ipr_more_than_1_article	-0.204 (0.153)	-0.566 (0.731)	-0.01 (0.083)
ipr_mfn	0.108 (0.154)	-0.011 (0.996)	-0.028 (0.07)
ipr_nt	-0.134 (0.115)	-0.665 (0.552)	-0.034 (0.036)
ipr_as_investment	0.269 (0.385)	0.142 (1.3)	-0.051 (0.143)
ipr_investment_mfn	0.295 (0.199)	-0.201 (1.421)	0.035 (0.109)
ipr_investment_nt	NA	NA	NA
ipr_assistance_coop_coordination	-0.193 (0.136)	-0.887 (0.664)	0.031 (0.067)
ipr_general_enforcement	-0.533** (0.175)	-0.769 (1.557)	-0.108 (0.084)
ipr_dispute_settlement_mechanism	0.048 (0.069)	-0.031 (0.338)	0.011 (0.038)
ipr_investment_dispute_settle-ment_mechanism	-0.657* (0.326)	NA	-0.029 (0.097)
ipr_investment_expropriation_exception	0.355** (0.135)	0.342 (0.738)	0.007 (0.067)
ipr_implementation	0.202** (0.077)	-0.138 (0.459)	-0.078. (0.044)
ipr_border_measures	0.241* (0.113)	-0.455 (2.187)	-0.019 (0.052)
ipr_m_copyrights_related_rights	-0.137 (0.167)	0.137 (1.074)	0.012 (0.078)
ipr_m_trademarks	0.16 (0.225)	1.825 (1.999)	-0.147 (0.093)
ipr_m_geo_indications	-0.145 (0.224)	0.947 (2.561)	0.202. (0.113)
ipr_m_industrial_designs	-0.504. (0.257)	-2.789 (2.597)	-0.485*** (0.104)
ipr_m_patents	0.462. (0.259)	NA	0.153 (0.11)
ipr_m_undisclosed_information	0.486* (0.232)	0.763 (3.04)	-0.032 (0.097)
ipr_m_layout_design_integ_circuits	-0.182 (0.137)	NA	0.252*** (0.071)
ipr_m_new_plant_varieties	0.05 (0.079)	1.463** (0.455)	0.057 (0.039)
ipr_m_trad_knowledge_genetic_re-sources	0.018 (0.059)	0.759 (0.737)	0.056 (0.042)

ipr_m_encrypted_program_carrying_satellite_signals	0.125 (0.095)	-0.139 (1.308)	0.266*** (0.051)
ipr_m_domain_names	-0.19 (0.207)	-0.247 (0.891)	0.064 (0.079)
Control Variables			
Democratisation (Polity 2) (mean)	0.003 (0.003)	-0.04* (0.019)	0.001 (0.002)
Classic IP leaders	0.21*** (0.046)	0.142 (0.242)	0.033. (0.02)
Countries with a high increase of patent protection	0.032 (0.034)	0.078 (0.184)	-0.028 (0.018)
New IP producers and developers	0.167*** (0.043)	-0.17 (0.318)	0.016 (0.018)
ln GDP	0.007 (0.009)	-0.063 (0.048)	0.003 (0.004)
ln GDPpc	-0.085*** (0.018)	0.005 (0.106)	-0.014. (0.009)
ln Geographic distance (mean)	0.013 (0.019)	-0.202* (0.097)	0.017* (0.008)
Intercept	0.513* (0.236)	3.677** (1.257)	-0.049 (0.106)
Model	m1_bv_fc_df5l_gi	m1_bv_fc_df10l_gi	m1_bv_fc_dft_gi
Observations	684	433	817

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Licensing I	Overall IPR			
	df	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables				
ipr_mentioned	2.439** (0.821)	-10.717 (11.794)	167.133*** (46.59)	2.673** (0.955)
ipr_1_article	-2.467** (0.921)	-6.011 (13.097)	-156.224** (58.123)	-2.479* (1.07)
ipr_more_than_1_article	0.881 (0.829)	8.299 (12.36)	25.295 (56.761)	0.819 (0.972)
ipr_mfn	0.835 (0.638)	4.541 (11.745)	-14.875 (51.173)	0.644 (0.865)
ipr_nt	1.159 (0.805)	-5.823 (15.25)	-11.299 (75.059)	1.158 (1.025)
ipr_as_investment	-4.614. (2.508)	-36.173 (36.23)	-129.778 (202.37)	-5.741* (2.917)
ipr_investment_mfn	0.651 (1.543)	-5.489 (23.549)	-14.807 (137.741)	0.735 (1.837)
ipr_investment_nt	2.62 (3.201)	39.984 (47.126)	118.982 (287.018)	3.555 (3.755)
ipr_assistance_coop_coordination	-0.688 (0.67)	2.727 (9.842)	-54.045 (49.066)	-0.591 (0.788)
ipr_general_enforcement	0.952 (0.703)	1.933 (10.547)	10.126 (41.32)	1.199 (0.826)
ipr_dispute_settlement_mechanism	-0.709 (0.878)	-5.306 (16.48)	-46.888 (88.07)	-0.499 (1.038)
ipr_investment_dispute_settle-ment_mechanism	0.455 (1.811)	-4.115 (30.654)	0.576 (156.468)	0.382 (2.11)
ipr_investment_expropriation_exception	1.072 (1.224)	-4.299 (21.58)	13.388 (121.818)	0.817 (1.501)
ipr_implementation	0.24 (0.51)	-8.459 (8.082)	7.893 (34.836)	-0.62 (0.632)
ipr_border_measures	-1.366* (0.613)	-13.805 (11.611)	31.497 (55.766)	-0.953 (0.842)
ipr_m_copyrights_related_rights	-0.672 (1.049)	-6.697 (20.288)	-8.686 (90.904)	-0.82 (1.386)
ipr_m_trademarks	-1.375 (1.198)	5.876 (26.821)	-23.261 (112.063)	-1.794 (1.551)
ipr_m_geo_indications	0.205 (0.988)	1.008 (15.546)	-33.929 (69.85)	0.199 (1.179)
ipr_m_industrial_designs	2.599. (1.464)	16.699 (22.276)	30.336 (92.894)	3.045. (1.758)
ipr_m_patents	0.817 (1.307)	22.526 (21.657)	-41.775 (86.522)	1.124 (1.528)
ipr_m_undisclosed_information	0.245 (0.776)	13.65 (16.547)	69.268 (80.745)	1.008 (1.253)
ipr_m_layout_design_integ_circuits	-2.609* (1.191)	-58.323** (18.287)	21.854 (85.376)	-2.439. (1.4)
ipr_m_new_plant_varieties	0.247 (0.6)	12.311 (10.719)	-10.543 (44.661)	-0.811 (0.811)

ipr_m_trad_knowledge_genetic_re-sources	-0.407 (0.652)	14.094 (13.825)	101.922 (95.075)	-0.024 (0.909)
ipr_m_encrypted_program_carrying_sat-ellite_signals	1.795. (0.928)	2.716 (15.283)	-3.244 (83.426)	1.996. (1.113)
ipr_m_domain_names	-1.398 (1.899)	1.311 (32.279)	131.502 (151.36)	-1.35 (2.258)
Control Variables				
Democratisation (Polity 2) (mean)	-0.13** (0.048)	0.383 (0.718)	-6.89* (2.992)	-0.105. (0.056)
Classic IP leaders	-0.1 (0.486)	-10.608 (7.176)	-15.912 (28.979)	-0.473 (0.579)
Countries with a high increase of patent protection	-0.083 (0.448)	19.211** (6.308)	29.321 (27.042)	-0.178 (0.524)
New IP producers and developers	-0.044 (0.47)	-4.481 (6.656)	-38.16 (35.97)	0.124 (0.552)
ln GDP	-0.272* (0.118)	-5.85** (1.815)	-7.762 (7.841)	-0.301* (0.146)
ln GDPpc	0.09 (0.214)	10.756*** (3.226)	6.293 (14.523)	0.008 (0.259)
ln Geographic distance (mean)	0.124 (0.238)	2.561 (3.547)	-5.283 (14.986)	-0.042 (0.285)
Intercept	7.097* (2.917)	51.861 (45.442)	253.273 (194.356)	9.733** (3.579)
Model	m2.2_bv_df_gi	m2.2_bv_df5l_gi	m2.2_bv_df10l_gi	m2.2_bv_dft_gi
Observations	1542	1224	941	1356

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Licensing II	First-comer IPR			
	df	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables				
ipr_mentioned	9.353*** (1.507)	-61.303** (21.166)	741.187*** (88.481)	9.503*** (1.752)
ipr_1_article	-6.49*** (1.656)	42.783. (23.316)	-574.481*** (93.606)	-7.069*** (1.921)
ipr_more_than_1_article	-0.919 (2.097)	14.804 (31.084)	-47.473 (126.471)	-1.024 (2.46)
ipr_mfn	-1.421 (1.552)	-32.713 (24.681)	42.362 (99.88)	-1.178 (1.81)
ipr_nt	2.096. (1.123)	-14.16 (23.838)	-73.074 (99.202)	2.081 (1.314)
ipr_as_investment	-7.639* (3.723)	-7.328 (52.711)	-300.962 (206.982)	-8.022. (4.327)
ipr_investment_mfn	-1.266 (2.612)	4.236 (36.754)	-132.948 (161.116)	-1.282 (3.089)
ipr_investment_nt	8.891. (5.109)	-29.19 (70.678)	520.841. (309.764)	10.145. (5.931)
ipr_assistance_coop_coordination	-4.919** (1.509)	28.586 (21.464)	-481.111*** (104.399)	-5.178** (1.774)
ipr_general_enforcement	1.895 (2.073)	11.515 (30.595)	199.762 (138.782)	2.514 (2.433)
ipr_dispute_settlement_mechanism	-0.385 (1.34)	-0.626 (19.513)	-26.473 (82.927)	-0.884 (1.56)
ipr_investment_dispute_settle-ment_mechanism	-1.411 (2.594)	13.962 (36.36)	-124.354 (185.087)	-1.885 (3.044)
ipr_investment_expropriation_exception	0.847 (1.415)	-17.219 (23.938)	19.613 (134.778)	0.921 (1.893)
ipr_implementation	-0.083 (1.009)	-5.19 (15.246)	74.178 (66.095)	-0.167 (1.257)
ipr_border_measures	-1.928 (1.262)	-1.151 (19.973)	-54.097 (104.411)	-3.782* (1.625)
ipr_m_copyrights_related_rights	0.241 (2.157)	32.649 (31.225)	97.745 (130.244)	0.055 (2.538)
ipr_m_trademarks	-1.359 (2.594)	-16.239 (37.11)	-103.933 (160.515)	-1.479 (3.029)
ipr_m_geo_indications	0.821 (2.419)	23.938 (36.857)	-26.291 (170.564)	1.202 (2.831)
ipr_m_industrial_designs	0.862 (2.438)	34.642 (37.459)	316.471 (195.705)	0.653 (2.872)
ipr_m_patents	1.102 (2.632)	16.521 (37.455)	-193.657 (189.154)	1.741 (3.068)
ipr_m_undisclosed_information	1.345 (2.148)	28.393 (36.677)	172.756 (179.076)	0.675 (2.553)
ipr_m_layout_design_integ_circuits	-0.656 (1.663)	-136.141*** (28.978)	11.912 (150.761)	-0.102 (1.994)
ipr_m_new_plant_varieties	1.826. (1.078)	29.92. (16.447)	-50.949 (67.195)	1.763 (1.272)

ipr_m_trad_knowledge_genetic_resources	-0.705 (0.905)	14.844 (13.392)	101.275 (98.973)	-0.72 (1.426)
ipr_m_encrypted_program_carrying_satellite_signals	1.207 (1.388)	-1.445 (20.628)	18.026 (114.423)	3.852* (1.674)
ipr_m_domain_names	-0.541 (2.422)	3.417 (34.238)	4.531 (152.727)	-1.258 (2.867)
Control Variables				
Democratisation (Polity 2) (mean)	-0.12* (0.047)	0.529 (0.703)	-5.629* (2.868)	-0.097. (0.055)
Classic IP leaders	-0.284 (0.452)	-13.949* (6.809)	-4.571 (28.016)	-0.539 (0.545)
Countries with a high increase of patent protection	-0.221 (0.436)	21.952*** (6.095)	34.892 (25.576)	-0.331 (0.51)
New IP producers and developers	-0.286 (0.448)	-3.297 (6.307)	-43.605 (32.877)	-0.203 (0.521)
ln GDP	-0.241* (0.113)	-4.929** (1.737)	-7.738 (7.362)	-0.295* (0.141)
ln GDPpc	0.093 (0.198)	8.704** (2.964)	14.21 (12.605)	0.154 (0.241)
ln Geographic distance (mean)	0.134 (0.22)	2.335 (3.306)	-6.987 (14.082)	-0.154 (0.26)
Intercept	6.427* (2.698)	39.935 (41.692)	185.556 (180.08)	9.726** (3.274)
Model	m2.2_bv_fc_df_gi	m2.2_bv_fc_df5l_gi	m2.2_bv_fc_df10l_gi	m2.2_bv_fc_dft_gi
Observations	1542	1224	941	1356

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Innovation: Researchers in R&D I	Overall IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables					
ipr_mentioned	-0.015 (0.04)	-0.12 (0.075)	-0.114 (0.103)	-0.102 (0.17)	-0.015 (0.046)
ipr_1_article	0.033 (0.042)	0.003 (0.077)	0.106 (0.107)	0.339 (0.383)	0.032 (0.049)
ipr_more_than_1_article	-0.018 (0.034)	0.018 (0.065)	-0.009 (0.091)	-0.35 (0.38)	-0.026 (0.041)
ipr_mfn	0.042. (0.024)	0.094. (0.056)	0.083 (0.077)	0.153 (0.159)	0.022 (0.033)
ipr_nt	-0.034 (0.03)	0.056 (0.069)	0.099 (0.098)	0.167 (0.266)	-0.08* (0.038)
ipr_as_investment	0.112 (0.232)	-0.115 (0.204)	-0.173 (0.301)	-0.636 (0.465)	0.001 (0.268)
ipr_investment_mfn	-0.051 (0.065)	-0.286* (0.119)	-0.101 (0.173)	0.319 (0.442)	-0.032 (0.076)
ipr_investment_nt	-0.12 (0.206)	NA	NA	NA	-0.116 (0.237)
ipr_assistance_coop_coordination	-0.026 (0.027)	-0.02 (0.05)	-0.118. (0.07)	0.037 (0.168)	-0.023 (0.031)
ipr_general_enforcement	0.041 (0.025)	0.038 (0.047)	0.07 (0.064)	0.131 (0.127)	0.049 (0.03)
ipr_dispute_settlement_mechanism	0.003 (0.029)	-0.069 (0.069)	-0.11 (0.092)	-0.654. (0.349)	0.008 (0.042)
ipr_investment_dispute_settle-ment_mechanism	-0.003 (0.092)	0.244 (0.172)	0.208 (0.252)	NA	0.046 (0.106)
ipr_investment_expropriation_exception	-0.051 (0.053)	0.021 (0.111)	-0.063 (0.156)	0.289 (0.602)	-0.01 (0.061)
ipr_implementation	-0.014 (0.019)	0.084* (0.036)	0.048 (0.05)	0.224* (0.102)	-0.025 (0.023)
ipr_border_measures	-0.037 (0.026)	-0.042 (0.061)	-0.054 (0.084)	0.035 (0.224)	0.08* (0.036)
ipr_m_copyrights_related_rights	0.03 (0.045)	0.007 (0.114)	-0.051 (0.156)	-0.601 (0.553)	0.15* (0.064)
ipr_m_trademarks	-0.11 (0.071)	-0.11 (0.148)	0.121 (0.208)	0.417 (0.619)	-0.227** (0.086)
ipr_m_geo_indications	-0.019 (0.042)	0.077 (0.08)	-0.106 (0.118)	-0.571* (0.284)	-0.016 (0.049)
ipr_m_industrial_designs	-0.048 (0.073)	0.064 (0.141)	0.068 (0.19)	0.224 (0.441)	0.006 (0.087)
ipr_m_patents	0.122. (0.069)	0.08 (0.147)	0.03 (0.194)	0.208 (0.376)	0.131 (0.08)
ipr_m_undisclosed_information	-0.025 (0.033)	-0.071 (0.103)	0.019 (0.139)	1.092** (0.386)	-0.078 (0.052)
ipr_m_layout_design_integ_circuits	0.013 (0.057)	-0.134 (0.113)	-0.203 (0.157)	-1.084. (0.593)	0.038 (0.065)
ipr_m_new_plant_varieties	0.004 (0.023)	-0.031 (0.05)	-0.057 (0.068)	0.11 (0.129)	-0.035 (0.031)

ipr_m_trad_knowledge_genetic_re-sources	-0.066* (0.029)	-0.073 (0.067)	0.015 (0.097)	0.719 (0.53)	-0.091* (0.038)
ipr_m_encrypted_program_carrying_sat-ellite_signals	-0.006 (0.039)	-0.028 (0.074)	-0.04 (0.098)	-0.556 (0.537)	-0.02 (0.046)
ipr_m_domain_names	-0.052 (0.081)	0.069 (0.163)	0.141 (0.221)	0.973 (0.614)	-0.04 (0.099)
Control Variables					
Democratisation (Polity 2) (mean)	0.003 (0.002)	0 (0.005)	0.017** (0.007)	-0.02 (0.016)	0.003 (0.003)
Classic IP leaders	0.042. (0.025)	0.16** (0.05)	0.176* (0.072)	0.036 (0.154)	0.035 (0.031)
Countries with a high increase of patent protection	-0.033 (0.023)	-0.019 (0.042)	-0.025 (0.056)	-0.004 (0.115)	-0.041 (0.026)
New IP producers and developers	0.056** (0.021)	0.061 (0.042)	0.307*** (0.069)	-0.02 (0.21)	0.054* (0.026)
ln GDP	-0.001 (0.005)	-0.012 (0.01)	-0.011 (0.013)	-0.039 (0.027)	-0.004 (0.006)
ln GDPpc	-0.021* (0.01)	-0.092*** (0.02)	-0.1*** (0.029)	-0.05 (0.069)	-0.026* (0.013)
ln Geographic distance (mean)	0.055*** (0.011)	0.066** (0.022)	0.06. (0.033)	0.119. (0.061)	0.05*** (0.013)
Intercept	-0.133 (0.131)	0.94*** (0.271)	0.962* (0.385)	1.485. (0.798)	0.036 (0.161)
Model	m3.1_bv_df_gi	m3.1_bv_df3l_gi	m3.1_bv_df5l_gi	m3.1_bv_df10l_gi	m3.1_bv_dft_gi
Observations	786	640	582	357	683

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Innovation: Researchers in R&D II	First-comer IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables					
ipr_mentioned	-0.316** (0.102)	-0.107 (0.173)	0.04 (0.225)	-1.266** (0.438)	-0.282* (0.12)
ipr_1_article	0.242* (0.105)	0.077 (0.188)	0.189 (0.244)	2.062*** (0.578)	0.223. (0.125)
ipr_more_than_1_article	0.115 (0.145)	0.031 (0.255)	-0.159 (0.314)	-0.58 (0.655)	0.156 (0.175)
ipr_mfn	0.039 (0.074)	0.002 (0.159)	-0.01 (0.209)	0.095 (0.462)	0.022 (0.088)
ipr_nt	-0.058 (0.039)	0.084 (0.133)	-0.092 (0.19)	-0.402 (0.34)	-0.077. (0.045)
ipr_as_investment	-0.218 (0.178)	-0.491 (0.312)	-0.251 (0.556)	0.246 (0.808)	-0.146 (0.209)
ipr_investment_mfn	-0.048 (0.156)	-0.05 (0.229)	-0.035 (0.282)	-1.253 (0.888)	-0.063 (0.184)
ipr_investment_nt	NA	NA	NA	NA	NA
ipr_assistance_coop_coordination	-0.136 (0.087)	-0.107 (0.165)	0.142 (0.221)	2.639*** (0.543)	-0.212* (0.106)
ipr_general_enforcement	0.022 (0.118)	-0.379. (0.209)	0.113 (0.285)	-0.438 (0.891)	-0.012 (0.148)
ipr_dispute_settlement_mechanism	0.019 (0.04)	-0.027 (0.071)	-0.078 (0.091)	-0.026 (0.159)	-0.019 (0.046)
ipr_investment_dispute_settle-ment_mechanism	0.239* (0.111)	0.342 (0.239)	-0.147 (0.49)	NA	0.165 (0.131)
ipr_investment_expropriation_exception	-0.057 (0.078)	0.092 (0.136)	-0.323. (0.186)	-3.497*** (0.68)	-0.062 (0.093)
ipr_implementation	-0.117** (0.043)	-0.186* (0.083)	-0.189. (0.108)	-0.504* (0.214)	-0.126* (0.057)
ipr_border_measures	0.003 (0.06)	0.004 (0.122)	-0.024 (0.166)	NA	0.071 (0.073)
ipr_m_copyrights_related_rights	0.26* (0.104)	0.34 (0.279)	-0.242 (0.387)	-8.242*** (1.742)	0.203 (0.126)
ipr_m_trademarks	-0.666*** (0.108)	-0.561* (0.24)	-0.698* (0.318)	4.76*** (1.051)	-0.718*** (0.128)
ipr_m_geo_indications	0.686*** (0.161)	0.878** (0.298)	0.97** (0.368)	0.844 (1.49)	0.625*** (0.188)
ipr_m_industrial_designs	-0.097 (0.127)	-0.685** (0.239)	-0.371 (0.381)	NA	-0.339* (0.153)
ipr_m_patents	-0.09 (0.118)	-0.123 (0.239)	-0.052 (0.377)	NA	0.139 (0.15)
ipr_m_undisclosed_information	-0.092 (0.116)	0.092 (0.332)	-0.149 (0.479)	NA	0.056 (0.147)
ipr_m_layout_design_integ_circuits	0.14 (0.092)	0.348* (0.17)	0.523* (0.225)	NA	0.22* (0.108)
ipr_m_new_plant_varieties	-0.007 (0.044)	-0.004 (0.088)	-0.282* (0.118)	0.112 (0.237)	-0.022 (0.051)
ipr_m_trad_knowledge_genetic_re-sources	-0.054. (0.032)	-0.076 (0.059)	-0.099 (0.082)	0.753. (0.417)	0.034 (0.057)

ipr_m_encrypted_program_carrying_satellite_signals	-0.008 (0.053)	-0.071 (0.095)	-0.12 (0.126)	-0.846 (0.654)	0.103 (0.063)
ipr_m_domain_names	-0.118 (0.088)	-0.077 (0.222)	0.644* (0.274)	3.124*** (0.545)	0.039 (0.12)
Control Variables					
Democratisation (Polity 2) (mean)	0.001 (0.002)	-0.006 (0.005)	0.015* (0.007)	-0.044** (0.017)	0.003 (0.003)
Classic IP leaders	-0.002 (0.022)	0.071 (0.046)	0.108 (0.069)	0.024 (0.134)	0 (0.027)
Countries with a high increase of patent protection	-0.015 (0.02)	-0.007 (0.039)	-0.015 (0.051)	-0.135 (0.101)	-0.028 (0.024)
New IP producers and developers	0.018 (0.02)	0.014 (0.039)	0.318*** (0.066)	-0.197 (0.207)	0.021 (0.023)
ln GDP	0 (0.005)	-0.006 (0.01)	0.003 (0.013)	-0.027 (0.025)	-0.002 (0.006)
ln GDPpc	-0.005 (0.01)	-0.063** (0.021)	-0.107*** (0.03)	-0.018 (0.063)	-0.001 (0.013)
ln Geographic distance (mean)	0.019* (0.009)	0.052** (0.019)	0.072* (0.028)	0.127* (0.056)	0.011 (0.011)
Intercept	-0.016 (0.118)	0.624* (0.251)	0.55 (0.356)	1.004 (0.706)	0.06 (0.147)
Model	m3.1_bv_fc_df_gi	m3.1_bv_fc_df3l_gi	m3.1_bv_fc_df5l_gi	m3.1_bv_fc_df10l_gi	m3.1_bv_fc_dft_gi
Observations	786	640	582	357	683

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Innovation: Resident Applications for Industrial Designs I	Overall IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables					
ipr_mentioned	4.467*** (1.346)	4.046 (2.659)	4.035 (4.46)	-6.461 (12.542)	2.751 (1.905)
ipr_1_article	-6.849*** (1.462)	-9.435** (2.865)	-11.265* (4.789)	-2.188 (14.68)	-5.913** (2.061)
ipr_more_than_1_article	0.09 (1.265)	2.406 (2.499)	3.25 (4.292)	-18.112 (13.826)	2.349 (1.785)
ipr_mfn	-0.613 (1.036)	-0.796 (2.402)	-1.01 (4.203)	1.201 (12.774)	-1.496 (1.643)
ipr_nt	1.957 (1.311)	2.214 (2.908)	1.464 (5.508)	4.386 (18.662)	3.013 (1.981)
ipr_as_investment	-6.733 (4.104)	-12.997 (8.083)	-18.245 (13.372)	-67.957 (50.049)	-8.949 (5.789)
ipr_investment_mfn	2.152 (2.699)	2.986 (5.629)	3.964 (9.629)	40.683 (41.122)	1.774 (3.883)
ipr_investment_nt	4.084 (5.536)	NA	11.641 (18.859)	19.84 (79.609)	3.942 (7.848)
ipr_assistance_coop_coordination	5.589*** (1.045)	9.784*** (2.086)	13.278*** (3.565)	47.467*** (12.03)	8.863*** (1.491)
ipr_general_enforcement	-1.445 (1.067)	-2.471 (2.155)	-4.559 (3.663)	-17.231. (10.312)	-4.565** (1.507)
ipr_dispute_settlement_mechanism	-2.254 (1.388)	-5.342. (2.804)	-11.284* (5.711)	-3.406 (21.581)	-4.817* (1.982)
ipr_investment_dispute_settle-ment_mechanism	0.145 (3.316)	0.477 (7.077)	-0.146 (12.966)	-9.488 (47.764)	0.567 (4.673)
ipr_investment_expropriation_exception	-1.3 (2.068)	-3.19 (4.738)	-3.104 (8.309)	-10.27 (31.332)	-0.203 (3.029)
ipr_implementation	-0.246 (0.8)	-1.949 (1.669)	-3.298 (2.887)	-11.225 (8.9)	-3.055* (1.192)
ipr_border_measures	-0.521 (0.996)	-2.889 (2.348)	-3.931 (4.204)	-9.475 (13.885)	0.152 (1.593)
ipr_m_copyrights_related_rights	-0.933 (1.658)	-2.798 (3.864)	-0.472 (7.054)	-8.851 (21.446)	2.958 (2.606)
ipr_m_trademarks	-1.708 (1.946)	3.21 (5.654)	1.086 (9.756)	7.872 (29.321)	-2.018 (3.044)
ipr_m_geo_indications	-0.67 (1.53)	-0.93 (3.168)	0.05 (5.46)	9.361 (17.828)	-2.933 (2.204)
ipr_m_industrial_designs	0.192 (2.292)	1.561 (4.727)	2.857 (7.92)	-12.345 (23.21)	4.843 (3.302)
ipr_m_patents	0.262 (2.077)	-2.712 (4.484)	0.254 (7.819)	17.967 (22.704)	-1.624 (2.934)
ipr_m_undisclosed_information	-0.901 (1.291)	-2.895 (2.936)	-6.138 (6.049)	-24.405 (19.888)	-4.951* (2.393)
ipr_m_layout_design_integ_circuits	0.742 (1.786)	-1.253 (3.567)	-5.184 (6.233)	-9.571 (21.471)	2.28 (2.518)
ipr_m_new_plant_varieties	0.172 (0.965)	-1.076 (2.202)	-1.295 (3.938)	-5.215 (11.67)	-2.604. (1.555)

ipr_m_trad_knowledge_genetic_resources	-0.053 (1.082)	3.058 (2.683)	3.377 (5.164)	3.718 (24.846)	0.534 (1.776)
ipr_m_encrypted_program_carrying_satellite_signals	0.549 (1.497)	2.166 (3.149)	3.158 (5.622)	23.499 (20.821)	0.854 (2.157)
ipr_m_domain_names	2.489 (3.032)	4.288 (6.487)	5.961 (11.613)	-15.999 (38.222)	4.989 (4.356)
Control Variables					
Democratisation (Polity 2) (mean)	-0.025 (0.064)	-0.288* (0.128)	-0.628** (0.215)	-1.709** (0.65)	-0.029 (0.09)
Classic IP leaders	0.002 (0.851)	2.124 (1.748)	3.571 (2.988)	11.684 (8.78)	1.229 (1.22)
Countries with a high increase of patent protection	-1.024 (0.646)	-1.194 (1.285)	-1.816 (2.139)	-16.155* (6.815)	-0.676 (0.914)
New IP producers and developers	1.256 (0.764)	2.78. (1.52)	5.929* (2.537)	46.858*** (9.831)	1.27 (1.085)
ln GDP	0.058 (0.181)	-0.179 (0.37)	-0.494 (0.629)	-2.414 (1.884)	-0.364 (0.266)
ln GDPpc	0.181 (0.316)	0.882 (0.643)	2.018. (1.089)	7.16* (3.365)	0.909* (0.458)
ln Geographic distance (mean)	-0.546 (0.379)	-1.01 (0.775)	-1.54 (1.319)	-3.186 (3.984)	-0.765 (0.548)
Intercept	3.061 (4.506)	10.591 (9.255)	17.86 (15.9)	54.6 (49.353)	9.093 (6.556)
Model	m3.3_bv_df_gi	m3.3_bv_df3l_gi	m3.3_bv_df5l_gi	m3.3_bv_df10l_gi	m3.3_bv_dft_gi
Observations	1998	1797	1684	1353	1814

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Innovation: Resident Applications for Industrial Designs II	FC IPR *dft*
Variables	Estimates (Std. Error)
IPR General Binary Variables	
ipr_mentioned	-2.388 (3.262)
ipr_1_article	1.315 (3.269)
ipr_more_than_1_article	1.755 (4.323)
ipr_mfn	1.978 (3.182)
ipr_nt	-5.077. (2.701)
ipr_as_investment	4.684 (8.131)
ipr_investment_mfn	-2.412 (6.475)
ipr_investment_nt	-5.03 (11.877)
ipr_assistance_coop_coordination	-2.678 (3.064)
ipr_general_enforcement	0.339 (4.342)
ipr_dispute_settlement_mechanism	-3.147 (2.981)
ipr_investment_dispute_settle-ment_mechanism	2.377 (6.588)
ipr_investment_expropriation_exception	0.356 (3.577)
ipr_implementation	-1.977 (2.386)
ipr_border_measures	4.626 (3.258)
ipr_m_copyrights_related_rights	1.117 (4.32)
ipr_m_trademarks	-0.516 (5.692)
ipr_m_geo_indications	-1.699 (4.753)
ipr_m_industrial_designs	0.995 (5.07)
ipr_m_patents	-0.124 (5.72)
ipr_m_undisclosed_information	0.675 (4.836)
ipr_m_layout_design_integ_circuits	0.584 (3.557)
ipr_m_new_plant_varieties	-1.952 (2.358)

ipr_m_trad_knowledge_genetic_resources	-0.662 (2.624)
ipr_m_encrypted_program_carrying_satellite_signals	3.662 (3.218)
ipr_m_domain_names	-2.243 (4.903)
Control Variables	
Democratisation (Polity 2) (mean)	-0.064 (0.09)
Classic IP leaders	1.991. (1.145)
Countries with a high increase of patent protection	-0.174 (0.895)
New IP producers and developers	0.243 (1.051)
ln GDP	-0.406 (0.268)
ln GDPpc	0.907. (0.47)
ln Geographic distance (mean)	-1.298* (0.522)
Intercept	14.248* (6.265)
Model	m3.3_bv_fc_dft_gi
Observations	1814

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Innovation: Resident Applications for Patents	Overall IPR *df*
Variables	Estimates (Std. Error)
IPR General Binary Variables	
ipr_mentioned	-0.321 (1.773)
ipr_1_article	-0.996 (2.115)
ipr_more_than_1_article	-2.126 (2.009)
ipr_mfn	0.064 (1.811)
ipr_nt	-1.391 (2.715)
ipr_as_investment	-14.297* (6.359)
ipr_investment_mfn	3.808 (6.165)
ipr_investment_nt	10.137 (11.009)
ipr_assistance_coop_coordination	3.501* (1.758)
ipr_general_enforcement	0.454 (1.533)
ipr_dispute_settlement_mechanism	0.331 (3.187)
ipr_investment_dispute_settle-ment_mechanism	-2.331 (6.658)
ipr_investment_expropriation_exception	-0.028 (4.615)
ipr_implementation	-0.794 (1.281)
ipr_border_measures	-1.284 (2.011)
ipr_m_copyrights_related_rights	-1.406 (3.039)
ipr_m_trademarks	3.61 (4.212)
ipr_m_geo_indications	-2.345 (2.559)
ipr_m_industrial_designs	-0.417 (3.362)
ipr_m_patents	2.673 (3.355)
ipr_m_undisclosed_information	-0.645 (2.895)
ipr_m_layout_design_integ_circuits	-3.95 (3.048)
ipr_m_new_plant_varieties	2.757 (1.681)

ipr_m_trad_knowledge_genetic_re-sources	-1.164 (3.731)
ipr_m_encrypted_program_carrying_sat-ellite_signals	-0.521 (3.005)
ipr_m_domain_names	0.271 (5.631)
Control Variables	
Democratisation (Polity 2) (mean)	-0.726*** (0.087)
Classic IP leaders	-1.057 (1.204)
Countries with a high increase of patent protection	-2.019* (0.955)
New IP producers and developers	1.892 (1.387)
ln GDP	-0.716** (0.265)
ln GDPpc	2.044*** (0.456)
ln Geographic distance (mean)	-0.495 (0.543)
Intercept	15.129* (6.748)
Model	m3.4_bv_df10l_gi
Observations	1558

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: PTA Member Applications for Industrial Designs I	Overall IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables					
ipr_mentioned	1.282 (0.973)	2.605 (1.855)	2.879 (2.08)	1.211 (2.062)	-11.554 (16.12)
ipr_1_article	0.764 (0.938)	1.52 (1.712)	1.685 (1.809)	-0.72 (2.303)	6.298 (14.563)
ipr_more_than_1_article	-0.154 (0.899)	0.108 (1.673)	-0.491 (1.959)	3.771 (2.573)	5.72 (15.947)
ipr_mfn	-1.266* (0.594)	-5.243** (1.607)	-4.351* (1.963)	-4.256* (2.021)	-12.468 (13.371)
ipr_nt	0.575 (0.787)	7.315*** (1.955)	10.086*** (2.662)	22.174*** (3.678)	6.976 (16.004)
ipr_as_investment	-3.423 (2.515)	-5.712 (5.197)	-3.128 (5.959)	-1.266 (7.377)	-50.218 (63.811)
ipr_investment_mfn	-2.93* (1.438)	-3.718 (2.965)	-5.967. (3.298)	-27.4*** (5.086)	-21.865 (33.366)
ipr_investment_nt	NA	NA	NA	NA	NA
ipr_assistance_coop_coordination	-1.669* (0.694)	-4.012** (1.337)	-3.584* (1.503)	-8.243*** (2.234)	-6.954 (11.781)
ipr_general_enforcement	2.499*** (0.717)	1.704 (1.397)	0.582 (1.615)	-0.406 (1.795)	6.403 (11.465)
ipr_dispute_settlement_mechanism	0.123 (0.765)	-1.169 (1.497)	-1.386 (2.339)	-16.547*** (4.846)	-5.357 (12.698)
ipr_investment_dispute_settle-ment_mechanism	3.081. (1.781)	9.266* (4.266)	6.019 (5.301)	-3.385 (6.202)	20.867 (37.595)
ipr_investment_expropriation_exception	2.199 (1.366)	-1.668 (3.323)	-1.886 (4.096)	16.211*** (4.848)	17.834 (36.587)
ipr_implementation	0.696 (0.508)	0.218 (1.073)	0.433 (1.225)	4.692** (1.502)	5.434 (9.322)
ipr_border_measures	1.465** (0.502)	3.508* (1.358)	2.946. (1.696)	8.18*** (2.191)	18.358 (11.319)
ipr_m_copyrights_related_rights	-0.547 (1.124)	4.232. (2.5)	7.4. (4.391)	28.66** (9.194)	-25.907 (25.929)
ipr_m_trademarks	13.319*** (1.664)	20.835*** (4.87)	11.425* (5.75)	25.294** (9.724)	54.24. (32.712)
ipr_m_geo_indications	-12.565*** (1.548)	-28.675*** (3.334)	-21.196*** (3.35)	-42.666*** (4.988)	-43.062 (27.154)
ipr_m_industrial_designs	-1.812 (1.6)	2.731 (3.843)	4.501 (4.704)	4.946 (6.876)	-26.674 (30.251)
ipr_m_patents	0.09 (1.652)	-3.41 (3.142)	0.588 (3.745)	-0.142 (5.698)	-33.766 (31.795)
ipr_m_undisclosed_information	0.403 (0.763)	-2.113 (1.781)	-5.091 (3.475)	-13.843. (7.134)	31.817 (23.909)
ipr_m_layout_design_integ_circuits	-0.926 (1.267)	4.884. (2.495)	1.666 (3.091)	-1.939 (5.221)	35.923 (31.509)
ipr_m_new_plant_varieties	0.226 (0.559)	-2.654. (1.443)	-1.467 (1.553)	3.307. (1.902)	-2.383 (11.164)

ipr_m_trad_knowledge_genetic_resources	-1.969** (0.629)	-2.801. (1.55)	-1.417 (2.021)	-3.298 (5.645)	-14.621 (13.947)
ipr_m_encrypted_program_carrying_satellite_signals	1 (0.747)	4.876** (1.524)	4.802** (1.76)	-10.052** (3.688)	-3.655 (11.958)
ipr_m_domain_names	-2.976 (1.857)	-6.469 (4.138)	-7.426 (5.225)	0.582 (8.686)	13.279 (34.672)
Control Variables					
Democratisation (Polity 2) (mean)	-0.002 (0.056)	-0.084 (0.123)	-0.035 (0.126)	-0.307* (0.156)	-5.877*** (1.237)
Classic IP leaders	-0.762 (0.626)	-1.303 (1.343)	-1.608 (1.526)	-6.869*** (1.735)	-7.755 (13.023)
Countries with a high increase of patent protection	-0.358 (0.644)	-1.294 (1.226)	-1.144 (1.306)	0.567 (1.447)	18.613 (12.88)
New IP producers and developers	-0.713 (0.561)	-0.403 (1.127)	-0.296 (1.178)	-4.644* (2.032)	-23.376* (10.366)
ln GDP	0.232. (0.123)	0.53* (0.249)	0.567* (0.274)	0.44 (0.314)	8.327*** (2.157)
ln GDPpc	-0.532* (0.236)	-0.495 (0.482)	-0.907. (0.524)	0.983 (0.619)	-10.555* (4.988)
ln Geographic distance (mean)	1.113*** (0.328)	2.449*** (0.702)	2.284** (0.789)	3.317*** (0.898)	16.373* (6.918)
Intercept	-9.124* (3.703)	-25.354** (7.841)	-21.669* (8.941)	-37.022*** (11.011)	-165.986* (83.16)
Model	m4.3_bv_df_gi	m4.3_bv_df3l_gi	m4.3_bv_df5l_gi	m4.3_bv_df10l_gi	m4.3_bv_dft_gi
Observations	755	568	506	361	430

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: PTA Member Applications for Industrial Designs II	First-comer IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables					
ipr_mentioned	-1.229 (2.085)	0.747 (5.055)	2.859 (5.433)	-1.253 (5.825)	-115.69*** (34.297)
ipr_1_article	1.916 (2.617)	-0.57 (5.626)	-1.647 (7.515)	-1.263 (9.902)	NA
ipr_more_than_1_article	-1.367 (3.666)	8.919 (12.353)	12.265 (13.627)	-16.574 (25.052)	-106.618. (63.226)
ipr_mfn	3.553. (2.068)	-0.469 (5.933)	0.902 (7.547)	-5.363 (9.997)	-1.196 (64.714)
ipr_nt	-1.244 (1.127)	-1.372 (2.115)	-1.278 (5.526)	3.596 (7.658)	-8.247 (15.34)
ipr_as_investment	-9.365* (4.66)	-5.056 (11.181)	-0.806 (10.487)	-13.282 (18.642)	NA
ipr_investment_mfn	7.529* (3.497)	1.245 (8.796)	-2.892 (9.131)	-2.631 (12.336)	NA
ipr_investment_nt	NA	NA	NA	NA	NA
ipr_assistance_coop_coordination	-0.52 (3.18)	-21.591 (14.988)	-31.008. (15.914)	6.799 (25.176)	NA
ipr_general_enforcement	-6.34* (3.107)	-4.717 (7.403)	-3.521 (7.588)	-14.975 (10.387)	NA
ipr_dispute_settlement_mechanism	0.195 (1.166)	-0.349 (1.975)	-0.378 (1.993)	-1.116 (2.927)	2.556 (18.483)
ipr_investment_dispute_settle-ment_mechanism	5.428 (3.682)	27.385* (12.779)	28.2* (12.247)	22.567 (22.37)	NA
ipr_investment_expropriation_exception	-3.873. (2.183)	-15.466** (5.616)	-16.12** (5.812)	-12.39 (11.965)	-13.178 (55.404)
ipr_implementation	-0.685 (1.066)	-0.075 (2.418)	0.197 (2.532)	-5.767 (4.345)	-10.263 (33.768)
ipr_border_measures	-0.457 (1.314)	-0.289 (2.818)	-0.668 (3.135)	2.977 (4.24)	-1.815 (26.939)
ipr_m_copyrights_related_rights	1.277 (3.795)	23.825 (19.203)	36.001. (19.655)	6.328 (24.49)	NA
ipr_m_trademarks	5.011 (4.066)	7.24 (13.701)	7.174 (14.229)	NA	NA
ipr_m_geo_indications	2.769 (3.253)	-13.634 (14.437)	-20.066 (15.525)	16.312 (19.934)	NA
ipr_m_industrial_designs	7.218 (5.816)	19.217 (13.356)	30.045* (14.063)	-13.19 (29.068)	-160.804. (89.935)
ipr_m_patents	-11.404. (6.633)	-50.389* (25.444)	-74.246** (26.436)	NA	NA
ipr_m_undisclosed_information	6.624. (3.517)	35.745 (21.879)	56.627* (23.119)	20.423 (30.475)	NA
ipr_m_layout_design_integ_circuits	-5.298* (2.307)	-9.689 (7.438)	-19.62* (8.162)	-19.041 (14.68)	NA
ipr_m_new_plant_varieties	-0.551 (1.043)	0.118 (2.378)	0.427 (2.553)	5.517 (3.699)	6.401 (27.268)
ipr_m_trad_knowledge_genetic_re-sources	-1.316 (0.857)	-3.503. (1.829)	-3.254. (1.896)	-1.434 (6.678)	-39.705 (31.274)

ipr_m_encrypted_program_carrying_satellite_signals	1.825 (1.23)	3.798 (2.361)	3.381 (2.474)	-2.43 (6.103)	-7.323 (16.282)
ipr_m_domain_names	9.221*** (2.625)	18.434*** (5.184)	17.252** (5.349)	2.006 (9.322)	-6.674 (40.155)
Control Variables					
Democratisation (Polity 2) (mean)	0.024 (0.063)	-0.052 (0.153)	0.023 (0.145)	-0.422. (0.236)	-7.442*** (1.19)
Classic IP leaders	0.305 (0.602)	-0.076 (1.339)	-0.437 (1.488)	-3.898. (2.281)	6.843 (11.695)
Countries with a high increase of patent protection	-0.969 (0.627)	-1.058 (1.241)	-1.909 (1.289)	-2.819. (1.606)	11.759 (11.483)
New IP producers and developers	-0.213 (0.565)	-0.539 (1.192)	-0.012 (1.2)	-2.24 (2.168)	-23.346** (8.135)
ln GDP	0.323* (0.127)	0.671* (0.268)	0.643* (0.289)	1.128** (0.394)	8.461*** (2.046)
ln GDPpc	-0.77** (0.259)	-0.502 (0.557)	-0.782 (0.585)	-0.827 (0.857)	-19.167*** (5.137)
ln Geographic distance (mean)	1.325*** (0.296)	2.62*** (0.616)	3.27*** (0.744)	6.27*** (1.052)	10.503* (4.617)
Intercept	-10.521** (3.398)	-30.467*** (7.432)	-32.234*** (8.204)	-59.679*** (12.481)	-41.147 (65.482)
Model	m4.3_bv_fc_df_gi	m4.3_bv_fc_df3l_gi	m4.3_bv_fc_df5l_gi	m4.3_bv_fc_df10l_gi	m4.3_bv_fc_dft_gi
Observations	755	568	506	361	430

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: PTA Member Applications for Patents I	Overall IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables					
ipr_mentioned	-6.771	2.535	4.757	1.439	42.349
	(28.966)	(11.37)	(17.478)	(4.58)	(43.509)
ipr_1_article	35.062	4.822	5.112	3.164	31.864
	(29.251)	(11.217)	(16.883)	(5.264)	(40.808)
ipr_more_than_1_article	-7.769	4.247	13.947	3.329	179.268***
	(27.262)	(10.805)	(17.779)	(5.782)	(43.836)
ipr_mfn	-26.401	-8.834	-7.188	-5.627	8.645
	(20.424)	(10.131)	(16.762)	(5.264)	(35.957)
ipr_nt	20.656	3.507	-3.792	-8.615	1.767
	(25.572)	(12.475)	(25.273)	(9.438)	(44.907)
ipr_as_investment	-85.368	-36.417	-76.693	-35.948*	-125.94
	(76.249)	(31.8)	(50.687)	(17.843)	(154.458)
ipr_investment_mfn	-67.912	-32.814	-39.709	-43.573***	96.351
	(48.027)	(20.391)	(31.522)	(13.161)	(96.554)
ipr_investment_nt	NA	NA	NA	NA	NA
ipr_assistance_coop_coordination	-72.544***	-18.761*	-23.205.	-15.176**	-107.58**
	(21.75)	(8.541)	(13.275)	(5.212)	(33.954)
ipr_general_enforcement	16.586	2.208	-2.223	1.483	-90.817**
	(22.061)	(9.011)	(14.863)	(4.146)	(30.986)
ipr_dispute_settlement_mechanism	-19.531	-7.975	-18.44	-28.747**	-56.593
	(24.48)	(10.093)	(22.084)	(10.799)	(36)
ipr_investment_dispute_settlement_mechanism	89.636.	36.083	94.629*	57.898***	16.28
	(54.046)	(24.314)	(43.622)	(13.473)	(92.506)
ipr_investment_expropriation_exception	-11.736	-12.003	-49.202	-28.391*	76.998
	(42.827)	(21.198)	(35.224)	(13.237)	(89.691)
ipr_implementation	14.951	3.838	8.23	7.036.	-45.517.
	(16.484)	(6.903)	(10.866)	(3.676)	(24.475)
ipr_border_measures	22.687	6.638	10.783	12.218*	-5.027
	(16.255)	(8.678)	(14.627)	(5.128)	(31.112)
ipr_m_copyrights_related_rights	39.313	-9.166	-55.91	41.89*	-504.869***
	(33.229)	(17.156)	(40.385)	(20.002)	(68.791)
ipr_m_trademarks	51.809	65.043*	131.056**	26.081	367.164***
	(43.946)	(28.323)	(47.961)	(20.512)	(81.406)
ipr_m_geo_indications	2.169	-2.901	-15.513	-1.131	-361.304***
	(38.779)	(15.781)	(24.314)	(8.684)	(60.704)
ipr_m_industrial_designs	-173.994***	-75.331**	-124.528**	-48.1**	43.349
	(47.169)	(23.722)	(38.452)	(15.843)	(82.443)
ipr_m_patents	168.561***	43.398*	68.232.	68.814***	434.143***
	(47.256)	(21.179)	(34.755)	(18.345)	(86.851)
ipr_m_undisclosed_information	46.75*	22.855.	67.35*	-15.618	666.07***
	(23.31)	(11.786)	(30.996)	(14.749)	(65.763)
ipr_m_layout_design_integ_circuits	-118.722**	-42.501*	-70.715*	-72.119***	-645.156***
	(39.002)	(17.511)	(29.829)	(17.334)	(84.459)

ipr_m_new_plant_varieties	3.996 (17.322)	-4.326 (8.716)	-20.309 (14.248)	7.025 (4.878)	-11.81 (31.263)
ipr_m_trad_knowledge_genetic_re-sources	-38.03. (19.784)	-9.364 (10.334)	-1.25 (18.954)	-8.542 (13.357)	45.949 (40.93)
ipr_m_encrypted_program_carrying_sat-ellite_signals	-0.145 (24.28)	4.082 (10.247)	-3.529 (17.074)	-24.466** (8.992)	-11.799 (33.584)
ipr_m_domain_names	202.797*** (55.554)	77.615** (25.327)	162.53*** (45.26)	57.78** (17.574)	-103.365 (106.361)
Control Variables					
Democratisation (Polity 2) (mean)	-0.78 (1.899)	0.026 (0.819)	0.443 (1.235)	0.181 (0.372)	-1.52 (3.692)
Classic IP leaders	9.82 (20.72)	0.68 (8.414)	-12.294 (13.269)	-5.073 (3.793)	-59.435 (36.56)
Countries with a high increase of patent protection	-8.842 (18.354)	-7.481 (7.604)	-11.11 (11.402)	-3.799 (3.406)	4.919 (30.029)
New IP producers and developers	-38.134* (17.286)	-11.243 (7.031)	-13.987 (10.705)	-13.292** (4.556)	-18.102 (28.408)
ln GDP	9.272* (3.621)	4.283** (1.52)	5.998* (2.445)	0.795 (0.698)	15.255** (5.445)
ln GDPpc	5.736 (7.002)	2.874 (2.889)	5.308 (4.571)	1.201 (1.426)	10.541 (12.105)
ln Geographic distance (mean)	24.488** (9.389)	14.26*** (4.153)	19.486** (6.331)	7.366*** (1.977)	19.702 (15.227)
Intercept	- 463.727*** (110.85)	- 241.082*** (50.006)	- 343.346*** (76.745)	-81.47** (24.929)	-621.401** (199.695)
Model	m4.4_bv_df_gi	m4.4_bv_df3l_gi	m4.4_bv_df5l_gi	m4.4_bv_df10l_gi	m4.4_bv_dft_gi
Observations	980	796	721	521	622

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: PTA Member Applications for Patents II	First-comer IPR		
	df	*df5l*	*df10l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables			
ipr_mentioned	7.62 (42.85)	-3.323 (58.059)	-7.267 (15.78)
ipr_1_article	7.283 (47.734)	12.496 (68.415)	13.044 (20.702)
ipr_more_than_1_article	-7.445 (53.117)	-7.479 (90.152)	1.261 (53.532)
ipr_mfn	-1.297 (30.977)	-15.871 (52.484)	-7.3 (25.127)
ipr_nt	-21.507 (14.308)	-2.151 (46.502)	-7.273 (17.971)
ipr_as_investment	-13.084 (62.302)	-11.03 (97.023)	-22.231 (52.518)
ipr_investment_mfn	-28.143 (45.235)	-43.867 (69.838)	-28.817 (23.051)
ipr_investment_nt	NA	NA	NA
ipr_assistance_coop_coordination	9.265 (48.321)	23.271 (78.369)	27.048 (29.171)
ipr_general_enforcement	-2.548 (39.206)	-10.361 (61.065)	-8.841 (26.814)
ipr_dispute_settlement_mechanism	-5.424 (13.817)	-12.311 (21.25)	-3.607 (6.792)
ipr_investment_dispute_settle-ment_mechanism	25.594 (64.173)	22.507 (102.341)	29.1 (45.954)
ipr_investment_expropriation_exception	-27.262 (26.703)	-42.722 (41.716)	-38.567. (20.646)
ipr_implementation	-8.436 (16.922)	-17.039 (27)	-7.009 (12.431)
ipr_border_measures	11.632 (20.055)	2.183 (33.587)	14.631 (11.582)
ipr_m_copyrights_related_rights	19.412 (50.001)	7.123 (82.011)	-0.265 (29.355)
ipr_m_trademarks	18.314 (54.406)	40.281 (91.94)	28.358 (30.59)
ipr_m_geo_indications	0.729 (62.328)	-7.137 (103.573)	-21.807 (55.072)
ipr_m_industrial_designs	-1.142 (56.542)	-18.408 (112.297)	-28.393 (42.181)
ipr_m_patents	-15.936 (56.906)	-8.958 (96.91)	NA
ipr_m_undisclosed_information	-17.207 (37.136)	-10.4 (75.886)	80.321 (60.96)
ipr_m_layout_design_integ_circuits	-9.269 (42.895)	-13.221 (84.494)	-83.536. (43.017)
ipr_m_new_plant_varieties	2.31 (15.392)	8.237 (25.988)	2.605 (11.16)
ipr_m_trad_knowledge_genetic_re-sources	-22.39. (12.914)	-34.536. (19.472)	-0.302 (15.312)

ipr_m_encrypted_program_carrying_satellite_signals	-3.445 (16.486)	-6.58 (26.797)	-26.214 (17.245)
ipr_m_domain_names	-7.449 (34.716)	-7.111 (53.571)	15.847 (20.09)
Control Variables			
Democratisation (Polity 2) (mean)	-0.15 (0.902)	-0.172 (1.381)	0.013 (0.484)
Classic IP leaders	8.4 (8.246)	6.46 (13.49)	-1.131 (4.674)
Countries with a high increase of patent protection	-17.824* (7.739)	-27.423* (11.81)	-12.528** (3.849)
New IP producers and developers	-5.959 (7.072)	-13.702 (11.084)	-9.124. (4.793)
ln GDP	7.652*** (1.63)	10.723*** (2.681)	2.604** (0.85)
ln GDPpc	-0.296 (3.248)	-0.356 (5.183)	0.06 (1.806)
ln Geographic distance (mean)	21.868*** (3.817)	32.271*** (6.195)	14.067*** (2.128)
Intercept	-358.681*** (48.766)	-507.026*** (74.729)	-165.461*** (26.741)
Model	m4.4_bv_fc_df3l_gi	m4.4_bv_fc_df5l_gi	m4.4_bv_fc_df10l_gi
Observations	796	721	521

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: Total *htp* Imports I	Overall IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables					
ipr_mentioned	-0.432 (1.029)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_1_article	-0.191 (1.049)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_more_than_1_article	-0.07 (0.734)	0 (0)	0 (0)	0** (0)	0 (0)
ipr_mfn	-0.31 (0.652)	0* (0)	0 (0)	0 (0)	0 (0)
ipr_nt	0.645 (0.757)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_as_investment	-0.524 (2.126)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_investment_mfn	-1.865. (1.034)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_investment_nt	1.965 (2.347)	NA	NA	NA	NA
ipr_assistance_coop_coordination	-0.205 (0.577)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_general_enforcement	-0.141 (0.645)	0* (0)	0 (0)	0 (0)	0 (0)
ipr_dispute_settlement_mechanism	-0.524 (0.801)	0 (0)	0 (0)	0. (0)	0 (0)
ipr_investment_dispute_settle-ment_mechanism	-0.075 (1.107)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_investment_expropriation_exception	0.022 (0.789)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_implementation	0.106 (0.481)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_border_measures	0.228 (0.684)	0** (0)	0. (0)	0* (0)	0 (0)
ipr_m_copyrights_related_rights	-0.097 (1.3)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_m_trademarks	-0.156 (1.339)	0 (0)	0 (0)	0. (0)	0 (0)
ipr_m_geo_indications	0.195 (0.699)	0 (0)	0 (0)	0. (0)	0 (0)
ipr_m_industrial_designs	0.197 (1.217)	0 (0)	0 (0)	0* (0)	0 (0)
ipr_m_patents	0.48 (1.024)	0 (0)	0 (0)	0 (0)	0*** (0)
ipr_m_undisclosed_information	-0.333 (0.846)	0. (0)	0 (0)	0 (0)	0 (0)
ipr_m_layout_design_integ_circuits	-0.048 (0.907)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_m_new_plant_varieties	0.299 (0.618)	0* (0)	0 (0)	0** (0)	0 (0)

ipr_m_trad_knowledge_genetic_re-sources	0.589 (0.591)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_m_encrypted_program_carrying_sat-ellite_signals	-0.193 (0.91)	0 (0)	0 (0)	0* (0)	0 (0)
ipr_m_domain_names	0.232 (1.3)	0 (0)	0 (0)	0 (0)	0 (0)
Control Variables					
Democratisation (Polity 2) (mean)	0.07* (0.031)	0 (0)	0 (0)	0 (0)	0 (0)
Classic IP leaders	-0.279 (0.542)	0*** (0)	0*** (0)	0*** (0)	0 (0)
Countries with a high increase of patent protection	-0.485 (0.367)	0 (0)	0 (0)	0 (0)	0. (0)
New IP producers and developers	0.798* (0.355)	0 (0)	0 (0)	0 (0)	0* (0)
ln GDP	0.26* (0.106)	0*** (0)	0*** (0)	0*** (0)	0*** (0)
ln GDPpc	-0.528** (0.176)	0*** (0)	0*** (0)	0** (0)	0 (0)
ln Geographic distance (mean)	-0.095 (0.206)	0** (0)	0** (0)	0 (0)	0 (0)
Intercept	-0.927 (2.325)	-1*** (0)	-1*** (0)	-1*** (0)	-1*** (0)
Model	m4.5_bv_df_gi	m4.5_bv_df3l_gi	m4.5_bv_df5l_gi	m4.5_bv_df10l_gi	m4.5_bv_dft_gi
Observations	623	305	311	203	182

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: Total *htp* Imports II	First-comer IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables					
ipr_mentioned	-0.359 (1.403)	0*** (0)	0*** (0)	0*** (0)	0 (0)
ipr_1_article	-0.072 (1.346)	0*** (0)	0*** (0)	0*** (0)	NA
ipr_more_than_1_article	-0.545 (1.296)	0*** (0)	0 (0)	0 (0)	0 (0)
ipr_mfn	-0.251 (1.232)	0** (0)	0** (0)	0 (0)	0 (0)
ipr_nt	-0.327 (1.204)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_as_investment	-0.872 (2.438)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_investment_mfn	1.156 (1.957)	0 (0)	0 (0)	0 (0)	NA
ipr_investment_nt	NA	NA	NA	NA	NA
ipr_assistance_coop_coordination	-0.333 (0.93)	0 (0)	0*** (0)	0** (0)	NA
ipr_general_enforcement	0.737 (1.345)	0. (0)	0** (0)	0 (0)	0 (0)
ipr_dispute_settlement_mechanism	-0.918 (1.242)	0* (0)	0. (0)	0 (0)	0 (0)
ipr_investment_dispute_settlement_mechanism	-1.178 (1.533)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_investment_expropriation_exception	2.594** (0.912)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_implementation	1.974* (0.792)	0 (0)	0 (0)	0 (0)	0 (0)
ipr_border_measures	-0.767 (1.001)	0. (0)	0 (0)	0 (0)	NA
ipr_m_copyrights_related_rights	0.804 (1.447)	0*** (0)	0*** (0)	0** (0)	NA
ipr_m_trademarks	0.012 (1.627)	0 (0)	0*** (0)	0* (0)	NA
ipr_m_geo_indications	-0.511 (1.45)	0* (0)	0 (0)	0 (0)	NA
ipr_m_industrial_designs	-0.439 (1.576)	0*** (0)	0*** (0)	0*** (0)	0 (0)
ipr_m_patents	0.762 (1.54)	0 (0)	0 (0)	0** (0)	0 (0)
ipr_m_undisclosed_information	0.188 (1.53)	0 (0)	0** (0)	0. (0)	NA
ipr_m_layout_design_integ_circuits	-0.768 (1.184)	0*** (0)	0*** (0)	0 (0)	0 (0)
ipr_m_new_plant_varieties	0.112 (0.871)	0** (0)	0 (0)	0 (0)	0 (0)
ipr_m_trad_knowledge_genetic_resources	1.095 (0.668)	0 (0)	0 (0)	0 (0)	0*** (0)

ipr_m_encrypted_program_carrying_satellite_signals	0.813 (1.229)	0 (0)	0 (0)	0* (0)	0 (0)
ipr_m_domain_names	-0.209 (1.32)	0* (0)	0 (0)	0* (0)	0 (0)
Control Variables					
Democratisation (Polity 2) (mean)	0.055. (0.03)	0 (0)	0 (0)	0 (0)	0 (0)
Classic IP leaders	-0.462 (0.476)	0*** (0)	0*** (0)	0** (0)	0 (0)
Countries with a high increase of patent protection	-0.219 (0.333)	0 (0)	0 (0)	0 (0)	0 (0)
New IP producers and developers	0.934** (0.332)	0 (0)	0 (0)	0 (0)	0* (0)
ln GDP	0.256* (0.103)	0*** (0)	0*** (0)	0*** (0)	0** (0)
ln GDPpc	-0.521** (0.178)	0* (0)	0* (0)	0 (0)	0 (0)
ln Geographic distance (mean)	-0.027 (0.185)	0* (0)	0** (0)	0 (0)	0 (0)
Intercept	-1.907 (2.115)	-1*** (0)	-1*** (0)	-1*** (0)	-1*** (0)
Model	m4.5_bv_fc_df_gi	m4.5_bv_fc_df3l_gi	m4.5_bv_fc_df5l_gi	m4.5_bv_fc_df10l_gi	m4.5_bv_fc_dft_gi
Observations	623	305	311	203	182

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: Total *mhtp* Imports	Overall IPR		
	df	*df3l*	*df5l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables			
ipr_mentioned	30.344 (511.767)	0 (0)	0 (0)
ipr_1_article	36.979 (521.895)	0 (0)	0 (0)
ipr_more_than_1_article	25.284 (365.217)	0 (0)	0 (0)
ipr_mfn	-316.896 (324.172)	0 (0)	0 (0)
ipr_nt	22.239 (376.607)	0 (0)	0 (0)
ipr_as_investment	-471.729 (1057.293)	0 (0)	0 (0)
ipr_investment_mfn	53.27 (514.22)	0 (0)	0 (0)
ipr_investment_nt	113.056 (1167.52)	0 (0)	0 (0)
ipr_assistance_coop_coordination	115.51 (286.997)	0 (0)	0 (0)
ipr_general_enforcement	128.678 (320.589)	0 (0)	0 (0)
ipr_dispute_settlement_mechanism	-6.326 (398.4)	0 (0)	0 (0)
ipr_investment_dispute_settlement_mechanism	52.356 (550.757)	0 (0)	0 (0)
ipr_investment_expropriation_exception	-90.803 (392.422)	0 (0)	0 (0)
ipr_implementation	-110.469 (239.48)	0 (0)	0 (0)
ipr_border_measures	-117.536 (340.198)	0 (0)	0 (0)
ipr_m_copyrights_related_rights	40.583 (646.424)	0 (0)	0 (0)
ipr_m_trademarks	254.07 (666.067)	0 (0)	0 (0)
ipr_m_geo_indications	-27.664 (347.671)	0 (0)	0 (0)
ipr_m_industrial_designs	-429.315 (605.425)	0 (0)	0 (0)
ipr_m_patents	95.495 (509.273)	0 (0)	0 (0)
ipr_m_undisclosed_information	6.178 (420.998)	0 (0)	0 (0)
ipr_m_layout_design_integ_circuits	-38.857 (451.336)	0 (0)	0 (0)
ipr_m_new_plant_varieties	682.929* (307.213)	0. (0)	0. (0)

ipr_m_trad_knowledge_genetic_resources	-268.347 (294.004)	0 (0)	0 (0)
ipr_m_encrypted_program_carrying_satellite_signals	-113.691 (452.723)	0 (0)	0 (0)
ipr_m_domain_names	16.073 (646.435)	0 (0)	0 (0)
Control Variables			
Democratisation (Polity 2) (mean)	11.196 (15.557)	0 (0)	0 (0)
Classic IP leaders	-280.168 (269.824)	0 (0)	0 (0)
Countries with a high increase of patent protection	-5.685 (182.363)	0 (0)	0 (0)
New IP producers and developers	-35.209 (176.632)	0 (0)	0 (0)
ln GDP	1.068 (52.567)	0 (0)	0 (0)
ln GDPpc	42.984 (87.354)	0 (0)	0 (0)
ln Geographic distance (mean)	-71.585 (102.425)	0 (0)	0 (0)
Intercept	150.31 (1156.213)	-1*** (0)	-1*** (0)
Model	m4.6_bv_df_gi	m4.6_bv_df3l_gi	m4.6_bv_df5l_gi
Observations	623	541	464

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: Total *mltp* Imports	Overall IPR		First-comer IPR	
	df	*df5l*	*df5l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables				
ipr_mentioned	0.022 (0.145)	0 (0)	0** (0)	0 (0)
ipr_1_article	0.013 (0.148)	0 (0)	0* (0)	0 (0)
ipr_more_than_1_article	0.035 (0.104)	0 (0)	0 (0)	0 (0)
ipr_mfn	0.021 (0.092)	0 (0)	0* (0)	0 (0)
ipr_nt	-0.042 (0.107)	0 (0)	0 (0)	0 (0)
ipr_as_investment	0.232 (0.3)	0 (0)	0 (0)	0 (0)
ipr_investment_mfn	-0.205 (0.146)	0 (0)	0 (0)	NA
ipr_investment_nt	-0.122 (0.332)	0 (0)	NA	NA
ipr_assistance_coop_coordination	-0.14. (0.082)	0 (0)	0 (0)	0* (0)
ipr_general_enforcement	0.027 (0.091)	0** (0)	0** (0)	0 (0)
ipr_dispute_settlement_mechanism	-0.155 (0.113)	0 (0)	0 (0)	0 (0)
ipr_investment_dispute_settle-ment_mechanism	-0.079 (0.156)	0 (0)	0 (0)	0 (0)
ipr_investment_expropriation_exception	-0.041 (0.111)	0 (0)	0 (0)	0 (0)
ipr_implementation	0.005 (0.068)	0 (0)	0. (0)	0 (0)
ipr_border_measures	0.051 (0.097)	0*** (0)	0 (0)	0 (0)
ipr_m_copyrights_related_rights	0.041 (0.184)	0 (0)	0** (0)	0 (0)
ipr_m_trademarks	-0.069 (0.189)	0 (0)	0 (0)	0 (0)
ipr_m_geo_indications	-0.005 (0.099)	0 (0)	0 (0)	0 (0)
ipr_m_industrial_designs	0.038 (0.172)	0 (0)	0* (0)	0 (0)
ipr_m_patents	0.194 (0.145)	0 (0)	0 (0)	0 (0)
ipr_m_undisclosed_information	-0.028 (0.12)	0 (0)	0* (0)	0 (0)
ipr_m_layout_design_integ_circuits	-0.171 (0.128)	0 (0)	0* (0)	0 (0)
ipr_m_new_plant_varieties	0.12 (0.087)	0* (0)	0 (0)	0 (0)

ipr_m_trad_knowledge_genetic_re-sources	0.006 (0.084)	0 (0)	0 (0)	0 (0)
ipr_m_encrypted_program_carrying_sat-ellite_signals	-0.106 (0.129)	0 (0)	0 (0)	0 (0)
ipr_m_domain_names	0.228 (0.184)	0 (0)	0 (0)	0 (0)
Control Variables				
Democratisation (Polity 2) (mean)	0.012** (0.004)	0 (0)	0 (0)	0 (0)
Classic IP leaders	-0.087 (0.077)	0*** (0)	0*** (0)	0* (0)
Countries with a high increase of patent protection	-0.014 (0.052)	0. (0)	0* (0)	0 (0)
New IP producers and developers	0.076 (0.05)	0 (0)	0 (0)	0 (0)
ln GDP	0.015 (0.015)	0*** (0)	0*** (0)	0*** (0)
ln GDPpc	-0.071** (0.025)	0** (0)	0 (0)	0 (0)
ln Geographic distance (mean)	0.04 (0.029)	0** (0)	0 (0)	0 (0)
Intercept	0.07 (0.328)	-1*** (0)	-1*** (0)	-1*** (0)
Model	m4.7_bv_df_gi	m4.7_bv_df5l_gi	m4.7_bv_fc_df5l_gi	m4.7_bv_fc_dft_gi
Observations	623	482	482	279

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: Total *ltp* Imports	Overall IPR *df*	FC IPR *df*
Variables	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables		
ipr_mentioned	11315.6 (7144.3)	-2670.5 (9197.3)
ipr_1_article	-9437.8 (7124.9)	4252.1 (9235.1)
ipr_more_than_1_article	404.7 (5727.2)	1633.8 (9687.8)
ipr_mfn	-6208.6 (4766.8)	-135.3 (9828.4)
ipr_nt	476.3 (5948.4)	-9464.3 (8474.4)
ipr_as_investment	-31388.2. (18318.6)	-26473.2. (15382.3)
ipr_investment_mfn	4105.4 (7248)	-233.5 (12055.7)
ipr_investment_nt	21087.8 (18414.6)	NA
ipr_assistance_coop_coordination	-2082 (4441.5)	-918.8 (5947.5)
ipr_general_enforcement	2407.8 (5019.6)	-8099.3 (9352.8)
ipr_dispute_settlement_mechanism	796.2 (6662.6)	3260.4 (8313.2)
ipr_investment_dispute_settle-ment_mechanism	11616.8 (8999.2)	23343.9* (10075.4)
ipr_investment_expropriation_exception	-11673.4. (5976.4)	-6682.7 (6361)
ipr_implementation	-6921. (3840.8)	2719.9 (5962.1)
ipr_border_measures	11102.3* (5481.8)	4109 (7720.4)
ipr_m_copyrights_related_rights	7025.4 (10383)	5936.6 (9778.8)
ipr_m_trademarks	3390.8 (12334.7)	-12389 (11737.4)
ipr_m_geo_indications	-4780.1 (5199)	5979.4 (11590.1)
ipr_m_industrial_designs	5679 (8793.4)	-14201.2 (10942)
ipr_m_patents	1460.2 (8724.8)	29122.9** (10578.3)
ipr_m_undisclosed_information	622.5 (6935.6)	-17620.6 (12797.8)
ipr_m_layout_design_integ_circuits	-4689.5 (7546.7)	-2436.1 (9103.4)
ipr_m_new_plant_varieties	-2007 (4430.1)	23974.2*** (6706.9)

ipr_m_trad_knowledge_genetic_re-sources	-5174.3 (4678.4)	-3222.8 (4886.1)
ipr_m_encrypted_program_carrying_sat-ellite_signals	-15744.2. (8069.4)	7127.3 (9050.6)
ipr_m_domain_names	2075.7 (9871.8)	-7259.5 (8516.4)
Control Variables		
Democratisation (Polity 2) (mean)	199.3 (233.1)	156.2 (228.7)
Classic IP leaders	-1663.9 (4306.7)	-552.3 (3677.1)
Countries with a high increase of patent protection	547.8 (2458.1)	-1102.3 (2265.7)
New IP producers and developers	1086.7 (2464.9)	-702.4 (2335.1)
ln GDP	1233.8. (729.4)	1416.1. (731.6)
ln GDPpc	653 (1227)	1450.7 (1278.2)
ln Geographic distance (mean)	-3065.8* (1481.5)	-3204.6* (1319.3)
Intercept	-14035.9 (16231.7)	-20623.1 (15076.9)
Model	m4.8_bv_df_gi	m4.8_bv_fc_df_gi
Observations	462	462

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: PTA Member *htp* Imports	Overall IPR *df3l*	*df5l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables			
ipr_mentioned	-5361104 (43658706)	-13964439 (36763759)	27062732 (30717169)
ipr_1_article	21499886 (45248500)	26793323 (37860621)	-8467403 (31236256)
ipr_more_than_1_article	-68958522* (32958992)	-21270654 (28624279)	-50525577* (22538157)
ipr_mfn	1075537 (31994955)	-2099581 (26953535)	3178114 (19980880)
ipr_nt	-52185402 (36520795)	-44220614 (31047309)	-39362924. (23101720)
ipr_as_investment	-93648573 (82157029)	-129218166 (78489693)	-71708321 (63462114)
ipr_investment_mfn	20962664 (46448849)	26331663 (40162743)	13644141 (30843692)
ipr_investment_nt	-2191869 (95637615)	33267141 (95925982)	13483128 (69522356)
ipr_assistance_coop_coordination	61334723* (26120596)	33192311 (22119064)	30369551. (17385277)
ipr_general_enforcement	68975413* (30301090)	47916087. (28138948)	57557472** (19728338)
ipr_dispute_settlement_mechanism	-46563861 (39966659)	-51406178 (33125733)	-32176150 (25837323)
ipr_investment_dispute_settle-ment_mechanism	91379173. (54345299)	87453275. (50136635)	44346181 (32874601)
ipr_investment_expropriation_exception	-59756650 (38881880)	-63157939. (33324269)	-28339958 (23590008)
ipr_implementation	15471605 (23943546)	1123582 (20289552)	7749450 (15185501)
ipr_border_measures	58710931. (33595656)	87475126** (30220936)	44922247* (21189312)
ipr_m_copyrights_related_rights	-73699689 (75999499)	-29247540 (51274136)	-10718405 (38250628)
ipr_m_trademarks	-53442511 (83784396)	-92324300 (63929541)	-78091687* (39397305)
ipr_m_geo_indications	64647026* (30968779)	56821235* (25514402)	40376150. (21137984)
ipr_m_industrial_designs	44271276 (59932572)	100232834. (53301642)	53608067 (41956330)
ipr_m_patents	-2316391 (54645719)	-30957418 (54831114)	-14125535 (31136898)
ipr_m_undisclosed_information	5095038 (40513539)	-16917303 (36551253)	6826356 (27693036)
ipr_m_layout_design_integ_circuits	-4448144 (42065756)	-7853176 (36935409)	-16171350 (28678169)
ipr_m_new_plant_varieties	-50420946. (29246596)	-44708179. (24053484)	-29972605 (19301434)

ipr_m_trad_knowledge_genetic_re-sources	30530847 (29459946)	40065244 (25559575)	26579301 (18276560)
ipr_m_encrypted_program_carrying_sat-ellite_signals	12012177 (44366021)	-15880789 (40756110)	2367980 (27172518)
ipr_m_domain_names	61616533 (60841448)	99431537. (55350493)	45686934 (39996232)
Control Variables			
Democratisation (Polity 2) (mean)	-3065183* (1517841)	-3730553** (1177264)	-2021517* (976771)
Classic IP leaders	-50563748. (26388467)	-26132327 (22695943)	-21234653 (16731182)
Countries with a high increase of patent protection	-3729704 (16126032)	4636291 (13338434)	-4208411 (11042594)
New IP producers and developers	-34352657* (15409341)	-19877554 (13697137)	-22209497* (10671154)
ln GDP	22114809*** (4749833)	12502854** (3833658)	11713774*** (3223347)
ln GDPpc	-19214997* (7920917)	-6194843 (6296512)	-5495033 (5274363)
ln Geographic distance (mean)	23942390* (9341784)	12659317. (7617838)	12085017. (6267160)
Intercept	-545740558*** (106488532)	-343133438*** (84520345)	-324000696*** (71494326)
Model	m4.9_bv_df3l_gi	m4.9_bv_df5l_gi	m4.9_bv_dft_gi
Observations	516	466	576

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: PTA Member *mhtp* Imports	Overall IPR		
	df	*df5l*	*df10l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables			
ipr_mentioned	-339.75 (1152.89)	-99372 (1299884)	369118 (731574)
ipr_1_article	1203.53 (1166.3)	284271 (1347324)	-25871 (744229)
ipr_more_than_1_article	-3802.71*** (858.58)	-1590338 (988352)	-1343289* (539755)
ipr_mfn	-593.46 (747.49)	-662953 (939197)	-335843 (470390)
ipr_nt	323.54 (872.43)	-18994 (1081600)	-13994 (548565)
ipr_as_investment	797.23 (2361.52)	-192388 (2447272)	-162377 (1510994)
ipr_investment_mfn	200.92 (1149.01)	274471 (1383295)	60194 (733564)
ipr_investment_nt	-2212.42 (2606.12)	-995565 (2851310)	-624320 (1656592)
ipr_assistance_coop_coordination	2033.19** (657.17)	787381 (780388)	867672* (415189)
ipr_general_enforcement	3475.45*** (746.84)	1496626. (896045)	1135708* (468103)
ipr_dispute_settlement_mechanism	-762.27 (892.06)	-353212 (1158611)	-171921 (596536)
ipr_investment_dispute_settle-ment_mechanism	1931.47 (1238.96)	956923 (1618753)	574541 (783576)
ipr_investment_expropriation_exception	-1187.61 (882.99)	-637773 (1152372)	-638872 (561305)
ipr_implementation	1091.8* (550.19)	606305 (700165)	542900 (357053)
ipr_border_measures	-520.84 (773.54)	-61921 (990569)	-127033 (501928)
ipr_m_copyrights_related_rights	3038.07. (1600.96)	-2988237 (2262479)	-627044 (909719)
ipr_m_trademarks	-3833.29* (1591.08)	3547834 (2473024)	733953 (935662)
ipr_m_geo_indications	161.58 (793.28)	173253 (915856)	65284 (500649)
ipr_m_industrial_designs	31.59 (1461.71)	-930554 (1684689)	-1133936 (937572)
ipr_m_patents	-436.91 (1163.28)	-520302 (1591084)	136082 (736311)
ipr_m_undisclosed_information	300.46 (964.28)	657976 (1173024)	533671 (635171)
ipr_m_layout_design_integ_circuits	-1087.7 (1053.37)	253671 (1223978)	148953 (667164)
ipr_m_new_plant_varieties	-527.79 (723.29)	-575649 (868193)	-248472 (457998)

ipr_m_trad_knowledge_genetic_re-sources	-472.86 (670.73)	-715270 (874081)	-596149 (435209)
ipr_m_encrypted_program_carrying_sat-ellite_signals	-674.85 (1020.23)	-107302 (1301729)	82526 (640670)
ipr_m_domain_names	336.06 (1460.93)	-589862 (1775721)	-544902 (931481)
Control Variables			
Democratisation (Polity 2) (mean)	10.37 (37.22)	22985 (45162)	11302 (23389)
Classic IP leaders	-462.71 (618.87)	-1231709 (789312)	-1045470** (401089)
Countries with a high increase of patent protection	-407.26 (418.88)	-245872 (479973)	-283877 (262576)
New IP producers and developers	-372.17 (403.15)	-619520 (459006)	-468975. (253917)
ln GDP	123.4 (121.2)	254918. (142458)	199085* (77065)
ln GDPpc	10.99 (199.04)	2436 (238336)	43810 (126878)
ln Geographic distance (mean)	490.65* (239.67)	237873 (279609)	194115 (149211)
Intercept	-6733.19* (2657.89)	-7460198* (3177558)	-6330720*** (1701804)
Model	m4.10_bv_df_gi	m4.10_bv_df3l_gi	m4.10_bv_dft_gi
Observations	575	519	579

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: PTA Member *mltp* Imports	Overall IPR *df*	FC IPR *df5l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables		
ipr_mentioned	7471.93 (5492.88)	-1816.18 (8004.33)
ipr_1_article	-6061.36 (5573.22)	3039.95 (7880.45)
ipr_more_than_1_article	-2321.81 (4053.57)	223.52 (7925.93)
ipr_mfn	-3653.19 (3532.33)	-213.68 (7122.59)
ipr_nt	-825.32 (4069.05)	-5825.8 (6985.07)
ipr_as_investment	-14958.62 (11272.85)	-23961.29. (13204)
ipr_investment_mfn	1250.86 (5484.88)	-47.01 (10541.95)
ipr_investment_nt	11242.93 (12437.58)	NA
ipr_assistance_coop_coordination	50.45 (3119.57)	-1582.64 (5123.28)
ipr_general_enforcement	5931.55. (3545.56)	-3810.38 (7434.07)
ipr_dispute_settlement_mechanism	-1111.73 (4262.23)	2085.2 (6664.01)
ipr_investment_dispute_settle-ment_mechanism	8037.02 (5891.2)	23066.84** (8408.83)
ipr_investment_expropriation_exception	-10362.22* (4201.22)	-3881.68 (4907.03)
ipr_implementation	-5577.27* (2614.31)	1966.29 (4503.69)
ipr_border_measures	5550.41 (3687.62)	2383.92 (5426.92)
ipr_m_copyrights_related_rights	2781.15 (7226.44)	4758.88 (8295)
ipr_m_trademarks	3273.4 (7343.59)	-5688.8 (8897.05)
ipr_m_geo_indications	-2109.11 (3773.95)	466.56 (8269.43)
ipr_m_industrial_designs	3548.43 (6977.63)	-14216.16. (8521.35)
ipr_m_patents	3188.05 (5538.36)	21885.52** (8408.15)
ipr_m_undisclosed_information	-1597.52 (4600.85)	-12314.22 (8606.63)
ipr_m_layout_design_integ_circuits	-3564.48 (5024.09)	1718.46 (6456.78)
ipr_m_new_plant_varieties	-2420.11 (3381.7)	16815.3*** (4948.95)

ipr_m_trad_knowledge_genetic_re-sources	-3546.33 (3172.93)	-1773.52 (3590.22)
ipr_m_encrypted_program_carrying_sat-ellite_signals	-6679.1 (4859.78)	3429.39 (6641.53)
ipr_m_domain_names	-1464.97 (6975.27)	-6365.15 (7103.6)
Control Variables		
Democratisation (Polity 2) (mean)	196.43 (174.98)	134.21 (172.58)
Classic IP leaders	-1957.92 (2940.4)	-244.26 (2618.59)
Countries with a high increase of patent protection	-159.07 (1982.77)	-713.71 (1817.61)
New IP producers and developers	848.16 (1911.15)	-540.81 (1802.47)
ln GDP	859.64 (570.86)	986.36. (564.05)
ln GDPpc	314.32 (944.61)	796.28 (972.74)
ln Geographic distance (mean)	-1793.16 (1126.29)	-2767.66** (1013.98)
Intercept	-11244.74 (12562.92)	-8344.42 (11669.41)
Model	m4.11_bv_df_gi	m4.11_bv_fc_df_gi
Observations	590	590

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: PTA Member *ltp* Imports	Overall IPR		First-comer IPR		
	df	*df5l*	*df*	*df5l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables					
ipr_mentioned	0.11 (0.153)	0 (0)	-0.001 (0.212)	0 (0)	0* (0)
ipr_1_article	0 (0.156)	0 (0)	-0.013 (0.203)	0 (0)	0 (0)
ipr_more_than_1_article	0.142 (0.109)	0 (0)	0.084 (0.195)	0 (0)	0 (0)
ipr_mfn	0.001 (0.097)	0 (0)	-0.128 (0.186)	0 (0)	0 (0)
ipr_nt	-0.08 (0.112)	0 (0)	-0.004 (0.182)	0 (0)	0 (0)
ipr_as_investment	0.271 (0.315)	0 (0)	-0.286 (0.368)	0 (0)	0 (0)
ipr_investment_mfn	-0.124 (0.153)	0 (0)	0.211 (0.295)	0 (0)	NA
ipr_investment_nt	-0.21 (0.348)	0. (0)	NA	NA	NA
ipr_assistance_coop_coordination	-0.18* (0.086)	0 (0)	-0.045 (0.14)	0 (0)	0* (0)
ipr_general_enforcement	-0.057 (0.096)	0 (0)	0.219 (0.203)	0 (0)	0. (0)
ipr_dispute_settlement_mechanism	-0.16 (0.119)	0 (0)	0.013 (0.187)	0 (0)	0 (0)
ipr_investment_dispute_settle-ment_mechanism	-0.104 (0.164)	0. (0)	-0.129 (0.231)	0. (0)	0 (0)
ipr_investment_expropriation_exception	-0.06 (0.117)	0 (0)	0.087 (0.138)	0 (0)	0 (0)
ipr_implementation	-0.027 (0.071)	0 (0)	-0.022 (0.119)	0* (0)	0 (0)
ipr_border_measures	0.106 (0.101)	0* (0)	-0.028 (0.151)	0 (0)	0 (0)
ipr_m_copyrights_related_rights	-0.015 (0.193)	0 (0)	0.198 (0.218)	0. (0)	0** (0)
ipr_m_trademarks	-0.043 (0.198)	0 (0)	0.041 (0.245)	0 (0)	0* (0)
ipr_m_geo_indications	-0.046 (0.104)	0 (0)	-0.063 (0.219)	0 (0)	0 (0)
ipr_m_industrial_designs	0.117 (0.18)	0 (0)	-0.015 (0.238)	0 (0)	0 (0)
ipr_m_patents	0.214 (0.152)	0 (0)	0.176 (0.232)	0 (0)	0 (0)
ipr_m_undisclosed_information	-0.054 (0.125)	0 (0)	-0.067 (0.231)	0 (0)	0 (0)
ipr_m_layout_design_integ_circuits	-0.246. (0.134)	0. (0)	-0.112 (0.178)	0 (0)	0 (0)
ipr_m_new_plant_varieties	0.136 (0.092)	0* (0)	0.017 (0.131)	0 (0)	0 (0)

ipr_m_trad_knowledge_genetic_resources	0.028 (0.088)	0. (0)	0.198* (0.101)	0 (0)	0. (0)
ipr_m_encrypted_program_carrying_satellite_signals	-0.142 (0.135)	0 (0)	-0.13 (0.185)	0 (0)	0 (0)
ipr_m_domain_names	0.342. (0.193)	0. (0)	0.126 (0.199)	0 (0)	0 (0)
Control Variables					
Democratisation (Polity 2) (mean)	0.015** (0.005)	0. (0)	0.013** (0.005)	0* (0)	0 (0)
Classic IP leaders	-0.091 (0.08)	0*** (0)	-0.088 (0.072)	0*** (0)	0. (0)
Countries with a high increase of patent protection	-0.007 (0.054)	0 (0)	0.006 (0.05)	0* (0)	0 (0)
New IP producers and developers	0.052 (0.053)	0 (0)	0.047 (0.05)	0 (0)	0 (0)
ln GDP	0.014 (0.016)	0*** (0)	0.018 (0.016)	0*** (0)	0*** (0)
ln GDPpc	-0.06* (0.026)	0. (0)	-0.055* (0.027)	0 (0)	0 (0)
ln Geographic distance (mean)	0.018 (0.031)	0 (0)	0.001 (0.028)	0 (0)	0 (0)
Intercept	0.14 (0.345)	-1*** (0)	0.118 (0.319)	-1*** (0)	-1*** (0)
Model	m4.12_bv_df_gi	m4.12_bv_df5l_gi	m4.12_bv_fc_df_gi	m4.12_bv_fc_df5l_gi	m4.12_bv_fc_dft_gi
Observations	623	493	623	493	289

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDP I	Overall IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables					
ipr_mentioned	0.082** (0.028)	0.111. (0.062)	0.104 (0.116)	0.045 (0.363)	0.091** (0.032)
ipr_1_article	0.007 (0.033)	0.012 (0.073)	-0.042 (0.138)	-0.156 (0.477)	-0.014 (0.038)
ipr_more_than_1_article	-0.027 (0.03)	-0.024 (0.067)	0 (0.129)	-0.179 (0.46)	0.019 (0.034)
ipr_mfn	-0.028 (0.025)	0.092 (0.063)	0.236. (0.124)	-0.085 (0.42)	0.017 (0.031)
ipr_nt	-0.086** (0.031)	-0.288*** (0.078)	-0.263 (0.165)	-0.216 (0.624)	-0.19*** (0.038)
ipr_as_investment	-0.29*** (0.075)	-0.28. (0.167)	-0.54. (0.311)	-0.898 (1.29)	-0.399*** (0.085)
ipr_investment_mfn	-0.087 (0.065)	-0.203 (0.153)	-0.157 (0.296)	0.103 (1.42)	-0.054 (0.076)
ipr_investment_nt	0.373** (0.12)	0.6* (0.276)	0.83 (0.528)	0.91 (2.434)	0.407** (0.138)
ipr_assistance_coop_coordination	-0.156*** (0.024)	-0.18*** (0.054)	-0.137 (0.105)	0.198 (0.388)	-0.152*** (0.028)
ipr_general_enforcement	0.068** (0.026)	0.147* (0.059)	0.267* (0.112)	0.39 (0.356)	0.092** (0.029)
ipr_dispute_settlement_mechanism	-0.025 (0.034)	-0.141. (0.077)	-0.184 (0.176)	-0.104 (0.741)	-0.062 (0.039)
ipr_investment_dispute_settle-ment_mechanism	-0.049 (0.079)	-0.033 (0.189)	-0.074 (0.388)	-0.175 (1.549)	-0.045 (0.09)
ipr_investment_expropriation_exception	0.007 (0.05)	-0.12 (0.127)	-0.102 (0.253)	0.156 (1.073)	0.016 (0.059)
ipr_implementation	-0.055** (0.019)	-0.113** (0.044)	-0.141. (0.085)	-0.31 (0.293)	-0.123*** (0.023)
ipr_border_measures	-0.023 (0.024)	-0.43*** (0.061)	-0.724*** (0.123)	-0.411 (0.454)	0.041 (0.03)
ipr_m_copyrights_related_rights	0.004 (0.039)	0.084 (0.101)	0.225 (0.206)	0.193 (0.705)	0.044 (0.049)
ipr_m_trademarks	0.008 (0.046)	0.471** (0.151)	0.523. (0.293)	0.435 (0.98)	0.004 (0.059)
ipr_m_geo_indications	-0.001 (0.036)	0.006 (0.084)	-0.017 (0.163)	-0.243 (0.592)	-0.048 (0.042)
ipr_m_industrial_designs	0.01 (0.055)	-0.172 (0.127)	-0.201 (0.24)	-0.477 (0.797)	0.054 (0.064)
ipr_m_patents	0.228*** (0.05)	-0.044 (0.121)	-0.186 (0.237)	-0.112 (0.77)	0.25*** (0.057)
ipr_m_undisclosed_information	0.187*** (0.031)	0.239** (0.079)	0.223 (0.182)	0.189 (0.668)	0.26*** (0.046)
ipr_m_layout_design_integ_circuits	-0.294*** (0.041)	-0.46*** (0.093)	-0.574** (0.182)	-0.117 (0.706)	-0.314*** (0.047)
ipr_m_new_plant_varieties	-0.026 (0.023)	0.183** (0.057)	0.505*** (0.114)	0.839* (0.373)	-0.062* (0.029)

ipr_m_trad_knowledge_genetic_re-sources	0.068** (0.026)	0.202** (0.072)	0.183 (0.155)	0.484 (0.865)	0.106** (0.034)
ipr_m_encrypted_program_carrying_sat-ellite_signals	-0.067. (0.036)	-0.083 (0.085)	-0.158 (0.17)	-0.371 (0.696)	-0.098* (0.042)
ipr_m_domain_names	-0.013 (0.073)	0.283 (0.175)	0.45 (0.351)	0.343 (1.304)	0.103 (0.085)
Control Variables					
Democratisation (Polity 2) (mean)	-0.001 (0.001)	-0.008*** (0.002)	-0.017*** (0.004)	-0.053*** (0.014)	0 (0.001)
Classic IP leaders	-0.007 (0.015)	0.04 (0.033)	0.032 (0.062)	-0.254 (0.195)	-0.034* (0.017)
Countries with a high increase of patent protection	0.018 (0.013)	0.058* (0.029)	0.101. (0.054)	0.007 (0.191)	0.026. (0.015)
New IP producers and developers	-0.027. (0.016)	0.002 (0.036)	-0.063 (0.068)	-0.152 (0.278)	-0.043* (0.019)
ln Geographic distance (mean)	-0.004 (0.007)	-0.061*** (0.016)	-0.113*** (0.031)	-0.37*** (0.1)	-0.019* (0.008)
Intercept	0.156** (0.056)	0.926*** (0.126)	1.665*** (0.238)	4.792*** (0.767)	0.272*** (0.065)
Model	m5.1_bv_df_gi	m5.1_bv_df3l_gi	m5.1_bv_df5l_gi	m5.1_bv_df10l_gi	m5.1_bv_dft_gi
Observations	2970	2764	2653	2301	2786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDP II	First-comer IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables					
ipr_mentioned	-0.152*** (0.042)	-0.033 (0.094)	-0.223 (0.176)	0.288 (0.557)	-0.176*** (0.049)
ipr_1_article	0.147*** (0.045)	0.152 (0.1)	0.457* (0.187)	-0.032 (0.584)	0.087. (0.052)
ipr_more_than_1_article	-0.025 (0.064)	-0.075 (0.147)	-0.07 (0.275)	0.212 (0.885)	-0.002 (0.076)
ipr_mfn	-0.305*** (0.05)	-0.614*** (0.118)	-1.012*** (0.226)	-1.241. (0.749)	-0.243*** (0.059)
ipr_nt	-0.005 (0.043)	-0.064 (0.097)	0.069 (0.242)	-0.119 (0.83)	-0.03 (0.05)
ipr_as_investment	-0.296*** (0.09)	-0.535** (0.2)	-0.723. (0.373)	-0.926 (1.149)	-0.31** (0.105)
ipr_investment_mfn	0.113 (0.101)	0.298 (0.234)	0.326 (0.434)	0.289 (1.721)	0.184 (0.121)
ipr_investment_nt	0.195 (0.165)	0.075 (0.369)	-0.03 (0.688)	-0.59 (2.636)	0.191 (0.193)
ipr_assistance_coop_coordination	-0.07 (0.043)	0.084 (0.097)	0.35. (0.18)	0.463 (0.628)	-0.068 (0.051)
ipr_general_enforcement	0.206** (0.068)	0.491** (0.159)	0.541. (0.297)	1.083 (1.026)	0.253** (0.081)
ipr_dispute_settlement_mechanism	-0.058 (0.049)	-0.023 (0.112)	-0.009 (0.209)	-0.393 (0.758)	-0.089 (0.058)
ipr_investment_dispute_settle-ment_mechanism	-0.04 (0.105)	0.128 (0.235)	0.303 (0.44)	0.926 (1.763)	-0.037 (0.123)
ipr_investment_expropriation_exception	-0.024 (0.052)	-0.06 (0.139)	-0.154 (0.258)	0.171 (1.062)	-0.022 (0.069)
ipr_implementation	-0.084* (0.035)	-0.12 (0.079)	-0.196 (0.15)	-0.088 (0.517)	-0.051 (0.043)
ipr_border_measures	-0.089. (0.047)	-0.224* (0.11)	-0.32 (0.214)	-0.365 (0.973)	-0.154* (0.06)
ipr_m_copyrights_related_rights	-0.024 (0.064)	0.054 (0.143)	0.05 (0.269)	0.24 (0.858)	0.03 (0.076)
ipr_m_trademarks	0.141 (0.089)	-0.045 (0.206)	0.319 (0.384)	0.006 (1.283)	0.113 (0.104)
ipr_m_geo_indications	0.027 (0.073)	0.154 (0.169)	0.019 (0.317)	-0.595 (1.194)	-0.058 (0.086)
ipr_m_industrial_designs	0.23** (0.08)	0.227 (0.18)	-0.225 (0.347)	-0.506 (1.366)	0.195* (0.094)
ipr_m_patents	-0.005 (0.093)	0.186 (0.21)	0.036 (0.395)	-0.069 (1.561)	0.089 (0.108)
ipr_m_undisclosed_information	0.265*** (0.076)	0.295. (0.178)	0.572 (0.352)	0.24 (1.383)	0.302*** (0.091)
ipr_m_layout_design_integ_circuits	-0.55*** (0.055)	-0.649*** (0.13)	-0.555* (0.257)	0.464 (1.113)	-0.512*** (0.065)
ipr_m_new_plant_varieties	0.146*** (0.037)	0.222** (0.084)	0.458** (0.162)	0.496 (0.523)	0.073. (0.043)

ipr_m_trad_knowledge_genetic_resources	0.223*** (0.034)	0.324*** (0.079)	0.239 (0.15)	0.364 (0.907)	0.41*** (0.049)
ipr_m_encrypted_program_carrying_satellite_signals	0.018 (0.051)	-0.021 (0.116)	-0.137 (0.221)	0.186 (1.021)	0.211*** (0.061)
ipr_m_domain_names	0.154. (0.081)	0.2 (0.183)	0.241 (0.341)	0.086 (1.183)	0.149 (0.095)
Control Variables					
Democratisation (Polity 2) (mean)	0 (0.001)	-0.004. (0.002)	-0.011* (0.004)	-0.047*** (0.013)	0.002. (0.001)
Classic IP leaders	-0.024. (0.013)	-0.082** (0.03)	-0.141* (0.057)	-0.44* (0.185)	-0.007 (0.016)
Countries with a high increase of patent protection	0.012 (0.012)	0.046. (0.028)	0.085 (0.052)	0.001 (0.184)	0.016 (0.014)
New IP producers and developers	-0.006 (0.015)	0.048 (0.034)	-0.004 (0.065)	-0.074 (0.265)	-0.019 (0.018)
ln Geographic distance (mean)	-0.018** (0.007)	-0.093*** (0.016)	-0.154*** (0.03)	-0.436*** (0.099)	-0.038*** (0.008)
Intercept	0.268*** (0.053)	1.178*** (0.12)	1.983*** (0.231)	5.263*** (0.757)	0.435*** (0.062)
Model	m5.1_bv_fc_df_gi	m5.1_bv_fc_df3l_gi	m5.1_bv_fc_df5l_gi	m5.1_bv_fc_df10l_gi	m5.1_bv_fc_dft_gi
Observations	2970	2764	2653	2301	2786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDPpc I	Overall IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables					
ipr_mentioned	0.086*** (0.026)	0.12* (0.053)	0.122 (0.091)	0.065 (0.214)	0.096** (0.03)
ipr_1_article	0.001 (0.031)	-0.02 (0.063)	-0.103 (0.107)	-0.309 (0.282)	-0.022 (0.036)
ipr_more_than_1_article	-0.027 (0.028)	0.006 (0.058)	0.066 (0.101)	0.083 (0.272)	0.019 (0.032)
ipr_mfn	-0.024 (0.023)	0.103. (0.055)	0.252** (0.097)	-0.007 (0.248)	0.015 (0.029)
ipr_nt	-0.072* (0.029)	-0.245*** (0.067)	-0.193 (0.129)	-0.101 (0.368)	-0.168*** (0.036)
ipr_as_investment	-0.256*** (0.07)	-0.243. (0.144)	-0.484* (0.243)	-0.565 (0.761)	-0.358*** (0.08)
ipr_investment_mfn	-0.094 (0.061)	-0.194 (0.132)	-0.127 (0.231)	0.15 (0.838)	-0.063 (0.071)
ipr_investment_nt	0.37*** (0.112)	0.603* (0.239)	0.835* (0.412)	0.773 (1.436)	0.409** (0.13)
ipr_assistance_coop_coordination	-0.156*** (0.023)	-0.18*** (0.047)	-0.162* (0.082)	0.03 (0.229)	-0.153*** (0.026)
ipr_general_enforcement	0.061* (0.024)	0.117* (0.051)	0.209* (0.088)	0.308 (0.21)	0.087** (0.028)
ipr_dispute_settlement_mechanism	-0.023 (0.032)	-0.144* (0.067)	-0.176 (0.137)	-0.178 (0.437)	-0.06 (0.037)
ipr_investment_dispute_settle-ment_mechanism	-0.062 (0.074)	-0.061 (0.164)	-0.131 (0.303)	-0.345 (0.914)	-0.067 (0.085)
ipr_investment_expropriation_exception	0.007 (0.046)	-0.122 (0.11)	-0.107 (0.197)	0.163 (0.633)	0.019 (0.055)
ipr_implementation	-0.051** (0.017)	-0.097* (0.038)	-0.113. (0.067)	-0.286. (0.173)	-0.119*** (0.021)
ipr_border_measures	-0.018 (0.022)	-0.406*** (0.053)	-0.67*** (0.096)	-0.41 (0.268)	0.031 (0.029)
ipr_m_copyrights_related_rights	0.002 (0.036)	0.074 (0.088)	0.183 (0.161)	0.19 (0.416)	0.032 (0.046)
ipr_m_trademarks	0.031 (0.043)	0.542*** (0.131)	0.679** (0.228)	0.669 (0.578)	0.031 (0.055)
ipr_m_geo_indications	-0.009 (0.034)	-0.018 (0.073)	-0.078 (0.127)	-0.31 (0.349)	-0.053 (0.04)
ipr_m_industrial_designs	-0.01 (0.051)	-0.221* (0.11)	-0.259 (0.188)	-0.526 (0.47)	0.026 (0.06)
ipr_m_patents	0.197*** (0.046)	-0.128 (0.105)	-0.332. (0.185)	-0.368 (0.454)	0.215*** (0.053)
ipr_m_undisclosed_information	0.178*** (0.029)	0.216** (0.069)	0.214 (0.142)	0.218 (0.394)	0.254*** (0.043)
ipr_m_layout_design_integ_circuits	-0.24*** (0.038)	-0.318*** (0.08)	-0.347* (0.142)	0.206 (0.416)	-0.254*** (0.044)
ipr_m_new_plant_varieties	-0.034 (0.021)	0.128** (0.049)	0.359*** (0.089)	0.503* (0.22)	-0.067* (0.027)

ipr_m_trad_knowledge_genetic_resources	0.069** (0.024)	0.214*** (0.062)	0.242* (0.121)	0.587 (0.51)	0.106*** (0.032)
ipr_m_encrypted_program_carrying_satellite_signals	-0.068* (0.033)	-0.082 (0.074)	-0.163 (0.133)	-0.329 (0.41)	-0.1* (0.039)
ipr_m_domain_names	-0.021 (0.068)	0.245 (0.151)	0.398 (0.274)	0.256 (0.769)	0.083 (0.08)
Control Variables					
Democratisation (Polity 2) (mean)	0.001 (0.001)	-0.001 (0.002)	-0.003 (0.003)	-0.009 (0.008)	0.002. (0.001)
Classic IP leaders	-0.004 (0.014)	0.04 (0.029)	0.022 (0.049)	-0.274* (0.115)	-0.035* (0.016)
Countries with a high increase of patent protection	0.024* (0.012)	0.06* (0.025)	0.098* (0.042)	0.025 (0.113)	0.031* (0.014)
New IP producers and developers	-0.021 (0.015)	0.012 (0.031)	-0.036 (0.053)	-0.07 (0.164)	-0.035* (0.017)
ln Geographic distance (mean)	-0.012. (0.007)	-0.076*** (0.014)	-0.132*** (0.024)	-0.385*** (0.059)	-0.028*** (0.008)
Intercept	0.174*** (0.052)	0.918*** (0.109)	1.603*** (0.186)	4.307*** (0.453)	0.304*** (0.061)
Model	m5.2_bv_df_gi	m5.2_bv_df3l_gi	m5.2_bv_df5l_gi	m5.2_bv_df10l_gi	m5.2_bv_dft_gi
Observations	2970	2764	2653	2300	2786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDPpc II	First-comer IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables					
ipr_mentioned	-0.126** (0.039)	0.046 (0.082)	-0.051 (0.138)	0.501 (0.328)	-0.15** (0.046)
ipr_1_article	0.117** (0.042)	0.05 (0.087)	0.207 (0.146)	-0.484 (0.345)	0.059 (0.049)
ipr_more_than_1_article	-0.031 (0.06)	-0.094 (0.128)	-0.093 (0.216)	0.2 (0.522)	-0.012 (0.072)
ipr_mfn	-0.268*** (0.047)	-0.504*** (0.103)	-0.817*** (0.178)	-0.918* (0.442)	-0.211*** (0.056)
ipr_nt	0.007 (0.04)	-0.028 (0.084)	0.108 (0.19)	0.076 (0.49)	-0.017 (0.048)
ipr_as_investment	-0.279*** (0.084)	-0.502** (0.175)	-0.696* (0.292)	-0.887 (0.678)	-0.294** (0.099)
ipr_investment_mfn	0.087 (0.094)	0.247 (0.204)	0.248 (0.341)	0.133 (1.016)	0.155 (0.114)
ipr_investment_nt	0.214 (0.154)	0.156 (0.323)	0.159 (0.54)	-0.07 (1.555)	0.213 (0.183)
ipr_assistance_coop_coordination	-0.069. (0.04)	0.034 (0.084)	0.189 (0.141)	0.14 (0.37)	-0.064 (0.048)
ipr_general_enforcement	0.19** (0.063)	0.45** (0.139)	0.518* (0.233)	0.948 (0.606)	0.232** (0.076)
ipr_dispute_settlement_mechanism	-0.063 (0.046)	-0.046 (0.098)	-0.042 (0.164)	-0.437 (0.447)	-0.097. (0.055)
ipr_investment_dispute_settle-ment_mechanism	-0.047 (0.098)	0.114 (0.205)	0.258 (0.345)	0.734 (1.04)	-0.046 (0.116)
ipr_investment_expropriation_exception	-0.011 (0.049)	-0.015 (0.121)	-0.088 (0.203)	0.192 (0.627)	0.004 (0.065)
ipr_implementation	-0.08* (0.032)	-0.085 (0.069)	-0.106 (0.117)	0.084 (0.305)	-0.06 (0.04)
ipr_border_measures	-0.082. (0.044)	-0.231* (0.096)	-0.355* (0.167)	-0.393 (0.574)	-0.159** (0.057)
ipr_m_copyrights_related_rights	-0.022 (0.059)	0.048 (0.125)	0.07 (0.211)	0.25 (0.506)	0.033 (0.071)
ipr_m_trademarks	0.165* (0.083)	0.037 (0.18)	0.402 (0.301)	0.176 (0.757)	0.152 (0.099)
ipr_m_geo_indications	-0.003 (0.068)	0.082 (0.147)	-0.091 (0.249)	-0.696 (0.704)	-0.081 (0.081)
ipr_m_industrial_designs	0.204** (0.075)	0.186 (0.157)	-0.18 (0.272)	-0.311 (0.806)	0.167. (0.089)
ipr_m_patents	-0.028 (0.087)	0.091 (0.184)	-0.093 (0.31)	-0.265 (0.921)	0.051 (0.102)
ipr_m_undisclosed_information	0.253*** (0.071)	0.303. (0.156)	0.544* (0.276)	0.27 (0.816)	0.287*** (0.086)
ipr_m_layout_design_integ_circuits	-0.495*** (0.051)	-0.527*** (0.113)	-0.407* (0.202)	0.556 (0.657)	-0.456*** (0.061)
ipr_m_new_plant_varieties	0.13*** (0.034)	0.166* (0.073)	0.334** (0.127)	0.283 (0.309)	0.066 (0.041)

ipr_m_trad_knowledge_genetic_resources	0.217*** (0.031)	0.302*** (0.069)	0.223. (0.118)	0.292 (0.535)	0.389*** (0.046)
ipr_m_encrypted_program_carrying_satellite_signals	0.016 (0.047)	-0.014 (0.101)	-0.099 (0.174)	0.119 (0.602)	0.195*** (0.057)
ipr_m_domain_names	0.134. (0.076)	0.14 (0.16)	0.151 (0.267)	0.046 (0.698)	0.11 (0.09)
Control Variables					
Democratisation (Polity 2) (mean)	0.002* (0.001)	0.003 (0.002)	0.002 (0.003)	-0.004 (0.008)	0.004*** (0.001)
Classic IP leaders	-0.017 (0.012)	-0.066* (0.026)	-0.124** (0.045)	-0.414*** (0.109)	-0.008 (0.015)
Countries with a high increase of patent protection	0.018 (0.011)	0.05* (0.024)	0.087* (0.041)	0.022 (0.108)	0.02 (0.013)
New IP producers and developers	-0.001 (0.014)	0.05. (0.03)	0.008 (0.051)	-0.01 (0.156)	-0.013 (0.017)
ln Geographic distance (mean)	-0.024*** (0.006)	-0.105*** (0.014)	-0.171*** (0.024)	-0.442*** (0.058)	-0.046*** (0.008)
Intercept	0.275*** (0.049)	1.153*** (0.105)	1.908*** (0.181)	4.728*** (0.447)	0.458*** (0.059)
Model	m5.2_bv_fc_df_gi	m5.2_bv_fc_df3l_gi	m5.2_bv_fc_df5l_gi	m5.2_bv_fc_df10l_gi	m5.2_bv_fc_dft_gi
Observations	2970	2764	2653	2300	2786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDP Growth Rate	Overall IPR			First-comer IPR	
	df	*df5l*	*dft*	*df*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables					
ipr_mentioned	-0.349 (1.156)	0.17 (2.076)	-0.412 (1.456)	-0.086 (1.796)	-1.511 (2.255)
ipr_1_article	1.702 (1.369)	1.757 (2.444)	1.733 (1.722)	-0.816 (1.897)	0.645 (2.388)
ipr_more_than_1_article	-2.65* (1.234)	-4.113. (2.281)	-3.025. (1.553)	-0.478 (2.709)	0.186 (3.439)
ipr_mfn	-1.278 (1.01)	-1.869 (2.207)	-0.183 (1.423)	-1.421 (2.114)	2.136 (2.662)
ipr_nt	1.877 (1.29)	2.874 (2.918)	2.881. (1.743)	1.325 (1.841)	-0.379 (2.337)
ipr_as_investment	-0.364 (3.098)	-1.796 (5.543)	0.005 (3.903)	0.911 (3.886)	2.592 (4.888)
ipr_investment_mfn	-1.515 (2.658)	-1.924 (5.188)	-2.393 (3.425)	-9.594* (4.227)	-9.814. (5.461)
ipr_investment_nt	0.769 (4.918)	4.443 (9.286)	1.849 (6.251)	8 (6.993)	7.445 (8.822)
ipr_assistance_coop_coordination	0.734 (1)	1.305 (1.856)	0.526 (1.274)	-1.172 (1.8)	-3.434 (2.29)
ipr_general_enforcement	-0.068 (1.061)	1.038 (2)	0.399 (1.338)	1.275 (2.866)	1.659 (3.676)
ipr_dispute_settlement_mechanism	-0.932 (1.398)	0.977 (3.112)	0.651 (1.781)	-1.415 (2.093)	-1.821 (2.649)
ipr_investment_dispute_settle-ment_mechanism	-0.183 (3.23)	-1.136 (6.798)	-0.454 (4.066)	-0.324 (4.4)	-0.379 (5.551)
ipr_investment_expropriation_exception	1.378 (2.024)	-0.343 (4.436)	0.984 (2.647)	1.23 (2.186)	1.549 (3.115)
ipr_implementation	-0.91 (0.772)	-1.358 (1.526)	-1.498 (1.037)	0.415 (1.454)	0.035 (1.947)
ipr_border_measures	0.152 (0.978)	-1.232 (2.21)	-1.627 (1.393)	1.678 (1.963)	1.329 (2.712)
ipr_m_copyrights_related_rights	-0.268 (1.607)	-1.084 (3.63)	-0.347 (2.219)	0.471 (2.663)	0.581 (3.422)
ipr_m_trademarks	0.378 (1.899)	1.079 (5.136)	-0.311 (2.642)	-0.915 (3.738)	-0.957 (4.723)
ipr_m_geo_indications	0.709 (1.473)	1.315 (2.865)	1.151 (1.898)	-0.361 (3.054)	-0.534 (3.899)
ipr_m_industrial_designs	0.361 (2.214)	0.627 (4.136)	0.964 (2.841)	1.277 (3.252)	2.657 (4.091)
ipr_m_patents	0.378 (2.017)	-0.426 (4.144)	0.709 (2.548)	0.674 (3.851)	1.332 (4.846)
ipr_m_undisclosed_information	0.683 (1.279)	1.183 (3.194)	0.473 (2.08)	0.693 (3.176)	0.408 (4.115)
ipr_m_layout_design_integ_circuits	0.827 (1.685)	2.301 (3.184)	1.586 (2.124)	-0.652 (2.301)	-0.341 (2.921)
ipr_m_new_plant_varieties	-2.36* (0.94)	-4.186* (2.026)	-3.287* (1.323)	-0.611 (1.539)	-2.029 (1.962)

ipr_m_trad_knowledge_genetic_resources	-0.329 (1.065)	3.212 (2.747)	0.26 (1.547)	-0.495 (1.416)	0.377 (2.2)
ipr_m_encrypted_program_carrying_satellite_signals	-1.52 (1.479)	0.067 (3.045)	-0.554 (1.908)	-0.994 (2.131)	-0.918 (2.736)
ipr_m_domain_names	0.585 (2.988)	-2.96 (6.156)	-0.559 (3.829)	-1.071 (3.408)	-1.432 (4.308)
Control Variables					
Democratisation (Polity 2) (mean)	-0.048 (0.043)	-0.004 (0.077)	-0.057 (0.054)	-0.043 (0.042)	-0.046 (0.052)
Classic IP leaders	0.968 (0.61)	0.83 (1.111)	1.465. (0.772)	0.791 (0.55)	1.421* (0.718)
Countries with a high increase of patent protection	-0.508 (0.54)	-2.979** (0.972)	-0.391 (0.682)	-0.479 (0.528)	-0.347 (0.663)
New IP producers and developers	0.769 (0.674)	2.967* (1.22)	0.565 (0.854)	0.772 (0.65)	0.441 (0.817)
ln Geographic distance (mean)	0.15 (0.303)	-0.149 (0.557)	0.251 (0.387)	-0.022 (0.294)	0.06 (0.373)
Intercept	-1.345 (2.336)	0.208 (4.278)	-2.212 (2.977)	0.138 (2.269)	-0.517 (2.875)
Model	m5.3_bv_df_gi	m5.3_bv_df5l_gi	m5.3_bv_dft_gi	m5.3_bv_fc_df_gi	m5.3_bv_fc_dft_gi
Observations	2864	2544	2684	2864	2684

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDPpc Growth Rate	Overall IPR *df*	FC IPR *df5l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)
IPR General Binary Variables		
ipr_mentioned	1.464 (1.692)	4.138 (2.595)
ipr_1_article	-0.921 (1.998)	-8.035** (2.746)
ipr_more_than_1_article	0.242 (1.819)	1.642 (4.001)
ipr_mfn	0.418 (1.729)	4.277 (3.189)
ipr_nt	-3.159 (2.122)	-4.86. (2.69)
ipr_as_investment	-0.301 (4.569)	-21.236*** (5.606)
ipr_investment_mfn	1.116 (4.124)	3.381 (6.333)
ipr_investment_nt	-2.546 (7.485)	14.279 (10.118)
ipr_assistance_coop_coordination	-0.695 (1.485)	0.344 (2.633)
ipr_general_enforcement	0.465 (1.606)	1.332 (4.345)
ipr_dispute_settlement_mechanism	-0.323 (2.104)	-0.319 (3.093)
ipr_investment_dispute_settle-ment_mechanism	1.367 (5.096)	3.364 (6.368)
ipr_investment_expropriation_exception	1.18 (3.44)	1.853 (3.768)
ipr_implementation	1.402 (1.201)	8.376*** (2.147)
ipr_border_measures	3.014. (1.693)	-2.122 (3.044)
ipr_m_copyrights_related_rights	0.278 (2.765)	0.417 (3.888)
ipr_m_trademarks	-3.477 (4.074)	4.136 (5.587)
ipr_m_geo_indications	0.359 (2.267)	-4.759 (4.595)
ipr_m_industrial_designs	-3.128 (3.376)	10.026* (4.717)
ipr_m_patents	2.56 (3.254)	-1.161 (5.654)
ipr_m_undisclosed_information	1.575 (2.16)	-7.913 (4.834)
ipr_m_layout_design_integ_circuits	0.441 (2.497)	-6.244. (3.501)
ipr_m_new_plant_varieties	0.373 (1.561)	6.322** (2.268)

ipr_m_trad_knowledge_genetic_resources	-2.358 (1.957)	-3.013 (2.161)
ipr_m_encrypted_program_carrying_satellite_signals	3.211 (2.32)	-0.035 (3.155)
ipr_m_domain_names	-3.932 (4.714)	1.017 (4.956)
Control Variables		
Democratisation (Polity 2) (mean)	-0.009 (0.063)	-0.016 (0.061)
Classic IP leaders	-0.211 (0.905)	0.807 (0.824)
Countries with a high increase of patent protection	-0.341 (0.797)	-0.166 (0.77)
New IP producers and developers	0.284 (0.998)	0.086 (0.953)
ln Geographic distance (mean)	-0.891* (0.452)	-0.769. (0.433)
Intercept	6.305. (3.476)	5.342 (3.334)
Model	m5.4_bv_df3l_gi	m5.4_bv_fc_df3l_gi
Observations	2661	2661

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 63: Economic Effect Regression Tables of the Binary Variables for IPR Specific

Investment in R&D I	Overall IPR		
	df	*df5l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables			
ipr_special_requirements_related_border_measures	-0.313** (0.107)	0.137 (0.18)	-0.11. (0.06)
ipr_civil_administrative_procedures_remedies	0.347* (0.169)	-0.74** (0.254)	0.025 (0.115)
ipr_provisional_measure	0.072 (0.157)	0.301 (0.224)	0.035 (0.083)
ipr_criminal_procedures_remedies	-0.157 (0.131)	0.197 (0.148)	-0.078 (0.095)
ipr_service_provider_liability	0.037 (0.092)	-0.015 (0.366)	-0.032 (0.065)
ipr_committee	-0.024 (0.059)	-0.017 (0.065)	0.033 (0.03)
ipr_transparency	0.054 (0.082)	-0.016 (0.137)	0.017 (0.047)
ipr_t_copyrights_related_rights	0.002 (0.077)	-0.02 (0.15)	0.004 (0.046)
ipr_t_trademarks	-0.017 (0.085)	0.277** (0.097)	0.055 (0.042)
ipr_t_geo_indications	0.097 (0.063)	-0.17. (0.087)	0.002 (0.034)
ipr_t_industrial_designs	-0.049 (0.145)	0.103 (0.199)	0.121 (0.077)
ipr_t_patents	-0.03 (0.119)	0.14 (0.204)	-0.074 (0.074)
ipr_t_undisclosed_information	0.021 (0.068)	-0.062 (0.151)	-0.036 (0.041)
ipr_t_layout_design_integ_circuits	0.021 (0.342)	-0.528 (0.349)	-0.19 (0.168)
ipr_t_new_plant_varieties	-0.034 (0.089)	-0.214 (0.169)	-0.094. (0.056)
ipr_t_trad_knowledge_genetic_resources	-0.068 (0.09)	0.18 (0.195)	0.002 (0.063)
ipr_t_encrypted_program_carrying_satellite_signals	0.023 (0.193)	-0.032 (0.272)	0.141 (0.111)
ipr_t_domain_names	-0.123 (0.237)	-0.173 (0.483)	-0.001 (0.125)
Control Variables			
Democratisation (Polity 2) (mean)	-0.006. (0.003)	0.009** (0.003)	0.002 (0.002)
Classic IP leaders	0.123** (0.042)	0.176*** (0.045)	0.07*** (0.021)
Countries with a high increase of patent protection	0.005 (0.039)	0.013 (0.035)	-0.022 (0.019)

New IP producers and developers	0.04 (0.041)	0.165*** (0.044)	0.036. (0.02)
ln GDP	-0.005 (0.009)	0.008 (0.009)	0.002 (0.005)
ln GDPpc	-0.039* (0.017)	-0.08*** (0.018)	-0.026** (0.009)
ln Geographic distance (mean)	0.023 (0.019)	0.044* (0.021)	0.03** (0.009)
Intercept	0.319 (0.23)	0.195 (0.251)	-0.048 (0.114)
Model	m1_bv_df_si	m1_bv_df5l_si	m1_bv_dft_si
Observations	923	684	817

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Investment in R&D II	First-comer IPR	
	df	*df5l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables		
ipr_special_requirements_related_border_measures	0.207 (0.245)	-0.224. (0.118)
ipr_civil_administrative_procedures_remedies	-0.237 (0.546)	0.192 (0.181)
ipr_provisional_measure	0.12 (0.461)	0.045 (0.112)
ipr_criminal_procedures_remedies	-0.438* (0.216)	0.038 (0.072)
ipr_service_provider_liability	-0.144 (0.325)	-0.08 (0.071)
ipr_committee	0.061 (0.076)	0.079* (0.04)
ipr_transparency	-0.086 (0.218)	0.056 (0.067)
ipr_t_copyrights_related_rights	-0.003 (0.151)	-0.127 (0.09)
ipr_t_trademarks	0.45* (0.21)	-0.042 (0.084)
ipr_t_geo_indications	-0.025 (0.081)	-0.033 (0.042)
ipr_t_industrial_designs	0.156 (0.538)	-0.076 (0.083)
ipr_t_patents	0.12 (0.507)	0.005 (0.1)
ipr_t_undisclosed_information	-0.038 (0.087)	-0.066. (0.038)
ipr_t_layout_design_integ_circuits	NA	NA
ipr_t_new_plant_varieties	-0.305 (0.23)	0.072 (0.092)
ipr_t_trad_knowledge_genetic_resources	0.02 (0.078)	0.057 (0.072)
ipr_t_encrypted_program_carrying_satellite_signals	-0.4 (0.458)	-0.074 (0.177)
ipr_t_domain_names	0.151 (0.506)	0.179 (0.136)
Control Variables		
Democratisation (Polity 2) (mean)	0.007* (0.003)	0.002 (0.002)
Classic IP leaders	0.164*** (0.045)	0.071*** (0.021)
Countries with a high increase of patent protection	0.023 (0.035)	-0.021 (0.018)
New IP producers and developers	0.164*** (0.043)	0.028 (0.02)
ln GDP	0.01 (0.009)	-0.002 (0.005)

ln GDPpc	-0.074***	-0.021*
	(0.018)	(0.009)
ln Geographic distance (mean)	0.019	0.024**
	(0.019)	(0.008)
Intercept	0.266	0.069
	(0.232)	(0.106)
Model	m1_bv_fc_ df5l_si	m1_bv_fc_ dft_si
Observations	684	817

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Licensing	Overall IPR	
	df	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables		
ipr_special_requirements_related_border_measures	-2.776* (1.284)	-1.057 (1.782)
ipr_civil_administrative_procedures_remedies	1.059 (2.063)	-0.687 (2.887)
ipr_provisional_measure	-0.934 (1.878)	-1.229 (2.369)
ipr_criminal_procedures_remedies	-0.962 (1.396)	-1.799 (1.905)
ipr_service_provider_liability	-0.077 (0.832)	0.589 (1.542)
ipr_committee	0.062 (0.719)	0.126 (0.91)
ipr_transparency	-1.283 (1.124)	-1.183 (1.497)
ipr_t_copyrights_related_rights	1.671 (1.07)	2.271 (1.401)
ipr_t_trademarks	0.837 (0.918)	2.217. (1.209)
ipr_t_geo_indications	-0.221 (0.701)	-0.511 (0.889)
ipr_t_industrial_designs	2.321. (1.217)	3.217. (1.853)
ipr_t_patents	-0.043 (1.115)	0.172 (1.544)
ipr_t_undisclosed_information	0.611 (0.896)	-0.389 (1.302)
ipr_t_layout_design_integ_circuits	0.134 (1.107)	0.249 (2.041)
ipr_t_new_plant_varieties	-1.891. (1.133)	-3.538* (1.616)
ipr_t_trad_knowledge_genetic_resources	-0.311 (0.921)	-1.275 (1.693)
ipr_t_encrypted_program_carrying_satellite_signals	-0.184 (1.613)	-0.226 (1.981)
ipr_t_domain_names	2.366 (2.189)	1.249 (2.828)
Control Variables		
Democratisation (Polity 2) (mean)	-0.139** (0.047)	-0.118* (0.055)
Classic IP leaders	-0.4 (0.469)	-0.626 (0.555)
Countries with a high increase of patent protection	-0.173 (0.445)	-0.233 (0.52)
New IP producers and developers	-0.247 (0.474)	-0.224 (0.556)
ln GDP	-0.218. (0.119)	-0.287* (0.146)

ln GDPpc	0.101 (0.203)	0.155 (0.243)
ln Geographic distance (mean)	0.282 (0.235)	-0.045 (0.278)
Intercept	4.968. (2.912)	8.937* (3.542)
Model	m2.2_bv_df_si	m2.2_bv_dft_si
Observations	1542	1356

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Innovation: Researchers in R&D I	Overall IPR			
	df	*df3l*	*df5l*	*df10l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables				
ipr_special_requirements_related_border_measures	-0.114* (0.056)	-0.233 (0.15)	-0.16 (0.241)	-0.564 (1.303)
ipr_civil_administrative_procedures_remedies	-0.049 (0.083)	-0.402. (0.223)	-1.045** (0.336)	NA
ipr_provisional_measure	0.115 (0.078)	0.358. (0.199)	1.105*** (0.296)	0.798 (1.417)
ipr_criminal_procedures_remedies	0.029 (0.067)	0.254* (0.129)	0.194 (0.197)	NA
ipr_service_provider_liability	0.006 (0.046)	-0.196 (0.193)	0.144 (0.476)	0.423 (1.105)
ipr_committee	-0.016 (0.03)	0.04 (0.067)	0.036 (0.09)	0.388 (0.321)
ipr_transparency	-0.002 (0.041)	0.051 (0.131)	0.337. (0.179)	0.245 (0.538)
ipr_t_copyrights_related_rights	-0.036 (0.039)	0.134 (0.13)	0.115 (0.196)	-0.497 (0.68)
ipr_t_trademarks	-0.023 (0.042)	-0.034 (0.09)	0.319* (0.134)	0.712. (0.391)
ipr_t_geo_indications	-0.015 (0.032)	-0.044 (0.077)	-0.364** (0.121)	-0.891* (0.357)
ipr_t_industrial_designs	-0.002 (0.074)	0.041 (0.18)	-0.255 (0.261)	-0.807 (0.895)
ipr_t_patents	0.016 (0.059)	-0.058 (0.168)	0.385 (0.266)	0.609 (0.859)
ipr_t_undisclosed_information	0.003 (0.034)	-0.146 (0.131)	-0.159 (0.198)	0.497 (0.706)
ipr_t_layout_design_integ_circuits	-0.138 (0.166)	-0.178 (0.345)	-0.825. (0.455)	-0.773 (1.336)
ipr_t_new_plant_varieties	0 (0.045)	0.056 (0.162)	-0.145 (0.223)	NA
ipr_t_trad_knowledge_genetic_resources	-0.053 (0.045)	-0.039 (0.176)	-0.248 (0.254)	NA
ipr_t_encrypted_program_carrying_satellite_signals	-0.019 (0.095)	-0.079 (0.269)	-0.324 (0.356)	-0.605 (1.111)
ipr_t_domain_names	-0.101 (0.116)	0.157 (0.325)	-0.653 (0.629)	NA
Control Variables				
Democratisation (Polity 2) (mean)	0.002 (0.002)	-0.001 (0.005)	0.015* (0.006)	-0.027. (0.015)
Classic IP leaders	0.067** (0.023)	0.15*** (0.045)	0.131* (0.064)	0.074 (0.144)
Countries with a high increase of patent protection	-0.031 (0.021)	-0.004 (0.04)	-0.016 (0.052)	-0.035 (0.111)
New IP producers and developers	0.046* (0.022)	0.044 (0.048)	0.253*** (0.066)	-0.191 (0.185)
ln GDP	0 (0.005)	-0.003 (0.01)	-0.001 (0.013)	-0.019 (0.027)

ln GDPpc	-0.025* (0.01)	-0.092*** (0.02)	-0.101*** (0.028)	-0.069 (0.067)
ln Geographic distance (mean)	0.053*** (0.011)	0.083*** (0.022)	0.116*** (0.032)	0.154* (0.062)
Intercept	-0.119 (0.126)	0.503. (0.259)	0.239 (0.364)	0.89 (0.763)
Model	m3.1_bv_df_si	m3.1_bv_df3l_si	m3.1_bv_df5l_si	m3.1_bv_df10l_si
Observations	786	640	582	357

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Innovation: Researchers in R&D II	First-comer IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables					
ipr_special_requirements_related_border_measures	-0.113 (0.099)	-0.272 (0.247)	-0.05 (0.321)	1.319 (1.279)	-0.253. (0.148)
ipr_civil_administrative_procedures_remedies	0.081 (0.158)	0.266 (0.36)	-0.173 (0.721)	NA	0.367 (0.239)
ipr_provisional_measure	-0.049 (0.113)	-0.144 (0.257)	0.23 (0.615)	NA	-0.021 (0.164)
ipr_criminal_procedures_remedies	-0.069 (0.071)	-0.069 (0.123)	-0.206 (0.326)	NA	-0.046 (0.088)
ipr_service_provider_liability	-0.14. (0.072)	-0.225 (0.154)	-0.351 (0.422)	-0.051 (0.95)	-0.077 (0.097)
ipr_committee	-0.064 (0.043)	-0.15. (0.082)	-0.143 (0.109)	-0.538 (0.33)	-0.015 (0.051)
ipr_transparency	0.029 (0.068)	0.006 (0.145)	0.202 (0.286)	-0.475 (0.717)	-0.012 (0.094)
ipr_t_copyrights_related_rights	0.028 (0.067)	-0.118 (0.132)	-0.22 (0.201)	-0.77 (0.648)	-0.002 (0.119)
ipr_t_trademarks	0.021 (0.08)	0.133 (0.149)	0.151 (0.281)	-0.865 (1.126)	-0.057 (0.124)
ipr_t_geo_indications	0.029 (0.045)	-0.027 (0.081)	-0.024 (0.109)	-0.22 (0.181)	0.016 (0.053)
ipr_t_industrial_designs	-0.009 (0.097)	-0.107 (0.164)	-2.019** (0.706)	-5.41*** (1.268)	-0.221 (0.147)
ipr_t_patents	-0.001 (0.115)	NA	2.099** (0.66)	3.607** (1.134)	0.21 (0.169)
ipr_t_undisclosed_information	0.006 (0.039)	0.044 (0.086)	0.064 (0.114)	0.029 (0.173)	-0.038 (0.047)
ipr_t_layout_design_integ_circuits	NA	NA	NA	NA	NA
ipr_t_new_plant_varieties	-0.049 (0.086)	-0.052 (0.187)	-0.252 (0.321)	NA	-0.01 (0.139)
ipr_t_trad_knowledge_genetic_resources	-0.095* (0.042)	-0.004 (0.076)	-0.109 (0.104)	NA	0.021 (0.09)
ipr_t_encrypted_program_carrying_satellite_signals	-0.225 (0.178)	0.026 (0.397)	-0.05 (0.596)	NA	0.324 (0.249)
ipr_t_domain_names	0.032 (0.144)	-0.002 (0.338)	-0.109 (0.657)	NA	-0.132 (0.187)
Control Variables					
Democratisation (Polity 2) (mean)	0.001 (0.002)	0 (0.004)	0.015* (0.006)	-0.039** (0.015)	0.004 (0.003)
Classic IP leaders	0.068** (0.024)	0.162*** (0.046)	0.129. (0.066)	0.039 (0.136)	0.07* (0.029)
Countries with a high increase of patent protection	-0.012 (0.021)	0.004 (0.039)	-0.008 (0.05)	-0.068 (0.103)	-0.022 (0.024)
New IP producers and developers	0.068** (0.022)	0.125** (0.045)	0.308*** (0.064)	-0.04 (0.174)	0.058* (0.027)
ln GDP	-0.003 (0.005)	-0.01 (0.01)	-0.004 (0.013)	-0.018 (0.026)	-0.006 (0.006)

ln GDPpc	-0.029**	-0.098***	-0.098***	-0.03	-0.027*
	(0.011)	(0.02)	(0.028)	(0.063)	(0.013)
ln Geographic distance (mean)	0.028**	0.06**	0.077**	0.127*	0.018
	(0.01)	(0.02)	(0.028)	(0.056)	(0.012)
Intercept	0.183	0.883***	0.584.	0.785	0.307*
	(0.121)	(0.243)	(0.343)	(0.71)	(0.149)
Model	m3.1_bv_fc_df_si	m3.1_bv_fc_df3l_si	m3.1_bv_fc_df5l_si	m3.1_bv_fc_df10l_si	m3.1_bv_fc_dft_si
Observations	786	640	582	357	683

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: PTA Member Applications for Industrial Designs I	Overall IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables					
ipr_special_requirements_related_border_measures	4.636*** (1.205)	6.611. (3.437)	11.148* (5.09)	1.957 (7.714)	13.298 (36.014)
ipr_civil_administrative_procedures_remedies	-3.669. (2.111)	-5.89 (5.727)	-16.575* (7.028)	-26.37 (30.464)	-54.03 (57.603)
ipr_provisional_measure	3.756. (1.934)	1.801 (4.3)	10.109* (5.076)	51.269*** (12.405)	103.164* (43.936)
ipr_criminal_procedures_remedies	-4.504** (1.402)	-1.47 (3.204)	-14.099*** (3.848)	-26.387 (27.641)	3.077 (33.287)
ipr_service_provider_liability	-2.62*** (0.715)	-8.348*** (2.019)	-7.614 (5.384)	-149.634*** (23.784)	-39.931 (28.862)
ipr_committee	-1.51* (0.617)	-1.292 (1.607)	1.333 (1.866)	-13.398*** (3.24)	9.037 (12.884)
ipr_transparency	4.813*** (1.112)	6.376** (2.398)	17.798*** (3.168)	58.754*** (5.261)	9.829 (23.238)
ipr_t_copyrights_related_rights	-3.559*** (0.962)	-7.775*** (1.91)	-5.349 (3.75)	-17.638* (6.905)	-15.825 (23.494)
ipr_t_trademarks	2.617*** (0.756)	14.287*** (2.251)	4.646. (2.572)	5.059 (4.146)	4.872 (14.266)
ipr_t_geo_indications	-0.89 (0.653)	-15.069*** (2.035)	-7.415*** (2.208)	-7.579* (3.526)	-12.172 (14.191)
ipr_t_industrial_designs	4.265*** (1.068)	19.752*** (2.969)	-1.58 (5.428)	-50.872*** (10.87)	61.047. (32.767)
ipr_t_patents	-5.114*** (0.893)	-14.899*** (2.408)	10.5** (4.044)	56.774** (18.828)	18.779 (19.709)
ipr_t_undisclosed_information	3.269*** (0.814)	3.017. (1.737)	2.612 (3.668)	17.005* (7.201)	-8.468 (20.673)
ipr_t_layout_design_integ_circuits	5.162*** (0.893)	17.92*** (2.924)	-6.629 (4.348)	-55.598** (18.923)	-12.284 (24.327)
ipr_t_new_plant_varieties	-1.138 (0.996)	-5.144* (2.084)	-6.507 (4.327)	-1.864 (10.933)	-72.867* (29.359)
ipr_t_trad_knowledge_genetic_resources	-2.157** (0.777)	1.639 (1.935)	-1.091 (4.461)	NA	-82.645** (26.288)
ipr_t_encrypted_program_carrying_satellite_signals	9.456*** (1.559)	32.621*** (3.948)	76.183*** (9.006)	78.035*** (19.321)	-7.004 (28.812)
ipr_t_domain_names	-2.529 (1.731)	-6.557 (4.913)	-73.093*** (11.964)	NA	-47.471 (31.301)
Control Variables					
Democratisation (Polity 2) (mean)	0.097. (0.055)	0.078 (0.115)	0.05 (0.108)	-0.204 (0.139)	-6.436*** (1.212)
Classic IP leaders	0.423 (0.57)	-1.163 (1.096)	-1.831 (1.13)	-6.319*** (1.441)	5.667 (12.423)
Countries with a high increase of patent protection	-0.804 (0.6)	-2.589* (1.067)	-2.89** (1.043)	-2.534* (1.157)	14.519 (11.791)
New IP producers and developers	1.102. (0.565)	2.547* (1.058)	1.614 (1.118)	4.391** (1.537)	-20.514* (10.356)

ln GDP	0.182	0.358	0.22	0.327	7.727***
	(0.122)	(0.232)	(0.238)	(0.285)	(2.129)
ln GDPpc	-0.557*	-0.34	-0.396	1.034.	-12.451**
	(0.231)	(0.44)	(0.451)	(0.551)	(4.781)
ln Geographic distance (mean)	1.062***	2.202***	1.63**	3.797***	5.743
	(0.312)	(0.575)	(0.605)	(0.768)	(6.472)
Intercept	-7.858*	-20.872**	-11.975.	-39.236***	-64.126
	(3.54)	(6.724)	(6.944)	(9.126)	(77.786)
Model	m4.3_bv_df_si	m4.3_bv_df3l_si	m4.3_bv_df5l_si	m4.3_bv_df10l_si	m4.3_bv_dft_si
Observations	755	568	506	361	430

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: PTA Member Applications for Industrial Designs II	First-comer IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables					
ipr_special_requirements_related_border_measures	-0.363 (3.348)	0.347 (6.245)	0.477 (6.508)	-9.889 (10.104)	NA
ipr_civil_administrative_procedures_remedies	0.804 (4.59)	-8.185 (10.213)	-12.703 (11.276)	15.833 (25.094)	NA
ipr_provisional_measure	-0.643 (3.139)	8.364 (8.386)	15.496 (9.727)	-2.243 (22.859)	312.436*** (53.488)
ipr_criminal_procedures_remedies	-1.573 (1.753)	-1.229 (3.385)	1.623 (3.669)	NA	-4.781 (26.103)
ipr_service_provider_liability	-3.608* (1.518)	-10.112* (4.102)	-10.983* (4.756)	-1.34 (16.071)	-37.791 (41.709)
ipr_committee	-0.814 (0.85)	0.536 (1.746)	1.347 (1.855)	-0.327 (2.778)	0.025 (13.678)
ipr_transparency	2.128 (1.59)	8.018. (4.24)	11.546* (5.021)	-6.84 (18.525)	68.526 (45.646)
ipr_t_copyrights_related_rights	-0.97 (1.543)	-1.252 (3.308)	-1.061 (3.739)	-6.693 (8.038)	79.995 (78.367)
ipr_t_trademarks	1.381 (1.83)	-0.043 (3.756)	-6.615 (4.691)	3.623 (7.366)	15.241 (41.759)
ipr_t_geo_indications	-1.112 (1.111)	-2.9 (2.496)	-2.505 (2.696)	-1.75 (3.186)	-1.971 (19.452)
ipr_t_industrial_designs	-7.37** (2.738)	-6.854 (5.119)	-24.409* (11.212)	-3.468 (6.838)	-3.399 (38.845)
ipr_t_patents	8.523** (3.144)	6.614 (5.828)	19.424. (9.938)	NA	NA
ipr_t_undisclosed_information	-1.387 (0.988)	-1.753 (1.846)	-2.535 (2.436)	0.014 (2.794)	-2.057 (13.646)
ipr_t_layout_design_integ_circuits	2.454. (1.302)	-3.615 (7.79)	-5.332 (8.346)	-3.584 (13.618)	NA
ipr_t_new_plant_varieties	-1.593 (1.66)	1.766 (3.735)	12.175* (5.817)	4.775 (9.116)	-8.854 (34.513)
ipr_t_trad_knowledge_genetic_resources	-1.005 (1.075)	-3.58. (2.157)	-4.708. (2.525)	NA	-110.912. (61.255)
ipr_t_encrypted_program_carrying_satellite_signals	2.033 (2.986)	16.374* (8.165)	23.13** (8.841)	2.378 (15.402)	-304.717*** (85.957)
ipr_t_domain_names	9.634** (3.215)	6.462 (7.407)	0.282 (7.776)	NA	329.968*** (85.299)
Control Variables					
Democratisation (Polity 2) (mean)	0.035 (0.059)	0.055 (0.137)	0.026 (0.134)	-0.262 (0.191)	-5.935*** (1.145)
Classic IP leaders	0.344 (0.594)	0.322 (1.302)	-0.52 (1.406)	-5.872** (2.02)	-5.139 (11.74)
Countries with a high increase of patent protection	-1.145. (0.615)	-1.416 (1.226)	-2.43. (1.271)	-2.51 (1.557)	15.753 (10.948)
New IP producers and developers	0.102 (0.607)	0.409 (1.359)	-0.401 (1.38)	-2.052 (1.928)	-27.671** (9.975)

ln GDP	0.304* (0.125)	0.679* (0.267)	0.687* (0.289)	1.099** (0.392)	7.166*** (2)
ln GDPpc	-0.686** (0.248)	-0.71 (0.53)	-0.785 (0.567)	-0.017 (0.758)	-11.489* (4.813)
ln Geographic distance (mean)	1.361*** (0.289)	2.448*** (0.597)	2.964*** (0.712)	5.158*** (0.944)	4.657 (4.657)
Intercept	-11.193*** (3.357)	-28.515*** (7.279)	-30.852*** (8.116)	-58.676*** (11.899)	-45.977 (63.416)
Model	m4.3_bv_fc_df_si	m4.3_bv_fc_df3l_si	m4.3_bv_fc_df5l_si	m4.3_bv_fc_df10l_si	m4.3_bv_fc_dft_si
Observations	755	568	506	361	430

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: PTA Member Applications for Patents I	Overall IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables					
ipr_special_requirements_related_border_measures	-1.462 (38.618)	-19.399 (25.063)	-56.488 (41.992)	-4.494 (15.986)	48.013 (98.432)
ipr_civil_administrative_procedures_remedies	-81.708 (63.379)	-15.712 (37.964)	-25.668 (61.034)	-231.243*** (36.471)	-209.295 (180.267)
ipr_provisional_measure	75.982 (57.941)	43.378. (26.092)	120.566** (45.489)	201.136*** (23.153)	106.815 (121.998)
ipr_criminal_procedures_remedies	-42.903 (43.484)	-22.766 (21.201)	-61.118 (38.048)	99.073*** (21.884)	127.516 (103.338)
ipr_service_provider_liability	4.269 (23.171)	9.981 (13.702)	12.513 (49.846)	-87.088*** (21.968)	84.195 (79.396)
ipr_committee	-3.9 (19.999)	-0.753 (10.712)	4.218 (19.684)	-18.27* (7.984)	-82.099* (37.329)
ipr_transparency	89.701** (34.384)	45.088** (15.937)	131.058*** (34.434)	141.692*** (15.17)	-38.944 (74.851)
ipr_t_copyrights_related_rights	8.989 (29.013)	0.539 (12.789)	-20.641 (33.009)	17.766. (10.04)	-140.495* (64.977)
ipr_t_trademarks	-20.15 (24.458)	-20.195 (14.689)	-28.574 (25.285)	0.404 (8.871)	0.198 (45.065)
ipr_t_geo_indications	15.056 (20.293)	17.581 (12.818)	15.544 (21.406)	-6.856 (7.67)	54.755 (41.799)
ipr_t_industrial_designs	-25.761 (33.571)	-31.874 (20.359)	-134.98** (45.721)	-118.358*** (15.065)	-273.226** (92.56)
ipr_t_patents	-15.384 (29.616)	5.527 (17.18)	89.854* (40.39)	89.442*** (14.504)	-44.756 (65.474)
ipr_t_undisclosed_information	4.693 (25.831)	8.735 (11.784)	28.851 (33.471)	-25.436* (10.247)	389.778*** (58.395)
ipr_t_layout_design_integ_circuits	-5.245 (30.127)	-16.221 (21.27)	-111.193** (42.287)	-91.189*** (14.597)	45 (78.387)
ipr_t_new_plant_varieties	42.206 (31.247)	28.067. (14.878)	52.727 (39.819)	34.932* (14.553)	273.88*** (76.919)
ipr_t_trad_knowledge_genetic_resources	-21.929 (25.445)	-23.538. (14.212)	-38.255 (41.77)	NA	59.329 (78.943)
ipr_t_encrypted_program_carrying_satellite_signals	82.206. (48.885)	38.011 (25.832)	90.811 (56.413)	-75.069*** (18.151)	-12.945 (86.088)
ipr_t_domain_names	338.054*** (56.598)	76.776* (30.75)	-1.632 (78.997)	NA	45.693 (106.881)
Control Variables					
Democratisation (Polity 2) (mean)	0.19 (1.905)	0.141 (0.81)	-0.127 (1.215)	0.227 (0.337)	7.703. (4.038)
Classic IP leaders	24.086 (19.269)	9.788 (7.698)	0.953 (12.332)	-0.901 (3.434)	30.627 (37.13)
Countries with a high increase of patent protection	-2.271 (17.985)	-4.644 (7.269)	-7.762 (10.965)	-2.842 (2.919)	4.049 (31.231)
New IP producers and developers	-13.755 (17.457)	-1.76 (6.997)	-10.103 (11.391)	-4.306 (3.642)	128.529*** (30.404)

ln GDP	8.598* (3.678)	4.235** (1.544)	5.381* (2.468)	0.463 (0.66)	20.041*** (6.003)
ln GDPpc	-0.413 (6.991)	-0.668 (2.909)	2.44 (4.6)	1.156 (1.307)	-2.025 (13.146)
ln Geographic distance (mean)	17.042. (9.427)	8.266* (3.966)	10.02 (6.153)	7.645*** (1.845)	11.283 (16.738)
Intercept	-365.505** (112.553)	- 172.262*** (48.935)	-234.091** (74.348)	-77.599*** (22.564)	-694.774** (214.797)
Model	m4.4_bv_df_si	m4.4_bv_df3l_si	m4.4_bv_df5l_si	m4.4_bv_df10l_si	m4.4_bv_dft_si
Observations	980	796	721	521	622

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: PTA Member Applications for Patents II	First-comer IPR *df3l*	*df5l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables		
ipr_special_requirements_related_border_measures	19.216 (39.866)	11.019 (73.658)
ipr_civil_administrative_procedures_remedies	-40.558 (57.042)	-27.869 (98.296)
ipr_provisional_measure	27.259 (35.913)	29.621 (63.482)
ipr_criminal_procedures_remedies	2.07 (23.628)	4.009 (38.29)
ipr_service_provider_liability	-15.625 (27.78)	-14.586 (46.924)
ipr_committee	-1.308 (12.106)	-4.022 (19.133)
ipr_transparency	4.958 (27.042)	4.344 (46.563)
ipr_t_copyrights_related_rights	-0.678 (21.781)	-7.907 (37.71)
ipr_t_trademarks	25.087 (26.775)	20.965 (48.849)
ipr_t_geo_indications	-8.831 (14.346)	-17.918 (22.865)
ipr_t_industrial_designs	4.407 (30.847)	20.866 (92.121)
ipr_t_patents	-15.823 (37.287)	-42.071 (81.623)
ipr_t_undisclosed_information	-7.371 (12.937)	-13.07 (24.595)
ipr_t_layout_design_integ_circuits	-22.3 (53.04)	-39.913 (85.682)
ipr_t_new_plant_varieties	-9.06 (24.66)	13.984 (61.991)
ipr_t_trad_knowledge_genetic_resources	-30.031* (14.874)	-44.636. (23.478)
ipr_t_encrypted_program_carrying_satellite_signals	-7.212 (40.48)	21.337 (76.301)
ipr_t_domain_names	-25.052 (40.874)	-55.898 (71.198)
Control Variables		
Democratisation (Polity 2) (mean)	0.045 (0.866)	0.044 (1.329)
Classic IP leaders	10.777 (8.227)	9.736 (13.292)
Countries with a high increase of patent protection	-16.412* (7.595)	-26.215* (11.619)
New IP producers and developers	-1.428 (7.627)	-9.115 (12.004)
ln GDP	7.551*** (1.615)	10.581*** (2.632)

ln GDPpc	-0.369 (3.177)	0.416 (5.091)
ln Geographic distance (mean)	20.256*** (3.739)	31.051*** (6.045)
Intercept	-347.852*** (47.798)	-507.233*** (73.836)
Model	m4.4_bv_fc_df3l_si	m4.4_bv_fc_df5l_si
Observations	796	721

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: Total *htp* Imports	Overall IPR		First-comer IPR	
	df	*df10l*	*df*	*df10l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables				
ipr_special_requirements_related_border_measures	-1.703. (0.956)	0 (0)	-0.956 (1.859)	0 (0)
ipr_civil_administrative_procedures_remedies	-0.53 (1.62)	0 (0)	-1.425 (2.693)	0 (0)
ipr_provisional_measure	-0.003 (1.313)	0. (0)	-0.825 (1.492)	0** (0)
ipr_criminal_procedures_remedies	1.6 (1.141)	NA	1.691 (1.91)	NA
ipr_service_provider_liability	-0.109 (1.083)	0 (0)	-0.098 (1.647)	0 (0)
ipr_committee	-0.098 (0.677)	0 (0)	-1.293 (0.826)	0 (0)
ipr_transparency	0.197 (0.828)	0 (0)	-0.4 (1.088)	0 (0)
ipr_t_copyrights_related_rights	0.542 (0.902)	0 (0)	-0.071 (1.346)	0 (0)
ipr_t_trademarks	0.347 (1.023)	0 (0)	-1.547 (1.434)	0 (0)
ipr_t_geo_indications	0.287 (0.561)	0 (0)	3.205*** (0.956)	0 (0)
ipr_t_industrial_designs	0.015 (1.094)	0 (0)	-0.108 (1.373)	0** (0)
ipr_t_patents	-0.169 (1.043)	0 (0)	0.764 (1.677)	0 (0)
ipr_t_undisclosed_information	-0.544 (0.92)	0 (0)	0.02 (1.343)	0 (0)
ipr_t_layout_design_integ_circuits	0.56 (2.24)	0 (0)	1.323 (3.046)	0 (0)
ipr_t_new_plant_varieties	-0.133 (1.236)	0 (0)	-0.155 (1.34)	0 (0)
ipr_t_trad_knowledge_genetic_resources	0.967 (1.033)	0 (0)	2.675** (1.008)	0 (0)
ipr_t_encrypted_program_carrying_satellite_signals	-0.706 (1.2)	0 (0)	0.663 (1.7)	0 (0)
ipr_t_domain_names	0.172 (1.562)	NA	0 (2.25)	NA
Control Variables				
Democratisation (Polity 2) (mean)	0.048 (0.03)	0 (0)	0.056. (0.03)	0 (0)
Classic IP leaders	-0.11 (0.535)	0*** (0)	-0.437 (0.479)	0*** (0)
Countries with a high increase of patent protection	-0.12 (0.337)	0 (0)	-0.246 (0.326)	0 (0)
New IP producers and developers	0.677. (0.346)	0 (0)	0.804* (0.33)	0 (0)
ln GDP	0.275** (0.106)	0*** (0)	0.291** (0.104)	0*** (0)

ln GDPpc	-0.537**	0**	-0.513**	0***
	(0.172)	(0)	(0.171)	(0)
ln Geographic distance (mean)	-0.045	0**	-0.091	0*
	(0.186)	(0)	(0.18)	(0)
Intercept	-2	-1***	-2.288	-1***
	(2.201)	(0)	(2.062)	(0)
Model	m4.5_bv_df_si	m4.5_bv_df10l_si	m4.5_bv_fc_df_si	m4.5_bv_fc_df10l_si
Observations	623	203	623	203

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: Total *mltp* Imports	Overall IPR *dft*	FC IPR *df*
Variables	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables		
ipr_special_requirements_related_border_measures	0 (0)	-0.169 (0.268)
ipr_civil_administrative_procedures_remedies	0 (0)	-0.061 (0.388)
ipr_provisional_measure	0 (0)	-0.136 (0.215)
ipr_criminal_procedures_remedies	0 (0)	0.114 (0.275)
ipr_service_provider_liability	0 (0)	-0.087 (0.237)
ipr_committee	0. (0)	-0.17 (0.119)
ipr_transparency	0 (0)	0.033 (0.157)
ipr_t_copyrights_related_rights	0 (0)	0.011 (0.194)
ipr_t_trademarks	0 (0)	-0.055 (0.207)
ipr_t_geo_indications	0 (0)	0.23. (0.138)
ipr_t_industrial_designs	0 (0)	-0.086 (0.198)
ipr_t_patents	0 (0)	0.156 (0.241)
ipr_t_undisclosed_information	0 (0)	0.077 (0.193)
ipr_t_layout_design_integ_circuits	0 (0)	-0.264 (0.439)
ipr_t_new_plant_varieties	0 (0)	-0.151 (0.193)
ipr_t_trad_knowledge_genetic_resources	0 (0)	0.258. (0.145)
ipr_t_encrypted_program_carrying_satellite_signals	0 (0)	0.056 (0.245)
ipr_t_domain_names	0 (0)	0.063 (0.324)
Control Variables		
Democratisation (Polity 2) (mean)	0 (0)	0.01* (0.004)
Classic IP leaders	0** (0)	-0.039 (0.069)
Countries with a high increase of patent protection	0 (0)	0.005 (0.047)
New IP producers and developers	0 (0)	0.059 (0.048)
ln GDP	0*** (0)	0.017 (0.015)

ln GDPpc	0 (0)	-0.079** (0.025)
ln Geographic distance (mean)	0. (0)	0.024 (0.026)
Intercept	-1*** (0)	0.2 (0.297)
Model	m4.7_bv_dft_si	m4.7_bv_fc_df_si
Observations	279	623

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: Total *ltp* Imports	Overall IPR *df*
Variables	Estimates (Std. Error)
IPR Specific Binary Variables	
ipr_special_requirements_related_border_measures	21744.8* (8430.1)
ipr_civil_administrative_procedures_remedies	8934.7 (15879.1)
ipr_provisional_measure	-20386.4. (11083.7)
ipr_criminal_procedures_remedies	-12285.4 (11050)
ipr_service_provider_liability	-23964.7 (16724.5)
ipr_committee	2932.7 (5238.3)
ipr_transparency	-4381.5 (7052.6)
ipr_t_copyrights_related_rights	5477.4 (9590)
ipr_t_trademarks	2771.6 (9192.7)
ipr_t_geo_indications	-6398.8 (4671.8)
ipr_t_industrial_designs	20262.7. (12072.6)
ipr_t_patents	-8916.5 (12068.9)
ipr_t_undisclosed_information	-7132.4 (10192.7)
ipr_t_layout_design_integ_circuits	-3181 (16037.6)
ipr_t_new_plant_varieties	-24180.4. (13132.1)
ipr_t_trad_knowledge_genetic_resources	3057 (10323.8)
ipr_t_encrypted_program_carrying_satellite_signals	-7169.5 (11629.4)
ipr_t_domain_names	35448.1 (22523.2)
Control Variables	
Democratisation (Polity 2) (mean)	217.7 (227.6)
Classic IP leaders	2628.1 (4100)
Countries with a high increase of patent protection	-1746.3 (2275.8)
New IP producers and developers	890.8 (2442.1)
ln GDP	1190 (747)

ln GDPpc	1068 (1209.4)
ln Geographic distance (mean)	-3270.5* (1338.7)
Intercept	-11905.8 (15678.9)
Model	m4.8_bv_df _si
Observations	462

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: PTA Member *htp* Imports	Overall IPR		
	d3l	*df5l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables			
ipr_special_requirements_related_border_measures	129091285** (49060265)	128993805** (42242343)	70985530* (29445556)
ipr_civil_administrative_procedures_remedies	56127598 (90419400)	116849721 (77298114)	62305631 (50171825)
ipr_provisional_measure	-82804794 (63516561)	-108929927* (53004247)	-66355499 (40582763)
ipr_criminal_procedures_remedies	-72713738 (64596909)	-88156578. (53321513)	-50781558 (36562357)
ipr_service_provider_liability	-42342750 (65484496)	-110224159 (67864779)	-28683640 (35233747)
ipr_committee	-1075771 (32437167)	-14844654 (25602750)	-6111340 (20739707)
ipr_transparency	54601924 (40417220)	73418745. (37589118)	47269883. (25152584)
ipr_t_copyrights_related_rights	-81077803 (51303514)	-112344783** (41975585)	-57188919* (27001025)
ipr_t_trademarks	-36358111 (51167806)	-33961839 (42953325)	-32068790 (30448469)
ipr_t_geo_indications	4646064 (27604433)	-98899 (21938802)	2001935 (16763017)
ipr_t_industrial_designs	61128829 (64291942)	10901004 (61198901)	55928059 (37910998)
ipr_t_patents	-33720655 (62029151)	-21440864 (63097598)	-17986632 (33981847)
ipr_t_undisclosed_information	-17526666 (50487318)	34603405 (46677215)	-9990175 (30722048)
ipr_t_layout_design_integ_circuits	-10538704 (93388455)	-3358200 (75673339)	-18964598 (62182369)
ipr_t_new_plant_varieties	-37604446 (64844732)	-71558179 (60163196)	-26375120 (39389588)
ipr_t_trad_knowledge_genetic_resources	127186236* (54265011)	182118325*** (53757271)	86904564** (33040289)
ipr_t_encrypted_program_carrying_satellite_signals	34712659 (62368176)	51749280 (61010870)	32643046 (36317942)
ipr_t_domain_names	60035873 (83765590)	95707635 (100748891)	27774636 (48438528)
Control Variables			
Democratisation (Polity 2) (mean)	-1622803 (1457846)	-2212636* (1108490)	-1143653 (952097)
Classic IP leaders	-22037598 (25143313)	2310638 (19909873)	-5903989 (16558008)
Countries with a high increase of patent protection	-6578935 (14562309)	-4133531 (11843610)	-6465344 (10117790)
New IP producers and developers	-29776675* (15057944)	-16306636 (13085419)	-17698470. (10484227)
ln GDP	19540593*** (4761966)	9037603* (3746670)	9361312** (3207949)

ln GDPpc	-17567302* (7697656)	-1595961 (5998422)	-4145628 (5182541)
ln Geographic distance (mean)	9850427 (8566787)	-1059104 (6753114)	5193975 (5686844)
Intercept	-386262548*** (101258014)	-184536286* (78983744)	-219022470** (67124990)
Model	m4.9_bv_df3l_si	m4.9_bv_df5l_si	m4.9_bv_dft_si
Observations	516	466	576

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDP I		Overall IPR	
	df	*df3l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables			
ipr_special_requirements_related_border_measures	0.039 (0.053)	0.064 (0.168)	-0.012 (0.075)
ipr_civil_administrative_procedures_remedies	-0.233** (0.086)	-0.132 (0.26)	-0.171 (0.123)
ipr_provisional_measure	0.003 (0.077)	-0.189 (0.197)	0.066 (0.097)
ipr_criminal_procedures_remedies	0.089 (0.057)	0.097 (0.148)	0.076 (0.077)
ipr_service_provider_liability	0.048 (0.035)	-0.13 (0.111)	-0.105. (0.064)
ipr_committee	-0.047 (0.029)	-0.156* (0.078)	-0.088* (0.036)
ipr_transparency	-0.001 (0.045)	0.096 (0.115)	0.087 (0.06)
ipr_t_copyrights_related_rights	-0.068 (0.045)	-0.005 (0.114)	-0.124* (0.059)
ipr_t_trademarks	0.036 (0.039)	0.019 (0.117)	0.098. (0.051)
ipr_t_geo_indications	-0.039 (0.028)	-0.061 (0.089)	-0.017 (0.036)
ipr_t_industrial_designs	-0.044 (0.049)	0.027 (0.158)	0.084 (0.076)
ipr_t_patents	0.062 (0.046)	-0.233. (0.141)	-0.085 (0.064)
ipr_t_undisclosed_information	0.012 (0.038)	0.048 (0.098)	0.023 (0.055)
ipr_t_layout_design_integ_circuits	-0.065 (0.046)	0.05 (0.159)	0.077 (0.08)
ipr_t_new_plant_varieties	0.089. (0.046)	0.028 (0.123)	0.027 (0.066)
ipr_t_trad_knowledge_genetic_resources	0.033 (0.039)	0.03 (0.111)	0.024 (0.071)
ipr_t_encrypted_program_carrying_satellite_signals	0.045 (0.065)	0.12 (0.176)	0.178* (0.081)
ipr_t_domain_names	0.063 (0.091)	0.412 (0.269)	0.148 (0.119)
Control Variables			
Democratisation (Polity 2) (mean)	0 (0.001)	-0.007** (0.002)	0.001 (0.001)
Classic IP leaders	0.017 (0.014)	0.039 (0.031)	0.017 (0.016)
Countries with a high increase of patent protection	0.005 (0.013)	0.013 (0.029)	0.007 (0.015)
New IP producers and developers	-0.011 (0.017)	0.052 (0.037)	-0.021 (0.02)
ln Geographic distance (mean)	-0.002 (0.007)	-0.037* (0.016)	-0.024** (0.009)

Intercept	0.16** (0.056)	0.797*** (0.126)	0.346*** (0.066)
Model	m5.1_bv_df_si	m5.1_bv_df3l_si	m5.1_bv_dft_si
Observations	2970	2764	2786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDP II	First-comer IPR			
	df	*df3l*	*df5l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables				
ipr_special_requirements_related_border_measures	-0.032 (0.112)	0.032 (0.247)	0.05 (0.489)	-0.08 (0.142)
ipr_civil_administrative_procedures_remedies	-0.183 (0.153)	-0.091 (0.348)	-0.233 (0.666)	-0.128 (0.191)
ipr_provisional_measure	0.116 (0.098)	-0.122 (0.227)	-0.036 (0.457)	0.123 (0.119)
ipr_criminal_procedures_remedies	0.108 (0.077)	0.109 (0.176)	0.069 (0.329)	0.115 (0.101)
ipr_service_provider_liability	-0.094 (0.075)	-0.509** (0.189)	-0.952** (0.357)	-0.204* (0.096)
ipr_committee	-0.027 (0.04)	-0.199* (0.094)	-0.278 (0.175)	-0.04 (0.047)
ipr_transparency	0.046 (0.064)	0.161 (0.154)	0.268 (0.289)	0.097 (0.08)
ipr_t_copyrights_related_rights	-0.098 (0.074)	-0.039 (0.174)	0.068 (0.33)	-0.107 (0.101)
ipr_t_trademarks	0.065 (0.082)	-0.06 (0.19)	-0.279 (0.362)	0.042 (0.098)
ipr_t_geo_indications	0.034 (0.045)	0.09 (0.113)	0.138 (0.208)	0.01 (0.054)
ipr_t_industrial_designs	-0.127 (0.091)	-0.11 (0.202)	-0.244 (0.485)	-0.123 (0.11)
ipr_t_patents	0.12 (0.104)	0.134 (0.231)	0.238 (0.469)	0.202 (0.125)
ipr_t_undisclosed_information	-0.047 (0.049)	-0.085 (0.113)	0.106 (0.254)	-0.09 (0.059)
ipr_t_layout_design_integ_circuits	-0.163* (0.068)	-0.032 (0.237)	-0.148 (0.457)	-0.08 (0.131)
ipr_t_new_plant_varieties	0.07 (0.072)	-0.065 (0.17)	0.029 (0.393)	0.041 (0.09)
ipr_t_trad_knowledge_genetic_resources	-0.014 (0.048)	-0.151 (0.112)	-0.381. (0.21)	0.083 (0.085)
ipr_t_encrypted_program_carrying_satellite_signals	0.081 (0.1)	0.183 (0.227)	0.288 (0.461)	0.408*** (0.118)
ipr_t_domain_names	0.071 (0.128)	0.45 (0.287)	0.603 (0.58)	-0.054 (0.153)
Control Variables				
Democratisation (Polity 2) (mean)	-0.001 (0.001)	-0.008*** (0.002)	-0.016*** (0.004)	0.001 (0.001)
Classic IP leaders	-0.008 (0.013)	-0.013 (0.03)	0.001 (0.057)	0.007 (0.016)
Countries with a high increase of patent protection	0.01 (0.013)	0.018 (0.029)	0.03 (0.054)	0.009 (0.015)
New IP producers and developers	-0.014 (0.017)	0.058 (0.037)	0.033 (0.069)	-0.021 (0.019)
ln Geographic distance (mean)	-0.009 (0.007)	-0.054*** (0.016)	-0.085** (0.03)	-0.029*** (0.008)

Intercept	0.206*** (0.055)	0.923*** (0.123)	1.502*** (0.232)	0.381*** (0.064)
Model	m5.1_bv_fc_df_si	m5.1_bv_fc_df3l_si	m5.1_bv_fc_df5l_si	m5.1_bv_fc_dft_si
Observations	2970	2764	2653	2786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDPpc I	Overall IPR		
	df	*df3l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables			
ipr_special_requirements_related_border_measures	0.049 (0.049)	0.102 (0.146)	-0.001 (0.071)
ipr_civil_administrative_procedures_remedies	-0.228** (0.08)	-0.126 (0.226)	-0.163 (0.116)
ipr_provisional_measure	0.001 (0.071)	-0.202 (0.171)	0.056 (0.092)
ipr_criminal_procedures_remedies	0.091. (0.052)	0.095 (0.128)	0.068 (0.072)
ipr_service_provider_liability	0.045 (0.033)	-0.128 (0.096)	-0.097 (0.06)
ipr_committee	-0.043 (0.027)	-0.15* (0.068)	-0.075* (0.034)
ipr_transparency	0 (0.041)	0.099 (0.1)	0.088 (0.056)
ipr_t_copyrights_related_rights	-0.072. (0.042)	-0.028 (0.099)	-0.122* (0.056)
ipr_t_trademarks	0.035 (0.036)	0.039 (0.102)	0.095. (0.048)
ipr_t_geo_indications	-0.032 (0.026)	-0.06 (0.077)	-0.013 (0.034)
ipr_t_industrial_designs	-0.05 (0.046)	0.03 (0.137)	0.072 (0.071)
ipr_t_patents	0.064 (0.043)	-0.229. (0.122)	-0.064 (0.06)
ipr_t_undisclosed_information	0.016 (0.035)	0.057 (0.085)	0.018 (0.052)
ipr_t_layout_design_integ_circuits	-0.068 (0.043)	0.047 (0.138)	0.052 (0.076)
ipr_t_new_plant_varieties	0.095* (0.042)	0.035 (0.107)	0.024 (0.062)
ipr_t_trad_knowledge_genetic_resources	0.036 (0.036)	0.046 (0.097)	0.02 (0.067)
ipr_t_encrypted_program_carrying_satellite_signals	0.042 (0.06)	0.092 (0.153)	0.149* (0.076)
ipr_t_domain_names	0.039 (0.084)	0.375 (0.233)	0.11 (0.112)
Control Variables			
Democratisation (Polity 2) (mean)	0.002. (0.001)	0.001 (0.002)	0.003** (0.001)
Classic IP leaders	0.018 (0.013)	0.036 (0.027)	0.011 (0.015)
Countries with a high increase of patent protection	0.011 (0.012)	0.021 (0.025)	0.013 (0.014)
New IP producers and developers	-0.005 (0.015)	0.056. (0.032)	-0.014 (0.018)
ln Geographic distance (mean)	-0.011 (0.007)	-0.058*** (0.014)	-0.034*** (0.008)

Intercept	0.186*** (0.052)	0.826*** (0.109)	0.379*** (0.062)
Model	m5.2_bv_df_si	m5.2_bv_df3l_si	m5.2_bv_dft_si
Observations	2970	2764	2786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDPpc II	First-comer IPR			
	df	*df3l*	*df5l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables				
ipr_special_requirements_related_border_measures	-0.026 (0.104)	0.031 (0.215)	0.082 (0.384)	-0.061 (0.134)
ipr_civil_administrative_procedures_remedies	-0.175 (0.142)	-0.1 (0.302)	-0.246 (0.523)	-0.141 (0.18)
ipr_provisional_measure	0.106 (0.091)	-0.117 (0.197)	-0.056 (0.358)	0.106 (0.112)
ipr_criminal_procedures_remedies	0.093 (0.071)	0.087 (0.153)	0.024 (0.258)	0.089 (0.095)
ipr_service_provider_liability	-0.074 (0.07)	-0.449** (0.165)	-0.858** (0.28)	-0.169. (0.091)
ipr_committee	-0.019 (0.037)	-0.174* (0.082)	-0.239. (0.137)	-0.022 (0.044)
ipr_transparency	0.039 (0.059)	0.144 (0.134)	0.247 (0.227)	0.081 (0.075)
ipr_t_copyrights_related_rights	-0.095 (0.069)	-0.036 (0.151)	0.054 (0.258)	-0.1 (0.095)
ipr_t_trademarks	0.071 (0.076)	-0.039 (0.165)	-0.242 (0.284)	0.057 (0.093)
ipr_t_geo_indications	0.046 (0.041)	0.097 (0.098)	0.151 (0.163)	0.023 (0.051)
ipr_t_industrial_designs	-0.104 (0.085)	-0.075 (0.175)	-0.174 (0.38)	-0.085 (0.104)
ipr_t_patents	0.092 (0.097)	0.1 (0.201)	0.192 (0.368)	0.166 (0.118)
ipr_t_undisclosed_information	-0.039 (0.045)	-0.063 (0.098)	0.095 (0.199)	-0.079 (0.055)
ipr_t_layout_design_integ_circuits	-0.154* (0.063)	-0.032 (0.206)	-0.118 (0.358)	-0.101 (0.123)
ipr_t_new_plant_varieties	0.073 (0.067)	-0.047 (0.148)	0.037 (0.308)	0.041 (0.084)
ipr_t_trad_knowledge_genetic_resources	-0.001 (0.045)	-0.113 (0.097)	-0.307. (0.165)	0.084 (0.08)
ipr_t_encrypted_program_carrying_satellite_signals	0.071 (0.093)	0.156 (0.197)	0.266 (0.361)	0.359** (0.111)
ipr_t_domain_names	0.053 (0.119)	0.37 (0.25)	0.493 (0.455)	-0.071 (0.144)
Control Variables				
Democratisation (Polity 2) (mean)	0.001 (0.001)	0 (0.002)	-0.002 (0.003)	0.003** (0.001)
Classic IP leaders	-0.004 (0.013)	-0.011 (0.026)	-0.012 (0.045)	0.003 (0.015)
Countries with a high increase of patent protection	0.017 (0.012)	0.026 (0.025)	0.04 (0.042)	0.015 (0.014)
New IP producers and developers	-0.009 (0.015)	0.06. (0.032)	0.045 (0.054)	-0.016 (0.018)
ln Geographic distance (mean)	-0.016* (0.007)	-0.073*** (0.014)	-0.114*** (0.024)	-0.038*** (0.008)

Intercept	0.225*** (0.051)	0.935*** (0.107)	1.504*** (0.182)	0.411*** (0.06)
Model	m5.2_bv_fc_df_si	m5.2_bv_fc_df3l_si	m5.2_bv_fc_df5l_si	m5.2_bv_fc_dft_si
Observations	2970	2764	2653	2786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDP Growth Rate	First-comer IPR	
	df	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables		
ipr_special_requirements_related_border_measures	-2.803 (4.438)	-3.044 (6.07)
ipr_civil_administrative_procedures_remedies	-4.92 (6.035)	-6.06 (8.16)
ipr_provisional_measure	1.998 (3.872)	1.377 (5.069)
ipr_criminal_procedures_remedies	6.016* (3.046)	7.433. (4.313)
ipr_service_provider_liability	-6.041* (2.982)	-7.062. (4.137)
ipr_committee	-0.422 (1.579)	-0.292 (2.006)
ipr_transparency	-0.359 (2.532)	-1.854 (3.4)
ipr_t_copyrights_related_rights	3.37 (2.926)	4.265 (4.313)
ipr_t_trademarks	2.156 (3.253)	2.219 (4.217)
ipr_t_geo_indications	0.474 (1.804)	0.516 (2.382)
ipr_t_industrial_designs	0.343 (3.599)	0.184 (4.709)
ipr_t_patents	-2.185 (4.119)	-1.666 (5.356)
ipr_t_undisclosed_information	-1.274 (1.954)	-1.864 (2.542)
ipr_t_layout_design_integ_circuits	-2.496 (2.673)	-0.939 (5.591)
ipr_t_new_plant_varieties	-0.839 (2.846)	-2.138 (3.825)
ipr_t_trad_knowledge_genetic_resources	0.332 (1.935)	0.853 (3.644)
ipr_t_encrypted_program_carrying_satellite_signals	-1.221 (3.947)	-1.998 (5.062)
ipr_t_domain_names	5.033 (5.08)	6.283 (6.552)
Control Variables		
Democratisation (Polity 2) (mean)	-0.044 (0.041)	-0.043 (0.052)
Classic IP leaders	0.938. (0.541)	1.524* (0.699)
Countries with a high increase of patent protection	-0.621 (0.531)	-0.526 (0.668)
New IP producers and developers	1.089 (0.664)	0.853 (0.838)
ln Geographic distance (mean)	-0.021 (0.288)	0.058 (0.363)

Intercept	0.083 (2.228)	-0.526 (2.807)
Model	m5.3_bv_fc_df_si	m5.3_bv_fc_dft_si
Observations	2864	2684

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDPpc Growth Rate	Overall IPR *df*	FC IPR *df5*
Variables	Estimates (Std. Error)	Estimates (Std. Error)
IPR Specific Binary Variables		
ipr_special_requirements_related_border_measures	1.255 (4.425)	-0.149 (6.453)
ipr_civil_administrative_procedures_remedies	1.445 (6.866)	-0.5 (9.106)
ipr_provisional_measure	4.224 (5.192)	3.381 (5.957)
ipr_criminal_procedures_remedies	-5.542 (3.907)	-2.9 (4.618)
ipr_service_provider_liability	2.77 (2.955)	-0.383 (5.014)
ipr_committee	0.558 (2.071)	8.047** (2.457)
ipr_transparency	2.897 (3.041)	0.059 (4.059)
ipr_t_copyrights_related_rights	0.279 (3.037)	2.644 (4.558)
ipr_t_trademarks	1.974 (3.12)	-2.814 (4.985)
ipr_t_geo_indications	-0.799 (2.34)	0.928 (2.99)
ipr_t_industrial_designs	-9.483* (4.181)	-1.089 (5.297)
ipr_t_patents	3.477 (3.734)	-1.17 (6.041)
ipr_t_undisclosed_information	1.512 (2.617)	-0.46 (3.017)
ipr_t_layout_design_integ_circuits	3.512 (4.201)	-0.979 (6.234)
ipr_t_new_plant_varieties	3.079 (3.278)	2.8 (4.478)
ipr_t_trad_knowledge_genetic_resources	-4.92. (2.971)	-4.671 (2.978)
ipr_t_encrypted_program_carrying_satellite_signals	-2.469 (4.665)	1.285 (5.951)
ipr_t_domain_names	-9.152 (7.095)	-0.057 (7.534)
Control Variables		
Democratisation (Polity 2) (mean)	0.005 (0.061)	0.003 (0.061)
Classic IP leaders	0.047 (0.829)	0.421 (0.808)
Countries with a high increase of patent protection	-0.468 (0.792)	-0.282 (0.783)
New IP producers and developers	0.653 (0.994)	0.303 (0.986)
ln Geographic distance (mean)	-0.857. (0.442)	-0.853* (0.427)

Intercept	6.014. (3.402)	5.915. (3.299)
Model	m5.4_bv_df3l_si	m5.4_bv_fc_df3l_si
Observations	2661	2661

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 64: Economic Effect Regression Tables of the Additive Variables for the TRIPS-plus Categories

Investment in R&D I	Overall IPR		
	df	*df5l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables			
ipr_tripsplus_copyrights_related_rights	-0.152* (0.059)	-0.006 (0.13)	-0.034 (0.041)
ipr_tripsplus_trademarks	0.076* (0.038)	0.138*** (0.042)	0.013 (0.019)
ipr_tripsplus_geo_indications	0.045*** (0.012)	-0.004 (0.019)	0.017. (0.009)
ipr_tripsplus_industrial_design	-0.219** (0.076)	0.087 (0.114)	0.065 (0.049)
ipr_tripsplus_patents	0.014 (0.051)	-0.012 (0.063)	0.019 (0.028)
ipr_tripsplus_undisclosed_information	0.078 (0.073)	-0.056 (0.09)	0.009 (0.041)
ipr_tripsplus_layout_design	0.039 (0.361)	-0.253 (0.389)	-0.209 (0.181)
ipr_tripsplus_new_plant_varieties	-0.013 (0.071)	-0.217* (0.091)	-0.106** (0.036)
ipr_tripsplus_trad_knowledge_genetic_resources	-0.021 (0.018)	-0.067 (0.092)	-0.011 (0.009)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	-0.206 (0.179)	-0.035 (0.229)	0.054 (0.101)
ipr_tripsplus_domain_names	-0.2 (0.295)	-0.293 (0.388)	-0.037 (0.166)
ipr_tripsplus_enforcement	0.011* (0.005)	0.006 (0.011)	0 (0.006)
ipr_tripsplus_exhaustion	-0.029 (0.019)	-0.065 (0.129)	-0.079 (0.086)
Control Variables			
Democratisation (Polity 2) (mean)	-0.005. (0.003)	0.008* (0.003)	0.002 (0.002)
Classic IP leaders	0.128** (0.042)	0.205*** (0.044)	0.067** (0.021)
Countries with a high increase of patent protection	0.008 (0.038)	0.019 (0.035)	-0.023 (0.018)
New IP producers and developers	0.064 (0.04)	0.17*** (0.043)	0.035. (0.019)
ln GDP	-0.009 (0.009)	0.007 (0.009)	-0.001 (0.005)
ln GDPpc	-0.038* (0.017)	-0.084*** (0.018)	-0.022** (0.009)
ln Geographic distance (mean)	0.008 (0.018)	0.038. (0.02)	0.031*** (0.009)
Intercept	0.51* (0.221)	0.295 (0.243)	-0.015 (0.111)

Model	m1_bv_df_ti	m1_bv_df5l_ti	m1_bv_dft_ti
Observations	923	684	817

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Investment in R&D II	First-comer IPR		
	df	*df5l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables			
ipr_tripsplus_copyrights_related_rights	-0.052 (0.057)	-0.174 (0.174)	0.009 (0.029)
ipr_tripsplus_trademarks	-0.057 (0.043)	0.163*** (0.039)	0.001 (0.023)
ipr_tripsplus_geo_indications	0.151*** (0.022)	-0.02 (0.024)	0.022. (0.012)
ipr_tripsplus_industrial_design	-0.145 (0.108)	0.076 (0.136)	0.009 (0.056)
ipr_tripsplus_patents	0.138* (0.054)	0.004 (0.085)	0.014 (0.031)
ipr_tripsplus_undisclosed_information	-0.291* (0.121)	-0.105 (0.18)	-0.082 (0.066)
ipr_tripsplus_layout_design	NA	NA	NA
ipr_tripsplus_new_plant_varieties	-0.193* (0.087)	-0.027 (0.097)	-0.11* (0.052)
ipr_tripsplus_trad_knowledge_genetic_resources	-0.02 (0.016)	-0.187. (0.097)	-0.016* (0.008)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	0.017 (0.332)	0.239 (0.461)	-0.016 (0.178)
ipr_tripsplus_domain_names	-0.044 (0.308)	-0.236 (0.378)	0.144 (0.166)
ipr_tripsplus_enforcement	0.012* (0.005)	0.014 (0.012)	0.004 (0.008)
ipr_tripsplus_exhaustion	-0.028. (0.017)	-0.147 (0.139)	-0.063 (0.086)
Control Variables			
Democratisation (Polity 2) (mean)	-0.006. (0.003)	0.008* (0.003)	0.002 (0.002)
Classic IP leaders	0.125** (0.042)	0.179*** (0.044)	0.07*** (0.021)
Countries with a high increase of patent protection	0.003 (0.038)	0.022 (0.034)	-0.019 (0.018)
New IP producers and developers	0.06 (0.041)	0.163*** (0.042)	0.04* (0.02)
ln GDP	-0.007 (0.009)	0.006 (0.009)	-0.002 (0.005)
ln GDPpc	-0.031. (0.017)	-0.078*** (0.018)	-0.021* (0.009)
ln Geographic distance (mean)	0.001 (0.017)	0.03 (0.019)	0.025** (0.009)
Intercept	0.469* (0.214)	0.317 (0.228)	0.058 (0.107)
Model	m1_bv_fc_df_ti	m1_bv_fc_df5l_ti	m1_bv_fc_dft_ti
Observations	923	684	817

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Licensing	Overall IPR	
	df	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables		
ipr_tripsplus_copyrights_related_rights	-1.023. (0.527)	-0.463 (0.94)
ipr_tripsplus_trademarks	0.068 (0.391)	-0.187 (0.493)
ipr_tripsplus_geo_indications	-0.031 (0.116)	-0.063 (0.185)
ipr_tripsplus_industrial_design	1.042 (0.928)	1.942 (1.594)
ipr_tripsplus_patents	1.343* (0.651)	1.472 (0.912)
ipr_tripsplus_undisclosed_information	-0.152 (0.795)	0.138 (1.01)
ipr_tripsplus_layout_design	-5.325 (3.767)	-4.619 (4.432)
ipr_tripsplus_new_plant_varieties	0.778 (0.732)	0.643 (1.044)
ipr_tripsplus_trad_knowledge_genetic_resources	0.14 (0.254)	0.156 (0.32)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	0.748 (1.649)	1.026 (2.145)
ipr_tripsplus_domain_names	-3.127 (3.076)	-2.738 (4.297)
ipr_tripsplus_enforcement	-0.158* (0.071)	-0.25. (0.139)
ipr_tripsplus_exhaustion	-0.019 (0.216)	-0.482 (1.258)
Control Variables		
Democratisation (Polity 2) (mean)	-0.13** (0.047)	-0.101. (0.055)
Classic IP leaders	-0.341 (0.469)	-0.634 (0.552)
Countries with a high increase of patent protection	-0.165 (0.443)	-0.287 (0.516)
New IP producers and developers	-0.245 (0.455)	-0.223 (0.539)
ln GDP	-0.261* (0.117)	-0.318* (0.144)
ln GDPpc	0.141 (0.202)	0.199 (0.243)
ln Geographic distance (mean)	0.181 (0.227)	-0.037 (0.274)
Intercept	6.355* (2.833)	9.203** (3.466)
Model	m2.2_bv_df_ti	m2.2_bv_dft_ti
Observations	1542	1356

Innovation: Researchers in R&D I	Overall IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables					
ipr_tripsplus_copyrights_related_rights	-0.004 (0.03)	-0.002 (0.079)	-0.022 (0.17)	-3.755* (1.525)	0.023 (0.053)
ipr_tripsplus_trademarks	0.025 (0.019)	0.085* (0.035)	0.152** (0.054)	0.573** (0.21)	0.01 (0.023)
ipr_tripsplus_geo_indications	0.017** (0.006)	-0.011 (0.019)	-0.014 (0.025)	0.006 (0.058)	0.013 (0.011)
ipr_tripsplus_industrial_design	-0.017 (0.037)	-0.064 (0.105)	0.001 (0.149)	-0.157 (0.472)	0.011 (0.06)
ipr_tripsplus_patents	-0.03 (0.026)	0.084 (0.059)	0.131 (0.081)	-0.097 (0.348)	-0.032 (0.037)
ipr_tripsplus_undisclosed_information	0.05 (0.036)	-0.085 (0.084)	-0.145 (0.117)	1.739* (0.724)	0.049 (0.05)
ipr_tripsplus_layout_design	0.079 (0.177)	-0.342 (0.386)	-0.798 (0.506)	0.195 (1.978)	0.129 (0.223)
ipr_tripsplus_new_plant_varieties	-0.099** (0.035)	-0.081 (0.083)	-0.29* (0.119)	-0.363 (0.524)	-0.099* (0.044)
ipr_tripsplus_trad_knowledge_genetic_resources	-0.028** (0.009)	0.097 (0.077)	-0.096 (0.12)	NA	-0.026* (0.012)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	-0.132 (0.087)	0.108 (0.226)	0.032 (0.299)	-2.881* (1.253)	-0.08 (0.123)
ipr_tripsplus_domain_names	-0.014 (0.144)	-0.299 (0.338)	-0.622 (0.506)	3.847* (1.818)	0.041 (0.201)
ipr_tripsplus_enforcement	0.002 (0.003)	-0.021* (0.009)	0.002 (0.014)	0.181. (0.108)	-0.001 (0.007)
ipr_tripsplus_exhaustion	-0.022* (0.01)	-0.085 (0.126)	-0.202 (0.167)	NA	-0.026 (0.104)
Control Variables					
Democratisation (Polity 2) (mean)	0.002 (0.002)	0 (0.004)	0.016** (0.006)	-0.03* (0.015)	0.004 (0.003)
Classic IP leaders	0.06** (0.023)	0.146** (0.045)	0.15* (0.064)	0.122 (0.141)	0.071* (0.028)
Countries with a high increase of patent protection	-0.019 (0.021)	-0.002 (0.039)	-0.006 (0.051)	-0.045 (0.11)	-0.029 (0.025)
New IP producers and developers	0.043* (0.021)	0.064 (0.046)	0.276*** (0.064)	-0.133 (0.173)	0.054* (0.025)
ln GDP	-0.001 (0.005)	-0.005 (0.01)	-0.004 (0.013)	-0.015 (0.027)	-0.005 (0.006)
ln GDPpc	-0.023* (0.01)	-0.09*** (0.02)	-0.105*** (0.028)	-0.086 (0.065)	-0.026* (0.013)
ln Geographic distance (mean)	0.042*** (0.01)	0.076*** (0.021)	0.096** (0.03)	0.126* (0.059)	0.036** (0.012)
Intercept	-0.025 (0.122)	0.591* (0.254)	0.49 (0.354)	1.12 (0.745)	0.139 (0.153)
Model	m3.1_bv_df_ti	m3.1_bv_df3l_ti	m3.1_bv_df5l_ti	m3.1_bv_df10l_ti	m3.1_bv_dft_ti
Observations	786	640	582	357	683

Innovation: Researchers in R&D II	First-comer IPR			
	df	*df3l*	*df5l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables				
ipr_tripsplus_copyrights_related_rights	0.021 (0.03)	-0.042 (0.061)	-0.067 (0.226)	0.021 (0.03)
ipr_tripsplus_trademarks	0.028 (0.022)	0.082* (0.034)	0.136** (0.052)	0.028 (0.022)
ipr_tripsplus_geo_indications	0.004 (0.012)	0.003 (0.024)	-0.008 (0.032)	0.004 (0.012)
ipr_tripsplus_industrial_design	-0.05 (0.06)	-0.161 (0.131)	-0.304 (0.186)	-0.05 (0.06)
ipr_tripsplus_patents	-0.081** (0.027)	0.049 (0.069)	0.366** (0.111)	-0.081** (0.027)
ipr_tripsplus_undisclosed_information	0.04 (0.062)	-0.191 (0.131)	-0.255 (0.233)	0.04 (0.062)
ipr_tripsplus_layout_design	NA	NA	NA	NA
ipr_tripsplus_new_plant_varieties	-0.012 (0.046)	-0.054 (0.093)	-0.086 (0.126)	-0.012 (0.046)
ipr_tripsplus_trad_knowledge_ge-netic_resources	-0.028*** (0.008)	0.052 (0.087)	-0.197 (0.127)	-0.028*** (0.008)
ipr_tripsplus_encrypted_program_carry-ing_satellite_signals	-0.209 (0.176)	0.696 (0.441)	-0.384 (0.599)	-0.209 (0.176)
ipr_tripsplus_domain_names	0.109 (0.152)	-0.438 (0.354)	-0.536 (0.492)	0.109 (0.152)
ipr_tripsplus_enforcement	-0.006* (0.003)	-0.022* (0.011)	0.001 (0.016)	-0.006* (0.003)
ipr_tripsplus_exhaustion	-0.017* (0.008)	-0.043 (0.127)	-0.375* (0.181)	-0.017* (0.008)
Control Variables				
Democratisation (Polity 2) (mean)	0.002 (0.002)	-0.001 (0.004)	0.016** (0.006)	0.002 (0.002)
Classic IP leaders	0.077*** (0.023)	0.153*** (0.046)	0.111. (0.064)	0.077*** (0.023)
Countries with a high increase of patent protection	-0.013 (0.021)	0.005 (0.039)	0.002 (0.05)	-0.013 (0.021)
New IP producers and developers	0.054* (0.022)	0.084. (0.045)	0.28*** (0.062)	0.054* (0.022)
ln GDP	-0.006 (0.005)	-0.007 (0.01)	-0.005 (0.013)	-0.006 (0.005)
ln GDPpc	-0.027* (0.01)	-0.094*** (0.02)	-0.094*** (0.028)	-0.027* (0.01)
ln Geographic distance (mean)	0.034*** (0.01)	0.062** (0.019)	0.076** (0.028)	0.034*** (0.01)
Intercept	0.193 (0.12)	0.775** (0.242)	0.545 (0.334)	0.193 (0.12)
Model	m3.1_bv_fc_df_ti	m3.1_bv_fc_df3l_ti	m3.1_bv_fc_df5l_ti	m3.1_bv_fc_df_ti
Observations	786	640	582	786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Innovation: Resident Applications for Industrial Designs	Overall IPR *dft*	FC IPR *dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables		
ipr_tripsplus_copyrights_related_rights	0.097 (1.925)	1.126 (2.059)
ipr_tripsplus_trademarks	-0.432 (1.035)	-0.754 (1.221)
ipr_tripsplus_geo_indications	-0.767. (0.396)	-0.72 (0.711)
ipr_tripsplus_industrial_design	0.301 (3.127)	1.564 (3.834)
ipr_tripsplus_patents	-0.108 (1.745)	-1.866 (1.807)
ipr_tripsplus_undisclosed_information	-1.284 (2.075)	-1.681 (3.284)
ipr_tripsplus_layout_design	-0.42 (9.107)	NA
ipr_tripsplus_new_plant_varieties	-1.497 (1.977)	-1.708 (2.866)
ipr_tripsplus_trad_knowledge_genetic_resources	0.29 (0.643)	-0.505 (0.622)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	2.25 (4.444)	2.838 (7.417)
ipr_tripsplus_domain_names	-0.315 (8.408)	6.717 (9.498)
ipr_tripsplus_enforcement	0.043 (0.284)	0.081 (0.493)
ipr_tripsplus_exhaustion	6.975** (2.409)	6.495* (2.736)
Control Variables		
Democratisation (Polity 2) (mean)	-0.053 (0.089)	-0.055 (0.089)
Classic IP leaders	2.657* (1.096)	2.469* (1.087)
Countries with a high increase of patent protection	-0.236 (0.891)	-0.211 (0.889)
New IP producers and developers	0.37 (1.063)	0.602 (1.077)
ln GDP	-0.418 (0.267)	-0.439. (0.266)
ln GDPpc	0.937* (0.449)	0.85. (0.448)
ln Geographic distance (mean)	-0.947. (0.53)	-1.175* (0.515)
Intercept	11.558. (6.427)	14.381* (6.213)
Model	m3.3_bv_dft_ti	m3.3_bv_fc_dft_ti
Observations	1814	1814

Technology Transfer: PTA Member Applications for Industrial Designs I	Overall IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables					
ipr_tripsplus_copyrights_related_rights	0.491 (0.408)	-0.467 (1.486)	0.486 (1.743)	-0.655 (3.552)	-11.148 (14.059)
ipr_tripsplus_trademarks	-0.676* (0.316)	-0.726 (0.77)	0.125 (0.894)	3.294. (1.761)	5.737 (6.866)
ipr_tripsplus_geo_indications	0.296*** (0.086)	-0.046 (0.328)	-0.841. (0.468)	-0.472 (0.736)	-1.099 (1.864)
ipr_tripsplus_industrial_design	1.456* (0.681)	-1.769 (2.501)	0.619 (3.313)	-2.127 (4.486)	-15.494 (21.869)
ipr_tripsplus_patents	-3.034*** (0.526)	-0.799 (1.206)	-1.967 (1.526)	-5.418* (2.711)	-36.691* (16.564)
ipr_tripsplus_undisclosed_information	4.755*** (0.687)	3.427* (1.558)	6.515** (2.384)	20.785*** (4.112)	23.519 (15.797)
ipr_tripsplus_layout_design	37.127*** (3.089)	76.403*** (6.724)	73*** (6.925)	62.324*** (9.394)	116.929. (63.607)
ipr_tripsplus_new_plant_varieties	-0.277 (0.56)	1.013 (1.627)	-0.743 (2.045)	-1.779 (3.653)	-1.161 (14.781)
ipr_tripsplus_trad_knowledge_genetic_resources	-0.808*** (0.208)	-0.237 (0.485)	-5.858 (3.818)	NA	-11.034* (4.971)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	-0.194 (1.457)	-0.02 (4.765)	-11.287 (8.101)	-26.04 (17.016)	-6.032 (27.11)
ipr_tripsplus_domain_names	7.172** (2.24)	-0.066 (5.729)	NA	NA	9.926 (46.317)
ipr_tripsplus_enforcement	0.054 (0.055)	0.057 (0.127)	0.619 (0.408)	0.397 (0.529)	7.165* (2.788)
ipr_tripsplus_exhaustion	-0.312. (0.161)	0.207 (0.472)	-7.111. (4.001)	-19.689*** (5.157)	-19.505 (29.463)
Control Variables					
Democratisation (Polity 2) (mean)	0.141** (0.05)	0.153 (0.112)	0.126 (0.111)	-0.089 (0.148)	-5.749*** (1.158)
Classic IP leaders	-1.137* (0.54)	-1.688 (1.114)	-1.78 (1.179)	-6.422*** (1.574)	0.734 (13.157)
Countries with a high increase of patent protection	-1.247* (0.547)	-2.359* (1.04)	-2.45* (1.075)	-2.915* (1.252)	17.967 (11.647)
New IP producers and developers	0.142 (0.493)	0.829 (1.102)	1.082 (1.148)	0.608 (1.549)	-23.43* (9.295)
ln GDP	0.229* (0.113)	0.388. (0.225)	0.373 (0.242)	0.632* (0.312)	7.047*** (2.112)
ln GDPpc	-0.48* (0.216)	-0.362 (0.438)	-0.658 (0.465)	0.532 (0.61)	-11.471* (4.749)
ln Geographic distance (mean)	0.97*** (0.274)	1.588** (0.548)	1.378* (0.62)	3.588*** (0.829)	0.78 (6.237)
Intercept	-8.415** (3.154)	-17.232** (6.416)	-12.213. (7.074)	-41.694*** (10.084)	-20.907 (74.571)
Model	m4.3_bv_df_ti	m4.3_bv_df3l_ti	m4.3_bv_df5l_ti	m4.3_bv_df10l_ti	m4.3_bv_dft_ti
Observations	755	568	506	361	430

Technology Transfer: PTA Member Applications for Industrial Designs II	First-comer IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables					
ipr_tripsplus_copyrights_related_rights	-0.056 (0.585)	-1.304 (1.438)	-0.983 (1.585)	1.137 (4.705)	-3.417 (11.087)
ipr_tripsplus_trademarks	0.517 (0.525)	0.645 (0.997)	0.844 (1.239)	1.486 (2.081)	0.75 (9.583)
ipr_tripsplus_geo_indications	-0.234 (0.234)	-0.272 (0.542)	-0.355 (0.753)	-0.573 (0.985)	-2.313 (5.503)
ipr_tripsplus_industrial_design	-0.404 (1.417)	-2.2 (2.749)	-3.484 (3.741)	-0.094 (5.225)	-13.948 (28.247)
ipr_tripsplus_patents	-0.968. (0.568)	-0.945 (1.521)	0.509 (1.964)	-0.076 (3.639)	5.802 (12.904)
ipr_tripsplus_undisclosed_information	1.555 (1.178)	2.432 (3.176)	1.662 (3.75)	0.328 (5.225)	20.044 (29.569)
ipr_tripsplus_layout_design	-5.443 (5.074)	-22.361. (12.908)	-20.743 (13.774)	-16.779 (16.725)	NA
ipr_tripsplus_new_plant_varieties	-0.93 (0.968)	0.216 (1.928)	0.957 (2.604)	1.033 (3.329)	7.612 (17.992)
ipr_tripsplus_trad_knowledge_genetic_resources	-0.339. (0.2)	-0.058 (0.411)	1.193 (4.863)	NA	-0.297 (3.259)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	6.208. (3.545)	21.619* (10.403)	19.416. (11.006)	15.572 (20.121)	-27.985 (58.623)
ipr_tripsplus_domain_names	4.74 (3.802)	-2.219 (8.963)	-6.514 (9.807)	-13.051 (12.217)	-10.42 (74.005)
ipr_tripsplus_enforcement	-0.093 (0.06)	-0.226. (0.118)	-0.396 (0.561)	-0.532 (0.814)	-2.845 (3.849)
ipr_tripsplus_exhaustion	0.019 (0.205)	0.514 (0.386)	-4.535 (4.508)	-7.629 (5.085)	-22.886 (29.002)
Control Variables					
Democratisation (Polity 2) (mean)	0.023 (0.058)	0.044 (0.135)	0.03 (0.134)	-0.21 (0.189)	-5.763*** (1.146)
Classic IP leaders	0.856 (0.601)	0.414 (1.294)	-0.153 (1.397)	-6.001** (2)	0.255 (12.272)
Countries with a high increase of patent protection	-0.854 (0.614)	-1.183 (1.22)	-2.163. (1.272)	-2.788. (1.555)	13.478 (11.439)
New IP producers and developers	-0.235 (0.616)	0.149 (1.322)	-0.119 (1.358)	-2.053 (1.907)	-26.109** (9.934)
ln GDP	0.303* (0.125)	0.697** (0.264)	0.735* (0.287)	1.087** (0.383)	7.751*** (2.086)
ln GDPpc	-0.827*** (0.249)	-0.817 (0.526)	-1.005. (0.555)	0.058 (0.763)	-11.226* (4.956)
ln Geographic distance (mean)	1.384*** (0.296)	2.415*** (0.605)	2.913*** (0.721)	5.588*** (0.978)	10.299* (5.058)
Intercept	-10.202** (3.381)	-27.805*** (7.266)	-30.029*** (8.295)	-62.579*** (12.242)	-111.63. (67.602)
Model	m4.3_bv_fc_df_ti	m4.3_bv_fc_df3l_ti	m4.3_bv_fc_df5l_ti	m4.3_bv_fc_df10l_ti	m4.3_bv_fc_dft_ti
Observations	755	568	506	361	430

Technology Transfer: PTA Member Applications for Patents	Overall IPR				
	df	*df3l*	*df5l*	*df10l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables					
ipr_tripsplus_copyrights_related_rights	-61.729*** (13.904)	-46.587*** (9.1)	-54.777*** (15.546)	22.511*** (5.896)	-11.889 (42.784)
ipr_tripsplus_trademarks	19.218. (11.252)	23.048*** (5.465)	41.132*** (9.815)	23.454*** (3.354)	-10.867 (24.502)
ipr_tripsplus_geo_indications	-6.704* (2.978)	-3.182 (2.309)	-10.946* (4.659)	0.406 (1.522)	-2.51 (6.365)
ipr_tripsplus_industrial_design	-28.476 (23.063)	-68.862*** (15.089)	-76.489** (29.093)	-21.742** (7.235)	-6.063 (68.533)
ipr_tripsplus_patents	81.083*** (18.163)	48.555*** (8.231)	75.328*** (15.235)	46.37*** (6.044)	25.335 (47.775)
ipr_tripsplus_undisclosed_information	87.915*** (23.467)	51.677*** (10.408)	65.44** (20.493)	69.74*** (8.883)	-23.666 (46.154)
ipr_tripsplus_layout_design	-467.618** (163.816)	-234.36*** (63.946)	-369.408*** (107.206)	-238.01*** (31.479)	-145.83 (241.739)
ipr_tripsplus_new_plant_varieties	19.825 (18.262)	23.969* (10.023)	17.962 (18.056)	-26.808*** (6.658)	14.451 (47.336)
ipr_tripsplus_trad_knowledge_genetic_resources	6.356 (7.059)	-0.889 (3.423)	-42.37 (33.828)	NA	12.325 (14.828)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	2.203 (43.88)	-58.902* (26.222)	-116.27. (60.887)	-15.666 (19.645)	2.756 (93.657)
ipr_tripsplus_domain_names	-9.179 (78.493)	-150.547*** (40.064)	-270.145** (87.522)	-319.467*** (35.151)	19.649 (169.874)
ipr_tripsplus_enforcement	-5.568** (1.91)	0.08 (0.911)	3.429 (3.737)	-3.426** (1.26)	-5 (7.056)
ipr_tripsplus_exhaustion	-1.567 (5.542)	-3.468 (3.386)	-74.939** (22.876)	-63.68*** (5.809)	0.165 (66.441)
Control Variables					
Democratisation (Polity 2) (mean)	-0.249 (1.821)	-0.294 (0.759)	-0.042 (1.15)	0.041 (0.301)	3.176 (4.091)
Classic IP leaders	3.063 (18.963)	0.956 (7.391)	-8.015 (11.743)	1.184 (3.072)	35.856 (40.546)
Countries with a high increase of patent protection	-7.087 (17.247)	-5.752 (6.838)	-10.922 (10.341)	-2.358 (2.627)	-19.355 (32.558)
New IP producers and developers	-30.983. (15.888)	-12.494. (6.629)	-20.711. (10.648)	-5.872. (3.097)	53.673. (29.596)
ln GDP	7.656* (3.544)	3.375* (1.448)	4.357. (2.336)	0.689 (0.595)	22.46*** (6.244)
ln GDPpc	6.626 (6.827)	2.737 (2.766)	4.969 (4.359)	0.431 (1.163)	1.896 (13.675)
ln Geographic distance (mean)	21.541* (8.624)	9.316* (3.63)	12.573* (5.641)	7.475*** (1.558)	38.582* (16.898)
Intercept	-417.726*** (105.602)	-178.472*** (45.238)	-241.973*** (69.44)	-75.683*** (19.735)	-943.019*** (218.329)

Model	m4.4_bv_d f_ti	m4.4_bv_d f3l_ti	m4.4_bv_d f5l_ti	m4.4_bv_d f10l_ti	m4.4_bv_d ft_si
Observations	980	796	721	521	622

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: Total *htp* Imports	Overall IPR		
	df	*df3l*	*df10l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables			
ipr_tripsplus_copyrights_related_rights	0.097 (0.609)	0 (0)	0 (0)
ipr_tripsplus_trademarks	0.785** (0.287)	0 (0)	0* (0)
ipr_tripsplus_geo_indications	-0.048 (0.164)	0 (0)	0 (0)
ipr_tripsplus_industrial_design	-0.186 (0.989)	0 (0)	0 (0)
ipr_tripsplus_patents	0.155 (0.421)	0 (0)	0 (0)
ipr_tripsplus_undisclosed_information	0.044 (0.586)	0 (0)	0 (0)
ipr_tripsplus_layout_design	-0.235 (2.896)	0 (0)	0 (0)
ipr_tripsplus_new_plant_varieties	-0.566 (0.681)	0 (0)	0 (0)
ipr_tripsplus_trad_knowledge_genetic_resources	-0.103 (0.244)	0 (0)	0 (0)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	-1.496 (1.155)	0 (0)	0 (0)
ipr_tripsplus_domain_names	-2.516 (2.041)	0 (0)	0 (0)
ipr_tripsplus_enforcement	0.001 (0.079)	0. (0)	0 (0)
ipr_tripsplus_exhaustion	-0.128 (0.601)	0 (0)	0* (0)
Control Variables			
Democratisation (Polity 2) (mean)	0.055. (0.03)	0 (0)	0 (0)
Classic IP leaders	-0.07 (0.527)	0*** (0)	0*** (0)
Countries with a high increase of patent protection	-0.171 (0.331)	0 (0)	0 (0)
New IP producers and developers	0.791* (0.332)	0 (0)	0 (0)
ln GDP	0.242* (0.103)	0*** (0)	0*** (0)
ln GDPpc	-0.509** (0.171)	0*** (0)	0*** (0)
ln Geographic distance (mean)	0.002 (0.186)	0*** (0)	0** (0)
Intercept	-1.792 (2.112)	-1*** (0)	-1*** (0)
Model	m4.5_bv_df_ti	m4.5_bv_df3l_ti	m4.5_bv_df10l_ti
Observations	623	305	203

Technology Transfer: Total *htp* Imports II	First-comer IPR		
	df	*df5l*	*df10l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables			
ipr_tripsplus_copyrights_related_rights	0.845 (0.727)	0 (0)	0 (0)
ipr_tripsplus_trademarks	1.392*** (0.35)	0 (0)	0** (0)
ipr_tripsplus_geo_indications	-0.069 (0.209)	0 (0)	0 (0)
ipr_tripsplus_industrial_design	0.242 (1.123)	0 (0)	0 (0)
ipr_tripsplus_patents	-0.126 (0.563)	0 (0)	0 (0)
ipr_tripsplus_undisclosed_information	-1.03 (1.022)	0. (0)	0 (0)
ipr_tripsplus_layout_design	-1.314 (5.118)	0 (0)	0 (0)
ipr_tripsplus_new_plant_varieties	-0.002 (1.001)	0 (0)	0 (0)
ipr_tripsplus_trad_knowledge_genetic_resources	-0.113 (0.342)	0 (0)	0 (0)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	0.62 (1.906)	0 (0)	0 (0)
ipr_tripsplus_domain_names	-3.052 (2.778)	0 (0)	0 (0)
ipr_tripsplus_enforcement	-0.086 (0.113)	0 (0)	0 (0)
ipr_tripsplus_exhaustion	-0.059 (0.627)	0 (0)	0. (0)
Control Variables			
Democratisation (Polity 2) (mean)	0.054. (0.03)	0 (0)	0 (0)
Classic IP leaders	-0.214 (0.477)	0*** (0)	0*** (0)
Countries with a high increase of patent protection	-0.162 (0.325)	0 (0)	0 (0)
New IP producers and developers	0.743* (0.326)	0 (0)	0 (0)
ln GDP	0.232* (0.103)	0*** (0)	0*** (0)
ln GDPpc	-0.495** (0.169)	0** (0)	0*** (0)
ln Geographic distance (mean)	-0.001 (0.182)	0** (0)	0** (0)
Intercept	-1.674 (2.037)	-1*** (0)	-1*** (0)
Model	m4.5_bv_fc_df_ti	m4.5_bv_fc_df5l_ti	m4.5_bv_fc_df10l_ti
Observations	623	311	203

Technology Transfer: Total *mltp* Imports	FC IPR *df*
Variables	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables	
ipr_tripsplus_copyrights_related_rights	0.014 (0.105)
ipr_tripsplus_trademarks	0.121* (0.05)
ipr_tripsplus_geo_indications	-0.04 (0.03)
ipr_tripsplus_industrial_design	0.023 (0.162)
ipr_tripsplus_patents	-0.015 (0.081)
ipr_tripsplus_undisclosed_information	0.056 (0.147)
ipr_tripsplus_layout_design	-0.575 (0.736)
ipr_tripsplus_new_plant_varieties	0.011 (0.144)
ipr_tripsplus_trad_knowledge_genetic_resources	0.009 (0.049)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	-0.02 (0.274)
ipr_tripsplus_domain_names	-0.22 (0.4)
ipr_tripsplus_enforcement	-0.017 (0.016)
ipr_tripsplus_exhaustion	0.007 (0.09)
Control Variables	
Democratisation (Polity 2) (mean)	0.01* (0.004)
Classic IP leaders	-0.013 (0.069)
Countries with a high increase of patent protection	0.011 (0.047)
New IP producers and developers	0.051 (0.047)
ln GDP	0.01 (0.015)
ln GDPpc	-0.078** (0.024)
ln Geographic distance (mean)	0.034 (0.026)
Intercept	0.272 (0.293)
Model	m4.7_bv_fc_df_ti
Observations	623

Technology Transfer: Total *ltp* Imports	Overall IPR *df*
Variables	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables	
ipr_tripsplus_copyrights_related_rights	-8039.3 (6608.8)
ipr_tripsplus_trademarks	753.9 (2620.8)
ipr_tripsplus_geo_indications	642.8 (2115.2)
ipr_tripsplus_industrial_design	-8037.7 (9218.8)
ipr_tripsplus_patents	-3085.6 (3304.3)
ipr_tripsplus_undisclosed_information	-1155.1 (4893.7)
ipr_tripsplus_layout_design	5802.9 (22081.8)
ipr_tripsplus_new_plant_varieties	-102.1 (6275.8)
ipr_tripsplus_trad_knowledge_genetic_resources	-7137.6 (6592.3)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	-13032.9 (12956.2)
ipr_tripsplus_domain_names	10002.5 (17194.6)
ipr_tripsplus_enforcement	1674.7. (917.2)
ipr_tripsplus_exhaustion	-1146.4 (4109.8)
Control Variables	
Democratisation (Polity 2) (mean)	108.7 (224.3)
Classic IP leaders	3821.3 (4068)
Countries with a high increase of patent protection	-1147.3 (2260.9)
New IP producers and developers	575 (2401.4)
ln GDP	1342. (739.6)
ln GDPpc	788.7 (1205.6)
ln Geographic distance (mean)	-3447.3* (1337.4)
Intercept	-11636.6 (15285.2)
Model	m4.8_bv_df_ti
Observations	462

Technology Transfer: PTA Member *htp* Imports I	Overall IPR *df3l*	*df5l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables			
ipr_tripsplus_copyrights_related_rights	-60237129 (40579114)	-49893623 (33829915)	-38745368* (19536748)
ipr_tripsplus_trademarks	5556942 (15065110)	8195977 (12949822)	-826709 (8870796)
ipr_tripsplus_geo_indications	14819177 (12268301)	25881794* (11019240)	6565249 (5643931)
ipr_tripsplus_industrial_design	-100676627. (55994402)	-110316441* (47985048)	-58832402. (34647656)
ipr_tripsplus_patents	-1052482 (19282259)	-5605332 (16063608)	-2519667 (13327468)
ipr_tripsplus_undisclosed_information	6217906 (28642145)	-13156024 (25433020)	7285791 (18558052)
ipr_tripsplus_layout_design	-38829420 (118383201)	2458063 (102225377)	-19711810 (78996504)
ipr_tripsplus_new_plant_varieties	88912230** (33719919)	96898048*** (28502455)	58745174** (19892559)
ipr_tripsplus_trad_knowledge_genetic_resources	-2403839 (13904221)	5922199 (18608168)	3863680 (7587928)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	-41077623 (66927333)	-40265348 (63864997)	-24741208 (36796969)
ipr_tripsplus_domain_names	2991585 (94509460)	10114760 (88595446)	17736942 (63867617)
ipr_tripsplus_enforcement	2389892 (4487983)	3814539 (4060132)	1267518 (3026558)
ipr_tripsplus_exhaustion	-38385692 (57282881)	-29717616 (43655260)	-24776667 (40549721)
Control Variables			
Democratisation (Polity 2) (mean)	-1954908 (1460890)	-2879740* (1125511)	-1584995. (955485)
Classic IP leaders	-36299425 (25013629)	-16489134 (19880940)	-16428023 (16385180)
Countries with a high increase of patent protection	-3681580 (14628681)	1893117 (12064067)	-4227917 (10142034)
New IP producers and developers	-29033092* (14765348)	-19446882 (13131224)	-19260511. (10209932)
ln GDP	19285889*** (4709421)	10109844** (3780889)	10652542*** (3196113)
ln GDPpc	-18487116* (7767678)	-4732834 (6154985)	-5830661 (5239199)
ln Geographic distance (mean)	12529339 (8721923)	1335475 (6971426)	4694808 (5856349)
Intercept	-390836725*** (99265085)	-201176721* (79246047)	-230939151*** (66247371)
Model	m4.9_bv_df3l_ti	m4.9_bv_df5l_ti	m4.9_bv_dft_ti
Observations	516	466	576

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Technology Transfer: PTA Member *htp* Imports II	FC IPR *df5l*
Variables	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables	
ipr_tripsplus_copyrights_related_rights	25825910 (34199259)
ipr_tripsplus_trademarks	-3964724 (13531108)
ipr_tripsplus_geo_indications	1399012 (16224880)
ipr_tripsplus_industrial_design	-11671659 (51876493)
ipr_tripsplus_patents	17475172 (20181225)
ipr_tripsplus_undisclosed_information	1807693 (38003865)
ipr_tripsplus_layout_design	-53346385 (129911131)
ipr_tripsplus_new_plant_varieties	-35455518 (37015664)
ipr_tripsplus_trad_knowledge_ge-netic_resources	115907988*** (25608639)
ipr_tripsplus_encrypted_program_carry-ing_satellite_signals	52343703 (75144793)
ipr_tripsplus_domain_names	-67697148 (100088273)
ipr_tripsplus_enforcement	-5905356 (4681336)
ipr_tripsplus_exhaustion	-28197664 (44379020)
Control Variables	
Democratisation (Polity 2) (mean)	-3371959** (1143650)
Classic IP leaders	-4519544 (17716523)
Countries with a high increase of patent protection	2245471 (12133480)
New IP producers and developers	-33223795* (13003334)
ln GDP	12360482** (3834942)
ln GDPpc	-3402584 (6243862)
ln Geographic distance (mean)	4957362 (6933886)
Intercept	-286377977*** (78224563)
Model	m4.9_bv_fc_df5l_ti
Observations	466

Growth: GDP I	Overall IPR	
	df	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables		
ipr_tripsplus_copyrights_related_rights	-0.071** (0.022)	-0.064 (0.04)
ipr_tripsplus_trademarks	0.026 (0.016)	0.017 (0.021)
ipr_tripsplus_geo_indications	-0.02*** (0.005)	-0.025** (0.008)
ipr_tripsplus_industrial_design	0.031 (0.038)	0.095 (0.063)
ipr_tripsplus_patents	0.079** (0.026)	0.033 (0.035)
ipr_tripsplus_undisclosed_information	0.034 (0.033)	0.058 (0.042)
ipr_tripsplus_layout_design	-0.191 (0.15)	0.056 (0.178)
ipr_tripsplus_new_plant_varieties	0 (0.029)	-0.032 (0.04)
ipr_tripsplus_trad_knowledge_genetic_resources	0.017 (0.011)	0.008 (0.013)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	-0.076 (0.068)	0.069 (0.09)
ipr_tripsplus_domain_names	-0.141 (0.125)	-0.064 (0.17)
ipr_tripsplus_enforcement	-0.011*** (0.003)	-0.006 (0.006)
ipr_tripsplus_exhaustion	-0.001 (0.01)	0.004 (0.049)
Control Variables		
Democratisation (Polity 2) (mean)	0 (0.001)	0.002 (0.001)
Classic IP leaders	0.02 (0.014)	0.017 (0.016)
Countries with a high increase of patent protection	0.007 (0.013)	0.006 (0.015)
New IP producers and developers	-0.013 (0.016)	-0.02 (0.019)
ln Geographic distance (mean)	0 (0.007)	-0.021* (0.009)
Intercept	0.146** (0.056)	0.324*** (0.066)
Model	m5.1_bv_df_ti	m5.1_bv_dft_ti
Observations	2970	2786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDP II	First-comer IPR		
	df	*df3l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables			
ipr_tripsplus_copyrights_related_rights	-0.055* (0.026)	0.049 (0.065)	-0.045 (0.042)
ipr_tripsplus_trademarks	0.054** (0.021)	-0.005 (0.046)	0.049* (0.024)
ipr_tripsplus_geo_indications	-0.015 (0.011)	-0.004 (0.032)	-0.023 (0.015)
ipr_tripsplus_industrial_design	0.012 (0.059)	-0.003 (0.132)	0.076 (0.077)
ipr_tripsplus_patents	0.008 (0.027)	-0.114. (0.068)	-0.009 (0.036)
ipr_tripsplus_undisclosed_information	0.036 (0.051)	-0.048 (0.119)	-0.033 (0.067)
ipr_tripsplus_layout_design	0.005 (0.187)	0.552 (0.422)	0.121 (0.226)
ipr_tripsplus_new_plant_varieties	0.015 (0.044)	-0.054 (0.1)	-0.036 (0.059)
ipr_tripsplus_trad_knowledge_ge-netic_resources	-0.009 (0.01)	-0.08*** (0.024)	-0.013 (0.013)
ipr_tripsplus_encrypted_program_carry-ing_satellite_signals	-0.052 (0.113)	0.206 (0.252)	0.234 (0.147)
ipr_tripsplus_domain_names	0.094 (0.153)	0.798* (0.352)	0.047 (0.189)
ipr_tripsplus_enforcement	-0.009** (0.003)	-0.011 (0.008)	0.005 (0.01)
ipr_tripsplus_exhaustion	-0.021. (0.012)	-0.09*** (0.027)	0.001 (0.056)
Control Variables			
Democratisation (Polity 2) (mean)	-0.001 (0.001)	-0.008*** (0.002)	0.001 (0.001)
Classic IP leaders	-0.004 (0.014)	0.007 (0.031)	0.008 (0.016)
Countries with a high increase of patent protection	0.012 (0.013)	0.022 (0.029)	0.01 (0.015)
New IP producers and developers	-0.019 (0.016)	0.042 (0.036)	-0.023 (0.019)
ln Geographic distance (mean)	-0.006 (0.007)	-0.048** (0.016)	-0.027** (0.008)
Intercept	0.186*** (0.055)	0.875*** (0.123)	0.363*** (0.065)
Model	m5.1_bv_fc_df_ti	m5.1_bv_fc_df3l_ti	m5.1_bv_fc_dft_ti
Observations	2970	2764	2786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDPpc I	Overall IPR	
	df	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables		
ipr_tripsplus_copyrights_related_rights	-0.069*** (0.02)	-0.065. (0.037)
ipr_tripsplus_trademarks	0.027. (0.015)	0.02 (0.02)
ipr_tripsplus_geo_indications	-0.018*** (0.005)	-0.022** (0.008)
ipr_tripsplus_industrial_design	0.033 (0.035)	0.086 (0.06)
ipr_tripsplus_patents	0.072** (0.024)	0.027 (0.033)
ipr_tripsplus_undisclosed_information	0.028 (0.03)	0.043 (0.039)
ipr_tripsplus_layout_design	-0.175 (0.139)	0.042 (0.167)
ipr_tripsplus_new_plant_varieties	0.004 (0.027)	-0.021 (0.038)
ipr_tripsplus_trad_knowledge_genetic_resources	0.016 (0.01)	0.008 (0.013)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	-0.072 (0.063)	0.046 (0.085)
ipr_tripsplus_domain_names	-0.137 (0.116)	-0.054 (0.16)
ipr_tripsplus_enforcement	-0.01*** (0.003)	-0.005 (0.006)
ipr_tripsplus_exhaustion	-0.001 (0.009)	-0.003 (0.046)
Control Variables		
Democratisation (Polity 2) (mean)	0.002* (0.001)	0.004*** (0.001)
Classic IP leaders	0.021. (0.013)	0.012 (0.015)
Countries with a high increase of patent protection	0.013 (0.012)	0.012 (0.014)
New IP producers and developers	-0.007 (0.015)	-0.014 (0.018)
ln Geographic distance (mean)	-0.009 (0.007)	-0.031*** (0.008)
Intercept	0.169** (0.052)	0.36*** (0.062)
Model	m5.2_bv_df_ti	m5.2_bv_dft_ti
Observations	2970	2786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDPpc II	First-comer IPR			
	df	*df3l*	*df5l*	*dft*
Variables	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables				
ipr_tripsplus_copyrights_related_rights	-0.055* (0.024)	0.045 (0.057)	0.003 (0.127)	-0.039 (0.04)
ipr_tripsplus_trademarks	0.055** (0.019)	0.001 (0.04)	-0.052 (0.068)	0.05* (0.023)
ipr_tripsplus_geo_indications	-0.012 (0.01)	0.001 (0.028)	-0.007 (0.056)	-0.019 (0.014)
ipr_tripsplus_industrial_design	0.009 (0.055)	-0.004 (0.115)	0.056 (0.229)	0.078 (0.073)
ipr_tripsplus_patents	0.013 (0.025)	-0.093 (0.059)	-0.054 (0.109)	-0.001 (0.034)
ipr_tripsplus_undisclosed_information	0.027 (0.048)	-0.068 (0.104)	-0.332. (0.199)	-0.048 (0.063)
ipr_tripsplus_layout_design	-0.014 (0.173)	0.512 (0.367)	0.464 (0.641)	0.061 (0.213)
ipr_tripsplus_new_plant_varieties	0.019 (0.041)	-0.05 (0.087)	-0.081 (0.159)	-0.027 (0.055)
ipr_tripsplus_trad_knowledge_genetic_resources	-0.006 (0.01)	-0.072*** (0.021)	-0.083 (0.137)	-0.01 (0.012)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	-0.05 (0.105)	0.18 (0.219)	0.744. (0.43)	NA
ipr_tripsplus_domain_names	0.046 (0.142)	0.648* (0.306)	0.786 (0.549)	-0.002 (0.178)
ipr_tripsplus_enforcement	-0.008** (0.003)	-0.009 (0.007)	-0.015 (0.018)	0.004 (0.009)
ipr_tripsplus_exhaustion	-0.02. (0.011)	-0.084*** (0.024)	-0.105 (0.156)	-0.019 (0.053)
Control Variables				
Democratisation (Polity 2) (mean)	0.001 (0.001)	0 (0.002)	-0.002 (0.003)	0.004** (0.001)
Classic IP leaders	-0.001 (0.013)	0.007 (0.027)	-0.009 (0.045)	0.004 (0.015)
Countries with a high increase of patent protection	0.018 (0.012)	0.029 (0.025)	0.048 (0.042)	0.016 (0.014)
New IP producers and developers	-0.013 (0.015)	0.047 (0.032)	0.026 (0.054)	-0.016 (0.018)
ln Geographic distance (mean)	-0.014* (0.007)	-0.067*** (0.014)	-0.113*** (0.024)	-0.036*** (0.008)
Intercept	0.206*** (0.051)	0.891*** (0.107)	1.501*** (0.182)	0.395*** (0.061)
Model	m5.2_bv_fc_df_ti	m5.2_bv_fc_df3l_ti	m5.2_bv_fc_df5l_ti	m5.2_bv_fc_dft_ti
Observations	2970	2764	2653	2786

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDP Growth Rate	FC IPR
Variables	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables	
ipr_tripsplus_copyrights_related_rights	1.544 (1.823)
ipr_tripsplus_trademarks	0.913 (1.049)
ipr_tripsplus_geo_indications	-0.371 (0.627)
ipr_tripsplus_industrial_design	1.243 (3.309)
ipr_tripsplus_patents	-0.155 (1.553)
ipr_tripsplus_undisclosed_information	-5.046. (2.859)
ipr_tripsplus_layout_design	-0.892 (9.666)
ipr_tripsplus_new_plant_varieties	-0.517 (2.51)
ipr_tripsplus_trad_knowledge_genetic_resources	-0.432 (0.555)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	6.936 (6.272)
ipr_tripsplus_domain_names	-1.831 (8.1)
ipr_tripsplus_enforcement	0.01 (0.43)
ipr_tripsplus_exhaustion	-1.188 (2.392)
Control Variables	
Democratisation (Polity 2) (mean)	-0.043 (0.052)
Classic IP leaders	1.46* (0.699)
Countries with a high increase of patent protection	-0.483 (0.666)
New IP producers and developers	0.74 (0.833)
ln Geographic distance (mean)	0.093 (0.367)
Intercept	-0.775 (2.838)
Model	m5.3_bv_fc_dft_si
Observations	2684

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Growth: GDPpc Growth Rate	Overall IPR *df3l*	FC IPR *df3l*
Variables	Estimates (Std. Error)	Estimates (Std. Error)
IPR TRIPS-plus Additive Variables		
ipr_tripsplus_copyrights_related_rights	2.433 (1.674)	-0.713 (1.721)
ipr_tripsplus_trademarks	-0.733 (1.09)	-1.15 (1.204)
ipr_tripsplus_geo_indications	-0.071 (0.53)	-0.222 (0.882)
ipr_tripsplus_industrial_design	-6.617* (2.964)	-4.627 (3.46)
ipr_tripsplus_patents	-1.163 (1.658)	0.037 (1.797)
ipr_tripsplus_undisclosed_information	-0.68 (2.217)	-0.185 (3.138)
ipr_tripsplus_layout_design	4.412 (9.355)	-4.393 (11.097)
ipr_tripsplus_new_plant_varieties	7.281*** (2.085)	9.384*** (2.625)
ipr_tripsplus_trad_knowledge_genetic_resources	-0.436 (0.745)	0.075 (0.638)
ipr_tripsplus_encrypted_program_carrying_satellite_signals	0.577 (5.367)	0.825 (6.641)
ipr_tripsplus_domain_names	-1.612 (8.843)	1.337 (9.297)
ipr_tripsplus_enforcement	-0.039 (0.2)	-0.089 (0.203)
ipr_tripsplus_exhaustion	-0.366 (0.841)	-0.147 (0.734)
Control Variables		
Democratisation (Polity 2) (mean)	0.001 (0.061)	0.009 (0.06)
Classic IP leaders	0.333 (0.821)	0.346 (0.815)
Countries with a high increase of patent protection	-0.311 (0.782)	-0.409 (0.777)
New IP producers and developers	0.291 (0.975)	0.45 (0.975)
ln Geographic distance (mean)	-0.95* (0.438)	-0.895* (0.429)
Intercept	6.663* (3.375)	6.309. (3.313)
Model	m5.4_bv_df3l_ti	m5.4_bv_fc_df3l_ti
Observations	2661	2661

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 65: Significant Models of High-income Countries (HIC)

HIC Model	Significant IPR Indexes	Estimates (Std. Error)
m1_df_si	ipr_specific_sum	-0.003. (0.001)
m1_df5l_gi	ipr_general_sum	0.006* (0.002)
m1_df10l_gi	ipr_general_sum	0.006. (0.003)
m1_dft_gi	ipr_general_sum	0.003* (0.001)
m1_fc_df_si	ipr_specific_sum_fc	-0.011* (0.005)
m1_fc_df_ti	ipr_tripsplus_per_pta_fc	-0.003* (0.001)
m2.1_dft_gi	ipr_general_sum	1.325. (0.749)
m2.2_df_si	ipr_specific_sum	-0.042*** (0.012)
m2.2_df_ti	ipr_tripsplus_per_pta	-0.01* (0.004)
m2.2_df3l_si	ipr_specific_sum	-0.104*** (0.02)
m2.2_df3l_ti	ipr_tripsplus_per_pta	-0.038*** (0.007)
m2.2_df5l_si	ipr_specific_sum	-0.15*** (0.036)
m2.2_df5l_ti	ipr_tripsplus_per_pta	-0.067*** (0.016)
m2.2_dft_gi	ipr_general_sum	0.042*** (0.012)
m2.2_dft_si	ipr_specific_sum	-0.035* (0.017)
m2.2_fc_df3l_ti	ipr_tripsplus_per_pta_fc	-0.06** (0.02)
m2.2_fc_df5l_ti	ipr_tripsplus_per_pta_fc	-0.084** (0.029)
m3.1_df_si	ipr_specific_sum	-0.007*** (0.001)
m3.1_df_ti	ipr_tripsplus_per_pta	-0.002*** (0)
m3.1_df3l_si	ipr_specific_sum	-0.014*** (0.003)
m3.1_df3l_ti	ipr_tripsplus_per_pta	-0.005*** (0.001)
m3.1_df5l_si	ipr_specific_sum	-0.014* (0.005)
m3.1_df5l_ti	ipr_tripsplus_per_pta	-0.005* (0.002)
m3.1_df10l_gi	ipr_general_sum	0.008. (0.005)

HIC Model	Significant IPR Indexes	Estimates (Std. Error)
m3.1_dft_gi	ipr_general_sum	0.004* (0.001)
m3.1_dft_si	ipr_specific_sum	-0.005* (0.002)
m3.1_dft_ti	ipr_tripsplus_per_pta	-0.002* (0.001)
m3.1_fc_df_ti	ipr_tripsplus_per_pta_fc	-0.004** (0.001)
m3.1_fc_df3l_si	ipr_specific_sum_fc	-0.018* (0.008)
m3.1_fc_df3l_ti	ipr_tripsplus_per_pta_fc	-0.005* (0.002)
m3.1_fc_df5l_gi	ipr_general_sum_fc	-0.016. (0.009)
m3.1_fc_df5l_si	ipr_specific_sum_fc	-0.018. (0.01)
m3.1_fc_df5l_ti	ipr_tripsplus_per_pta_fc	-0.005. (0.003)
m3.2_df_gi	ipr_general_sum	-0.015*** (0.003)
m3.2_df_si	ipr_specific_sum	-0.021*** (0.004)
m3.2_df_ti	ipr_tripsplus_per_pta	-0.006*** (0.001)
m3.2_df3l_gi	ipr_general_sum	-0.037* (0.015)
m3.2_df5l_gi	ipr_general_sum	-0.052. (0.029)
m3.2_dft_gi	ipr_general_sum	0.015** (0.005)
m3.2_fc_df_gi	ipr_general_sum_fc	-0.026** (0.01)
m3.2_fc_df_ti	ipr_tripsplus_per_pta_fc	-0.011* (0.005)
m3.2_fc_df3l_ti	ipr_tripsplus_per_pta_fc	-0.034. (0.019)
m3.2_fc_dft_si	ipr_specific_sum_fc	0.074*** (0.018)
m3.3_df_gi	ipr_general_sum	-0.217** (0.077)
m3.3_df_si	ipr_specific_sum	-0.19. (0.1)
m3.3_df_ti	ipr_tripsplus_per_pta	-0.066. (0.035)
m3.3_df3l_gi	ipr_general_sum	-0.365* (0.155)
m3.3_df3l_si	ipr_specific_sum	-0.363. (0.215)
m3.3_fc_dft_si	ipr_specific_sum_fc	0.815. (0.463)

HIC Model	Significant IPR Indexes	Estimates (Std. Error)
m3.4_df_gi	ipr_general_sum	-0.01** (0.003)
m3.4_df_si	ipr_specific_sum	-0.02*** (0.004)
m3.4_df_ti	ipr_tripsplus_per_pta	-0.006*** (0.001)
m3.4_df3l_gi	ipr_general_sum	-0.024** (0.009)
m3.4_df3l_si	ipr_specific_sum	-0.029* (0.013)
m3.4_df3l_ti	ipr_tripsplus_per_pta	-0.012* (0.005)
m3.4_df5l_gi	ipr_general_sum	-0.029. (0.017)
m3.4_df10l_gi	ipr_general_sum	-0.245* (0.097)
m3.4_dft_gi	ipr_general_sum	0.022*** (0.005)
m3.4_fc_df_gi	ipr_general_sum_fc	-0.016. (0.009)
m3.4_fc_df_ti	ipr_tripsplus_per_pta_fc	-0.008. (0.004)
m3.4_fc_df3l_ti	ipr_tripsplus_per_pta_fc	-0.025* (0.012)
m3.4_fc_df10l_ti	ipr_tripsplus_per_pta_fc	-0.378* (0.173)
m3.4_fc_dft_gi	ipr_general_sum_fc	0.034* (0.015)
m3.4_fc_dft_si	ipr_specific_sum_fc	0.08*** (0.017)
m3.4_fc_dft_ti	ipr_tripsplus_per_pta_fc	0.016. (0.009)
m4.1_df_gi	ipr_general_sum	-0.007* (0.003)
m4.1_df_si	ipr_specific_sum	-0.012*** (0.003)
m4.1_df_ti	ipr_tripsplus_per_pta	-0.004*** (0.001)
m4.1_df3l_gi	ipr_general_sum	-0.019** (0.007)
m4.1_df3l_si	ipr_specific_sum	-0.016. (0.009)
m4.1_df3l_ti	ipr_tripsplus_per_pta	-0.007* (0.003)
m4.1_df5l_gi	ipr_general_sum	-0.024* (0.012)
m4.1_df10l_gi	ipr_general_sum	-0.099* (0.048)
m4.1_dft_gi	ipr_general_sum	0.013* (0.006)

HIC Model	Significant IPR Indexes	Estimates (Std. Error)
m4.1_fc_dft_gi	ipr_general_sum_fc	0.031. (0.017)
m4.1_fc_dft_si	ipr_specific_sum_fc	0.088*** (0.02)
m4.1_fc_dft_ti	ipr_tripsplus_per_pta_fc	0.017. (0.01)
m4.2_df_gi	ipr_general_sum	-0.003** (0.001)
m4.2_df_si	ipr_specific_sum	-0.003* (0.001)
m4.2_df3l_gi	ipr_general_sum	-0.014* (0.007)
m4.2_df5l_gi	ipr_general_sum	-0.021. (0.012)
m4.2_df10l_gi	ipr_general_sum	-0.05* (0.022)
m4.2_dft_gi	ipr_general_sum	0.003* (0.001)
m4.2_fc_df_gi	ipr_general_sum_fc	-0.006* (0.003)
m4.2_fc_dft_si	ipr_specific_sum_fc	0.016*** (0.004)
m4.2_fc_dft_ti	ipr_tripsplus_per_pta_fc	0.006** (0.002)
m4.3_df3l_gi	ipr_general_sum	-0.187* (0.082)
m4.3_df5l_gi	ipr_general_sum	-0.215* (0.091)
m4.3_df10l_gi	ipr_general_sum	-0.226* (0.109)
m4.3_dft_ti	ipr_tripsplus_per_pta	-0.275* (0.115)
m4.3_fc_df_ti	ipr_tripsplus_per_pta_fc	-0.108* (0.054)
m4.3_fc_df3l_si	ipr_specific_sum_fc	-0.798. (0.435)
m4.3_fc_df3l_ti	ipr_tripsplus_per_pta_fc	-0.178. (0.106)
m4.3_fc_df5l_si	ipr_specific_sum_fc	-0.803. (0.471)
m4.3_fc_df5l_ti	ipr_tripsplus_per_pta_fc	-0.275* (0.13)
m4.3_fc_df10l_gi	ipr_general_sum_fc	-0.841. (0.467)
m4.3_fc_df10l_si	ipr_specific_sum_fc	-0.962. (0.574)
m4.3_fc_df10l_ti	ipr_tripsplus_per_pta_fc	-0.558. (0.32)
m4.3_fc_dft_ti	ipr_tripsplus_per_pta_fc	-0.913* (0.425)

HIC Model	Significant IPR Indexes	Estimates (Std. Error)
m4.4_df5l_ti	ipr_tripsplus_per_pta	2.597*** (0.713)
m4.4_df10l_si	ipr_specific_sum	2.177*** (0.57)
m4.4_df10l_ti	ipr_tripsplus_per_pta	3*** (0.298)
m4.4_dft_gi	ipr_general_sum	-4.624* (1.873)
m4.4_dft_si	ipr_specific_sum	-8.211** (2.733)
m4.4_dft_ti	ipr_tripsplus_per_pta	-3.772*** (1.087)
m4.4_fc_df_si	ipr_specific_sum_fc	-14.099. (7.736)
m4.4_fc_df_ti	ipr_tripsplus_per_pta_fc	-6.704*** (1.825)
m4.4_fc_df3l_si	ipr_specific_sum_fc	-5.44. (2.993)
m4.4_fc_df3l_ti	ipr_tripsplus_per_pta_fc	-2.781*** (0.713)
m4.4_fc_df5l_si	ipr_specific_sum_fc	-10.07* (4.83)
m4.4_fc_df5l_ti	ipr_tripsplus_per_pta_fc	-4.999*** (1.247)
m4.4_fc_df10l_si	ipr_specific_sum_fc	-2.643. (1.452)
m4.4_fc_df10l_ti	ipr_tripsplus_per_pta_fc	-1.781** (0.582)
m4.4_fc_dft_ti	ipr_tripsplus_per_pta_fc	-8.92* (4.026)
m4.5_df5l_ti	ipr_tripsplus_per_pta	0* (0)
m4.5_df10l_ti	ipr_tripsplus_per_pta	0* (0)
m4.5_dft_si	ipr_specific_sum	0. (0)
m4.5_dft_ti	ipr_tripsplus_per_pta	0. (0)
m4.5_fc_df3l_gi	ipr_general_sum_fc	0. (0)
m4.5_fc_df3l_si	ipr_specific_sum_fc	0. (0)
m4.5_fc_df3l_ti	ipr_tripsplus_per_pta_fc	0. (0)
m4.5_fc_df5l_si	ipr_specific_sum_fc	0** (0)
m4.5_fc_df5l_ti	ipr_tripsplus_per_pta_fc	0** (0)
m4.5_fc_df10l_si	ipr_specific_sum_fc	0. (0)

HIC Model	Significant IPR Indexes	Estimates (Std. Error)
m4.5_fc_df10l_ti	ipr_tripsplus_per_pta_fc	0* (0)
m4.6_df10l_ti	ipr_tripsplus_per_pta	0* (0)
m4.7_df3l_ti	ipr_tripsplus_per_pta	0. (0)
m4.7_fc_df_si	ipr_specific_sum_fc	0.018. (0.01)
m4.8_df_ti	ipr_tripsplus_per_pta	-658.21* (276.41)
m4.8_df3l_si	ipr_specific_sum	-3331332* (1662991)
m4.8_df3l_ti	ipr_tripsplus_per_pta	-1863838** (563603)
m4.8_df5l_si	ipr_specific_sum	-2876723. (1536855)
m4.8_df5l_ti	ipr_tripsplus_per_pta	-1618789** (510330)
m4.8_df10l_ti	ipr_tripsplus_per_pta	-1243606* (554744)
m4.8_dft_si	ipr_specific_sum	-2738425. (1417937)
m4.8_dft_ti	ipr_tripsplus_per_pta	-1552711** (475121)
m4.8_fc_df10l_si	ipr_specific_sum_fc	-2924389. (1670443)
m4.9_df_ti	ipr_tripsplus_per_pta	-403.6. (205.7)
m4.9_df3l_ti	ipr_tripsplus_per_pta	-1821086** (664231)
m4.9_df5l_ti	ipr_tripsplus_per_pta	-2055171** (732197)
m4.9_df10l_ti	ipr_tripsplus_per_pta	-2168622. (1093741)
m4.9_dft_ti	ipr_tripsplus_per_pta	-1543699** (533351)
m4.10_fc_df3l_gi	ipr_general_sum_fc	187771* (75480)
m4.10_fc_df3l_si	ipr_specific_sum_fc	181334. (104918)
m4.10_fc_df5l_gi	ipr_general_sum_fc	147800* (63473)
m4.10_fc_dft_gi	ipr_general_sum_fc	104101. (58755)
m4.11_df_ti	ipr_tripsplus_per_pta	-349.9* (162.6)
m4.11_df3l_si	ipr_specific_sum	-2000047. (1044178)
m4.11_df3l_ti	ipr_tripsplus_per_pta	-1109823** (381207)

HIC Model	Significant IPR Indexes	Estimates (Std. Error)
m4.11_df5l_ti	ipr_tripsplus_per_pta	-1082825** (400823)
m4.11_df10l_ti	ipr_tripsplus_per_pta	-1092277* (483312)
m4.11_dft_si	ipr_specific_sum	-1880012* (932927)
m4.11_dft_ti	ipr_tripsplus_per_pta	-997847** (344001)
m4.11_fc_df10l_si	ipr_specific_sum_fc	-2617626. (1453719)
m4.12_df10l_si	ipr_specific_sum	0. (0)
m4.12_df10l_ti	ipr_tripsplus_per_pta	0* (0)
m4.12_fc_df_si	ipr_specific_sum_fc	0.019. (0.011)
m5.1_df_gi	ipr_general_sum	-0.002* (0.001)
m5.1_df_si	ipr_specific_sum	-0.012*** (0.001)
m5.1_df_ti	ipr_tripsplus_per_pta	-0.005*** (0)
m5.1_df3l_gi	ipr_general_sum	-0.012*** (0.002)
m5.1_df3l_si	ipr_specific_sum	-0.035*** (0.003)
m5.1_df3l_ti	ipr_tripsplus_per_pta	-0.012*** (0.001)
m5.1_df5l_gi	ipr_general_sum	-0.024*** (0.003)
m5.1_df5l_si	ipr_specific_sum	-0.052*** (0.006)
m5.1_df5l_ti	ipr_tripsplus_per_pta	-0.019*** (0.003)
m5.1_df10l_gi	ipr_general_sum	-0.05*** (0.006)
m5.1_df10l_si	ipr_specific_sum	-0.073*** (0.014)
m5.1_df10l_ti	ipr_tripsplus_per_pta	-0.033*** (0.008)
m5.1_dft_gi	ipr_general_sum	0.007*** (0.001)
m5.1_dft_si	ipr_specific_sum	-0.01*** (0.002)
m5.1_dft_ti	ipr_tripsplus_per_pta	-0.004*** (0.001)
m5.1_fc_df_gi	ipr_general_sum_fc	-0.006. (0.003)
m5.1_fc_df_ti	ipr_tripsplus_per_pta_fc	-0.004* (0.002)

HIC Model	Significant IPR Indexes	Estimates (Std. Error)
m5.1_fc_df3l_si	ipr_specific_sum_fc	-0.017* (0.008)
m5.1_fc_df3l_ti	ipr_tripsplus_per_pta_fc	-0.017*** (0.003)
m5.1_fc_df5l_si	ipr_specific_sum_fc	-0.04** (0.012)
m5.1_fc_df5l_ti	ipr_tripsplus_per_pta_fc	-0.024*** (0.005)
m5.1_fc_df10l_gi	ipr_general_sum_fc	-0.034. (0.018)
m5.1_fc_df10l_si	ipr_specific_sum_fc	-0.057** (0.022)
m5.1_fc_df10l_ti	ipr_tripsplus_per_pta_fc	-0.038** (0.013)
m5.2_df_gi	ipr_general_sum	-0.002* (0.001)
m5.2_df_si	ipr_specific_sum	-0.012*** (0.001)
m5.2_df_ti	ipr_tripsplus_per_pta	-0.005*** (0)
m5.2_df3l_gi	ipr_general_sum	-0.012*** (0.002)
m5.2_df3l_si	ipr_specific_sum	-0.033*** (0.003)
m5.2_df3l_ti	ipr_tripsplus_per_pta	-0.012*** (0.001)
m5.2_df5l_gi	ipr_general_sum	-0.025*** (0.003)
m5.2_df5l_si	ipr_specific_sum	-0.05*** (0.006)
m5.2_df5l_ti	ipr_tripsplus_per_pta	-0.019*** (0.003)
m5.2_df10l_gi	ipr_general_sum	-0.049*** (0.004)
m5.2_df10l_si	ipr_specific_sum	-0.061*** (0.011)
m5.2_df10l_ti	ipr_tripsplus_per_pta	-0.026*** (0.006)
m5.2_dft_gi	ipr_general_sum	0.006*** (0.001)
m5.2_dft_si	ipr_specific_sum	-0.009*** (0.002)
m5.2_dft_ti	ipr_tripsplus_per_pta	-0.004*** (0.001)
m5.2_fc_df_ti	ipr_tripsplus_per_pta_fc	-0.003* (0.002)
m5.2_fc_df3l_si	ipr_specific_sum_fc	-0.018* (0.008)
m5.2_fc_df3l_ti	ipr_tripsplus_per_pta_fc	-0.016*** (0.003)

HIC Model	Significant IPR Indexes	Estimates (Std. Error)
m5.2_fc_df5l_gi	ipr_general_sum_fc	-0.017. (0.009)
m5.2_fc_df5l_si	ipr_specific_sum_fc	-0.039*** (0.011)
m5.2_fc_df5l_ti	ipr_tripsplus_per_pta_fc	-0.023*** (0.005)
m5.2_fc_df10l_gi	ipr_general_sum_fc	-0.031* (0.014)
m5.2_fc_df10l_si	ipr_specific_sum_fc	-0.044** (0.017)
m5.2_fc_df10l_ti	ipr_tripsplus_per_pta_fc	-0.026** (0.01)
m5.3_df3l_g	ipr_general_sum	0.209* (0.096)
m5.3_df5l_gi	ipr_general_sum	0.331** (0.124)
m5.3_df10l_gi	ipr_general_sum	0.215** (0.083)
m5.3_fc_df3l_gi	ipr_general_sum_fc	0.835* (0.325)
m5.3_fc_dft_gi	ipr_general_sum_fc	0.624* (0.314)

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 66: Significant Models of Upper-middle-income Countries (UMIC)

UMIC Model	Significant IPR Indexes	Estimates (Std. Error)
m1_fc_df_si	ipr_specific_sum_fc	-0.086* (0.038)
m1_fc_df3l_gi	ipr_general_sum_fc	-0.025* (0.012)
m1_fc_df5l_gi	ipr_general_sum_fc	-0.036* (0.016)
m1_fc_df10l_gi	ipr_general_sum_fc	-0.118*** (0.034)
m1_fc_df10l_si	ipr_specific_sum_fc	-0.261* (0.131)
m2.2_fc_df5l_gi	ipr_general_sum_fc	9.691* (4.561)
m3.1_df_gi	ipr_general_sum	-0.013*** (0.003)
m3.1_df_si	ipr_specific_sum	-0.018** (0.006)
m3.1_df_ti	ipr_tripsplus_per_pta	-0.006** (0.002)
m3.1_df3l_gi	ipr_general_sum	-0.017** (0.006)
m3.1_df5l_ti	ipr_tripsplus_per_pta	0.017* (0.008)
m3.1_df10l_ti	ipr_tripsplus_per_pta	0.046* (0.019)
m3.1_dft_gi	ipr_general_sum	-0.01** (0.003)
m3.1_dft_si	ipr_specific_sum	-0.016* (0.006)
m3.1_dft_ti	ipr_tripsplus_per_pta	-0.006* (0.003)
m3.1_fc_df_gi	ipr_general_sum_fc	-0.025. (0.015)
m3.1_fc_df_ti	ipr_tripsplus_per_pta_fc	-0.01* (0.004)
m3.1_fc_df3l_si	ipr_specific_sum_fc	-0.061. (0.036)
m3.1_fc_df10l_ti	ipr_tripsplus_per_pta_fc	0.14*** (0.034)
m3.2_dft_gi	ipr_general_sum	0.016* (0.007)
m3.3_df_gi	ipr_general_sum	-0.097. (0.054)
m3.3_df5l_gi	ipr_general_sum	-0.633. (0.328)
m3.3_df10l_gi	ipr_general_sum	-1.261** (0.481)
m3.3_fc_df_gi	ipr_general_sum_fc	-0.206. (0.123)

UMIC Model	Significant IPR Indexes	Estimates (Std. Error)
m3.3_fc_df5l_gi	ipr_general_sum_fc	-1.211. (0.711)
m3.4_df_si	ipr_specific_sum	-0.009* (0.004)
m3.4_df_ti	ipr_tripsplus_per_pta	-0.003. (0.002)
m3.4_dft_gi	ipr_general_sum	0.012** (0.004)
m4.1_df_gi	ipr_general_sum	0.01. (0.005)
m4.1_df_ti	ipr_tripsplus_per_pta	0.01* (0.004)
m4.1_df3l_gi	ipr_general_sum	0.027* (0.012)
m4.1_df3l_ti	ipr_tripsplus_per_pta	0.016. (0.01)
m4.1_df5l_gi	ipr_general_sum	0.046* (0.018)
m4.1_df5l_ti	ipr_tripsplus_per_pta	0.042* (0.017)
m4.1_df10l_gi	ipr_general_sum	0.099** (0.036)
m4.1_dft_gi	ipr_general_sum	0.034*** (0.009)
m4.1_dft_si	ipr_specific_sum	0.048** (0.018)
m4.1_dft_ti	ipr_tripsplus_per_pta	0.03*** (0.008)
m4.1_fc_df_si	ipr_specific_sum_fc	0.04* (0.019)
m4.1_fc_df_ti	ipr_tripsplus_per_pta_fc	0.043*** (0.007)
m4.1_fc_df3l_si	ipr_specific_sum_fc	0.089* (0.043)
m4.1_fc_df3l_ti	ipr_tripsplus_per_pta_fc	0.068*** (0.016)
m4.1_fc_df5l_si	ipr_specific_sum_fc	0.119. (0.065)
m4.1_fc_df5l_ti	ipr_tripsplus_per_pta_fc	0.088*** (0.024)
m4.1_fc_dft_si	ipr_specific_sum_fc	0.128*** (0.036)
m4.1_fc_dft_ti	ipr_tripsplus_per_pta_fc	0.112*** (0.014)
m4.2_df3l_gi	ipr_general_sum	0.009. (0.005)
m4.2_df10l_ti	ipr_tripsplus_per_pta	0.042* (0.02)
m4.2_dft_gi	ipr_general_sum	0.016*** (0.004)

UMIC Model	Significant IPR Indexes	Estimates (Std. Error)
m4.2_fc_df10l_gi	ipr_general_sum_fc	-0.053. (0.031)
m4.2_fc_dft_ti	ipr_tripsplus_per_pta_fc	0.012. (0.007)
m4.3_df10l_si	ipr_specific_sum	0.282. (0.154)
m4.3_fc_df10l_si	ipr_specific_sum_fc	0.341. (0.178)
m4.4_df10l_gi	ipr_general_sum	-0.619. (0.316)
m4.5_df10l_ti	ipr_tripsplus_per_pta	0* (0)
m4.5_fc_df3l_si	ipr_specific_sum_fc	0. (0)
m4.6_df10l_si	ipr_specific_sum	0. (0)
m4.6_fc_df10l_gi	ipr_general_sum_fc	0* (0)
m4.6_fc_df10l_si	ipr_specific_sum_fc	0. (0)
m4.6_fc_df10l_ti	ipr_tripsplus_per_pta_fc	0. (0)
m4.7_df3l_si	ipr_specific_sum	0* (0)
m4.7_df3l_ti	ipr_tripsplus_per_pta	0* (0)
m4.7_df5l_si	ipr_specific_sum	0** (0)
m4.7_df5l_ti	ipr_tripsplus_per_pta	0* (0)
m4.7_df10l_si	ipr_specific_sum	0. (0)
m4.7_fc_df3l_si	ipr_specific_sum_fc	0. (0)
m4.7_fc_df3l_ti	ipr_tripsplus_per_pta_fc	0* (0)
m4.7_fc_df5l_gi	ipr_general_sum_fc	0*** (0)
m4.7_fc_df5l_si	ipr_specific_sum_fc	0* (0)
m4.7_fc_df5l_ti	ipr_tripsplus_per_pta_fc	0* (0)
m4.7_fc_df10l_gi	ipr_general_sum_fc	0. (0)
m4.7_fc_df10l_si	ipr_specific_sum_fc	0. (0)
m4.7_fc_dft_gi	ipr_general_sum_fc	0* (0)
m4.8_df_gi	ipr_general_sum	786.8. (475.3)

UMIC Model	Significant IPR Indexes	Estimates (Std. Error)
m4.10_df5l_gi	ipr_general_sum	81134* (40210)
m4.10_df10l_gi	ipr_general_sum	87421* (40510)
m4.10_df10l_si	ipr_specific_sum	252905*** (72857)
m4.10_df10l_ti	ipr_tripsplus_per_pta	120990*** (33147)
m4.12_df_gi	ipr_general_sum	-0.011. (0.007)
m4.12_df_si	ipr_specific_sum	-0.023. (0.014)
m4.12_df10l_ti	ipr_tripsplus_per_pta	0* (0)
m4.12_dft_gi	ipr_general_sum	0. (0)
m4.12_fc_df5l_gi	ipr_general_sum_fc	0** (0)
m4.12_fc_df5l_si	ipr_specific_sum_fc	0* (0)
m4.12_fc_dft_gi	ipr_general_sum_fc	0* (0)
m5.1_df_si	ipr_specific_sum	-0.009. (0.005)
m5.1_df3l_si	ipr_specific_sum	-0.024* (0.009)
m5.1_df3l_ti	ipr_tripsplus_per_pta	-0.009* (0.004)
m5.1_dft_gi	ipr_general_sum	0.009** (0.003)
m5.1_fc_df_gi	ipr_general_sum_fc	0.013* (0.006)
m5.1_fc_df3l_gi	ipr_general_sum_fc	0.04*** (0.011)
m5.1_fc_df5l_gi	ipr_general_sum_fc	0.063*** (0.017)
m5.1_fc_dft_gi	ipr_general_sum_fc	0.027*** (0.007)
m5.1_fc_dft_si	ipr_specific_sum_fc	0.028* (0.012)
m5.1_fc_dft_ti	ipr_tripsplus_per_pta_fc	0.015** (0.005)
m5.2_df_si	ipr_specific_sum	-0.008. (0.005)
m5.2_df3l_si	ipr_specific_sum	-0.023* (0.009)
m5.2_df3l_ti	ipr_tripsplus_per_pta	-0.008* (0.004)
m5.2_df10l_gi	ipr_general_sum	0.023. (0.012)

UMIC Model	Significant IPR Indexes	Estimates (Std. Error)
m5.2_dft_gi	ipr_general_sum	0.01** (0.003)
m5.2_fc_df_gi	ipr_general_sum_fc	0.013* (0.006)
m5.2_fc_df3l_gi	ipr_general_sum_fc	0.035** (0.011)
m5.2_fc_df5l_gi	ipr_general_sum_fc	0.055*** (0.016)
m5.2_fc_dft_gi	ipr_general_sum_fc	0.025*** (0.007)
m5.2_fc_dft_si	ipr_specific_sum_fc	0.025* (0.012)
m5.2_fc_dft_ti	ipr_tripsplus_per_pta_fc	0.012* (0.005)

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 67: Significant Models of Lower-middle-income Countries (LMIC)

LMIC Model	Significant IPR Indexes	Estimates (Std. Error)
m1_df_gi	ipr_general_sum	0.006* (0.002)
m1_df_si	ipr_specific_sum	0.031*** (0.008)
m1_df_ti	ipr_tripsplus_per_pta	0.012*** (0.003)
m1_df10l_gi	ipr_general_sum	0.102. (0.054)
m1_dft_gi	ipr_general_sum	0.007** (0.003)
m1_dft_si	ipr_specific_sum	0.029** (0.009)
m1_dft_ti	ipr_tripsplus_per_pta	0.012* (0.005)
m1_fc_df_gi	ipr_general_sum_fc	-0.011* (0.005)
m1_fc_dft_gi	ipr_general_sum_fc	-0.01. (0.006)
m1_fc_dft_ti	ipr_tripsplus_per_pta_fc	0.012. (0.006)
m3.1_df5l_gi	ipr_general_sum	-0.015* (0.007)
m3.3_fc_df3l_gi	ipr_general_sum_fc	0.594. (0.35)
m3.3_fc_df5l_gi	ipr_general_sum_fc	1.182* (0.499)
m3.4_df5l_gi	ipr_general_sum	-0.234. (0.129)
m3.4_df10l_gi	ipr_general_sum	-0.418. (0.218)
m4.2_df10l_gi	ipr_general_sum	-0.435. (0.242)
m4.3_df_ti	ipr_tripsplus_per_pta	-0.121. (0.067)
m4.3_fc_df10l_gi	ipr_general_sum_fc	-0.353. (0.203)
m4.5_df5l_gi	ipr_general_sum	0. (0)
m4.5_df5l_si	ipr_specific_sum	0** (0)
m4.5_df5l_ti	ipr_tripsplus_per_pta	0*** (0)
m4.5_df10l_gi	ipr_general_sum	0* (0)
m4.5_df10l_si	ipr_specific_sum	0*** (0)
m4.5_df10l_ti	ipr_tripsplus_per_pta	0*** (0)

LMIC Model	Significant IPR Indexes	Estimates (Std. Error)
m4.5_fc_df3l_gi	ipr_general_sum_fc	0* (0)
m4.5_fc_df5l_si	ipr_specific_sum_fc	0** (0)
m4.6_df5l_si	ipr_specific_sum	0. (0)
m4.6_df5l_ti	ipr_tripsplus_per_pta	0*** (0)
m4.6_dft_gi	ipr_general_sum	0. (0)
m4.9_df_gi	ipr_general_sum	1.256* (0.506)
m4.12_df5l_gi	ipr_general_sum	0* (0)
m4.12_df10l_gi	ipr_general_sum	0. (0)
m5.1_df_gi	ipr_general_sum	0.007* (0.003)
m5.1_df3l_gi	ipr_general_sum	0.015* (0.007)
m5.1_dft_gi	ipr_general_sum	0.012*** (0.003)
m5.1_fc_df_gi	ipr_general_sum_fc	0.018*** (0.005)
m5.1_fc_df3l_gi	ipr_general_sum_fc	0.034** (0.013)
m5.1_fc_dft_gi	ipr_general_sum_fc	0.019** (0.006)
m5.2_df_gi	ipr_general_sum	0.007** (0.003)
m5.2_df3l_gi	ipr_general_sum	0.018** (0.006)
m5.2_df5l_gi	ipr_general_sum	0.027* (0.012)
m5.2_dft_gi	ipr_general_sum	0.012*** (0.003)
m5.2_fc_df_gi	ipr_general_sum_fc	0.017*** (0.005)
m5.2_fc_df3l_gi	ipr_general_sum_fc	0.032** (0.011)
m5.2_fc_dft_gi	ipr_general_sum_fc	0.017** (0.005)
m5.3_dft_ti	ipr_tripsplus_per_pta	0.133. (0.079)

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05

Appendix 68: Significant Models of Low-income Countries (LIC)

LIC Model	Significant IPR Indexes	Estimates (Std. Error)
m1_df3l_gi	ipr_general_sum	0.03. (0.016)
m1_df5l_gi	ipr_general_sum	0.052* (0.021)
m1_df10l_si	ipr_specific_sum	0.704*** (0.06)
m1_fc_df10l_si	ipr_specific_sum_fc	2.112*** (0.179)
m2.2_df3l_si	ipr_specific_sum	5.687* (2.804)
m2.2_fc_df3l_si	ipr_specific_sum_fc	5.687* (2.804)
m3.4_fc_dft_gi	ipr_general_sum_fc	0.052. (0.03)
m4.2_df_gi	ipr_general_sum	-0.016* (0.007)
m4.2_df3l_gi	ipr_general_sum	-0.045* (0.019)
m4.2_df5l_gi	ipr_general_sum	-0.08* (0.033)
m4.3_df_gi	ipr_general_sum	0.509. (0.201)
m4.4_df5l_gi	ipr_general_sum	1.152*** (0)
m4.4_df10l_gi	ipr_general_sum	0.887*** (0)
m4.4_fc_df_gi	ipr_general_sum_fc	1.732*** (0)
m4.4_fc_df5l_gi	ipr_general_sum_fc	1.152*** (0)
m4.4_fc_df10l_gi	ipr_general_sum_fc	0.887*** (0)
m4.5_df_si	ipr_specific_sum	-0.106** (0.037)
m4.5_df_ti	ipr_tripsplus_per_pta	-0.043** (0.016)
m4.5_df10l_si	ipr_specific_sum	0. (0)
m4.5_df10l_ti	ipr_tripsplus_per_pta	0. (0)
m4.5_fc_df_si	ipr_specific_sum_fc	-0.138** (0.047)
m4.5_fc_df_ti	ipr_tripsplus_per_pta_fc	-0.054** (0.018)
m4.5_fc_df10l_si	ipr_specific_sum_fc	0. (0)
m4.5_fc_df10l_ti	ipr_tripsplus_per_pta_fc	0. (0)

LIC Model	Significant IPR Indexes	Estimates (Std. Error)
m4.6_df_si	ipr_specific_sum	-0.092* (0.045)
m4.6_df_ti	ipr_tripsplus_per_pta	-0.034. (0.019)
m4.6_fc_df_si	ipr_specific_sum_fc	-0.117* (0.057)
m4.6_fc_df_ti	ipr_tripsplus_per_pta_fc	-0.043. (0.022)
m4.6_fc_dft_gi	ipr_general_sum_fc	0. (0)
m4.7_df_si	ipr_specific_sum	-0.097** (0.033)
m4.7_df_ti	ipr_tripsplus_per_pta	-0.038* (0.014)
m4.7_fc_df_si	ipr_specific_sum_fc	-0.126** (0.042)
m4.7_fc_df_ti	ipr_tripsplus_per_pta_fc	-0.048** (0.016)
m4.8_df5l_gi	ipr_general_sum	-95054. (47007)
m4.8_fc_df10l_ti	ipr_tripsplus_per_pta_fc	350630. (198472)
m4.10_df_gi	ipr_general_sum	-0.786* (0.383)
m4.10_df3l_gi	ipr_general_sum	-9140* (3803)
m4.10_fc_df_gi	ipr_general_sum_fc	-1.08* (0.505)
m4.11_df5l_gi	ipr_general_sum	-229964* (97364)
m4.12_df_si	ipr_specific_sum	-0.101* (0.04)
m4.12_df_ti	ipr_tripsplus_per_pta	-0.04* (0.017)
m4.12_df10l_gi	ipr_general_sum	0. (0)
m4.12_fc_df_si	ipr_specific_sum_fc	-0.129* (0.051)
m4.12_fc_df_ti	ipr_tripsplus_per_pta_fc	-0.05* (0.02)
m5.1_df_gi	ipr_general_sum	0.019*** (0.005)
m5.1_df3l_gi	ipr_general_sum	0.038*** (0.01)
m5.1_df5l_gi	ipr_general_sum	0.049** (0.016)
m5.1_df5l_si	ipr_specific_sum	-0.08. (0.047)
m5.1_df5l_ti	ipr_tripsplus_per_pta	-0.041. (0.023)

LIC Model	Significant IPR Indexes	Estimates (Std. Error)
m5.1_dft_gi	ipr_general_sum	0.021*** (0.005)
m5.1_dft_si	ipr_specific_sum	0.025. (0.013)
m5.1_dft_ti	ipr_tripsplus_per_pta	0.011. (0.006)
m5.1_fc_df_gi	ipr_general_sum_fc	0.032*** (0.005)
m5.1_fc_df3l_gi	ipr_general_sum_fc	0.066*** (0.012)
m5.1_fc_df5l_gi	ipr_general_sum_fc	0.089*** (0.02)
m5.1_fc_dft_gi	ipr_general_sum_fc	0.035*** (0.006)
m5.1_fc_dft_si	ipr_specific_sum_fc	0.042** (0.016)
m5.1_fc_dft_ti	ipr_tripsplus_per_pta_fc	0.017* (0.007)
m5.2_df_gi	ipr_general_sum	0.018*** (0.004)
m5.2_df3l_gi	ipr_general_sum	0.034*** (0.008)
m5.2_df5l_gi	ipr_general_sum	0.042*** (0.012)
m5.2_dft_gi	ipr_general_sum	0.02*** (0.004)
m5.2_dft_si	ipr_specific_sum	0.026* (0.012)
m5.2_dft_ti	ipr_tripsplus_per_pta	0.012* (0.006)
m5.2_fc_df_gi	ipr_general_sum_fc	0.028*** (0.005)
m5.2_fc_df3l_gi	ipr_general_sum_fc	0.055*** (0.01)
m5.2_fc_df5l_gi	ipr_general_sum_fc	0.07*** (0.015)
m5.2_fc_dft_gi	ipr_general_sum_fc	0.031*** (0.005)
m5.2_fc_dft_si	ipr_specific_sum_fc	0.04** (0.014)
m5.2_fc_dft_ti	ipr_tripsplus_per_pta_fc	0.016* (0.007)
m5.3_df10l_si	ipr_specific_sum	1.745. (0.91)
m5.3_df10l_ti	ipr_tripsplus_per_pta	0.882* (0.4)
m5.3_fc_df_si	ipr_specific_sum_fc	1.4. (0.791)
m5.3_fc_df5l_gi	ipr_general_sum_fc	0.847. (0.463)

LIC Model	Significant IPR Indexes	Estimates (Std. Error)
m5.3_fc_dft_si	ipr_specific_sum_fc	1.386. (0.791)
m5.4_df5l_gi	ipr_general_sum	-0.679* (0.264)
m5.4_df10l_gi	ipr_general_sum	0.573. (0.303)

Significance codes: *** p<0, ** p<0.001, * p<0.01, . p<0.05