Preferentialism and the Conditionality of Trade Agreements. An Application of the Gravity Model.

by

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Affidavit

"I declare that, except where explicit reference is made to the contribution of others, this dissertation is the result of my own work and has not been submitted for any other degree at the University of Glasgow or any other institution."

Printed Name: Michael Renfrew

Signature:

Dedication

For Dan.

For surely this would have remained proudly unopened atop your bookshelf.

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Abstract

Modern economic growth is driven by international trade, and the preferential trade agreement constitutes the primary fit-for-purpose mechanism of choice for establishing, facilitating, and governing its flows. However, too little attention has been afforded to the differences in content and conditionality associated with different trade agreements. This has led to an under-considered mischaracterisation of the design-flow relationship. Similarly, while the relationship between trade facilitation and trade is clear, the way trade facilitation affects other areas of economic activity, with respect to preferential trade agreements, has received considerably less attention. Particularly, in light of an increasingly globalised and interdependent trading system, the interplay between trade facilitation and foreign direct investment is of particular importance.

Accordingly, this thesis explores the bilateral trade and investment effects of specific conditionality sets, as established within Preferential Trade Agreements (PTAs).

Chapter one utilises recent content condition-indexes for depth, flexibility, and constraints on flexibility, established by Dür et al. (2014) and Baccini et al. (2015), within a gravity framework to estimate the average treatment effect of trade agreement characteristics across bilateral trade relationships in the Association of Southeast Asian Nations (ASEAN) from 1948-2015. This chapter finds that the composition of a given ASEAN trade agreement's characteristic set has significantly determined the concomitant bilateral trade flows. Conditions determining the classification of a trade agreements depth are positively associated with an increase to bilateral trade; hereby representing the furthered removal of trade barriers and frictions as facilitated by deeper trade agreements. Flexibility conditions, and constraint on flexibility conditions, are also identified as significant determiners for a given trade agreement's treatment effect of subsequent bilateral trade flows. Given the political nature of their inclusion (i.e., the appropriate address to short term domestic discontent) this influence is negative as regards trade flows. These results highlight the longer implementation and time frame requirements for trade impediments to be removed in a market with higher domestic uncertainty.

Chapter two explores the incorporation of non-trade issue (NTI) conditions in PTAs. Such conditions are increasing both at the intensive and extensive margins. There is a concern from developing nations that this growth of NTI inclusions serves as a way for high-income (HI) nations to dictate the trade agenda, such that developing nations are subject to 'principled protectionism'. There is evidence that NTI provisions are partly driven by protectionist motives but the effect on trade flows remains largely undiscussed. Utilising the Gravity Model for trade, I test Lechner's (2016) comprehensive NTI dataset for 202 bilateral country pairs across a 32-year timeframe and find that, on average, NTIs are associated with an increase to bilateral

trade. Primarily this boost can be associated with the market access that a PTA utilising NTIs facilitates. In addition, these results are aligned theoretically with the discussions on market harmonisation, shared values, and the erosion of artificial production advantages. Instead of inhibiting trade through burdensome cost, NTIs are acting to support a more stable production and trading environment, motivated by enhanced market access. Employing a novel classification to capture the power supremacy associated with shaping NTIs, this chapter highlights that the positive impact of NTIs is largely driven by the relationship between HI nations and middle-to-low-income (MTLI) counterparts.

Chapter Three employs the gravity model, theoretically augmented for foreign direct investment (FDI), to estimate the effects of trade facilitation conditions utilising indexes established by Neufeld (2014) and the bilateral FDI data curated by UNCTAD (2014). The resultant dataset covers 104 countries, covering a period of 12 years (2001–2012), containing 23,640 observations. The results highlight the bilateral-FDI enhancing effects of trade facilitation conditions in the ASEAN context, aligning itself with the theoretical branch of FDI-PTA literature that has outlined how the ratification of a trade agreement results in increased and positive economic prospect between partners (Medvedev, 2012) resulting from the interrelation between trade and investment as set within an improving regulatory environment. The results align with the expectation that an enhanced trade facilitation landscape (one in which such formalities, procedures, information, and expectations around trade facilitation are conditioned for) is expected to incentivise and attract FDI.

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Abbreviations

ADB	Asian Development Bank
AFTA	ASEAN Free Trade Area
ASEAN	Association of Southeast Asian Nations
ASEAN6	Brunei, Indonesia, Malaysia, the Philippines, Vietnam, and Singapore
CLMV	Cambodia, Lao PDR, Myanmar, and Vietnam
CM	Common Market
COMLANG_OFF	Official National Common Language
CONT	Contiguity
CPR	Civil and Political Rights
CU	Customs Union
DESTA	Design of Trade Agreements
DIST	Distance
DOTS	Direction of Trade Statistics
EIA	Economic Integration Agreement
EFTA	European Free Trade Area
EP	Environmental Protection
ESR	Economic and Social Rights
EU	European Union
FE	Fixed Effects
FDI	Foreign Direct Investment
FTA	Free Trade Area
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GM	Gravity Model
GSP	General System of Preferences
GVC	Global Value Chain
HI	High-Income
HRA	Human Rights Agreement
ILO	International Labour Organization
IMF	International Monetary Fund
IPR	Intellectual Property Rights
LTA	Latent Trait Analysis

MFN	Most Favoured Nation
MTLI	Middle-to-low-Income
NAFTA	North American Free Trade Area
NTI	Non-Trade Issue
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squared
PH	Porter Hypothesis
PHH	Pollution Haven Hypothesis
PPML	Poisson Pseudo-Maximum Likelihood
PSA	Partial Scope Agreement
PTA	Preferential Trade Agreement
PWC	PricewaterhouseCoopers
RTA	Regional Trade Agreement
SPS	Sanitary and Phytosanitary Measures
TBT	Technical-Barriers-to-Trade
TFA	Trade Facilitation Agreement
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
WB	World Bank
WTO	World Trade Organization

Introduction

Economic growth and development are increasingly driven by international trade and foreign direct investment (FDI), whereby recent decades of globalisation have ushered in a network of international production chains. As outlined by Mouriaux (2017), through this period beginning in the early 1990s, globalisation has overseen, and grown alongside, the increasing liberalisation of trade, the proliferation of information and communication technologies, and a reduction in transport costs.

Regarding the former, contemporary trade liberalisation is rooted in the ratification of the General Agreements on Tariffs and Trade (1947) and the Marrakesh Agreement establishing of the World Trade Organization (WTO) (1995). By way of prime mandate, the WTO seeks to promote trade openness between its 164 members such that trade may flow as freely as possible (WTO, 2021). As the number of nations engaging in international trade grew in the post-war era (Terborgh, 2003), the global rules outlined in the multilateral trading system, as promoted by the World Trade Organisation (WTO), offered an initial framework by which to conduct international exchange (Lumina, 2006). However, in the face of a failed round of negotiations in Doha in 2007, the Preferential Trade Agreement (PTA) has emerged as the modern mechanism of choice for establishing, facilitating, and governing trade and investment flows.

There are currently 349 WTO-Ratified PTAs in force globally[1], shaping the principles of international trade and as of 2017, 50 percent of global bilateral trade was taking place under some form of PTA arrangement (UNCTAD, 2019). On average the adoption of a PTA increases bilateral trade by almost 40 percent (Head and Mayer, 2014).

There are multiple motives and factors that underpin the decision-making process behind a specific PTA; however, broadly speaking, they can be categorised as either economic or strategic (Manger, 2009), whilst their impact reaches beyond economic determination and into a variety of social and political phenomenon such as human rights and conflict dispute (Rickard and Kono, 2014). Such myriad reasonings for adoption have necessarily resulted in wide and varied PTA profiles around the globe.

Despite their acknowledged importance in the global trade literature, surprisingly few studies have focused on the determining characteristics and design of PTAs. This has resulted in the common empirical mistreatment of PTAs as homogenous contracts equal in purpose and effect.

[1] As of June 2021.

There has, however, been a nascent emergence of literature seeking to rectify this mischaracterisation. Of particularly importance to this thesis are the works of Dür et al. (2014) [depth characteristics], Baccini et al. (2015) [flexibility characteristics], Neufeld (2014) [trade facilitation characteristics], and Lechner (2016) [non-trade inclusion characteristics]. These bodies of work support a deeper understanding of the design characteristic differences between PTAs and provide crucial measures by which to empirically test the associated effects on trade and investment flows.

Accordingly, this thesis employs several classifications of PTA condition categories -- depth, flexibility, non-trade, inclusions, and trade facilitation conditions -- to contribute towards the literature understanding on PTA design and bilateral trade and investment relationships.

The empirical methodology employed to suitably undertake this study is the gravity model: utilising both trade and investment forms of the model. It is recognised to be the workhorse of empirical trade modelling and has demonstrated a remarkably close fit to real trends. At its core, the gravity model is an initiative modelling of bilateral trade relationships, principled upon Newton's Law of Universal Gravity (Shepherd, 2016). Considered to deliver one of the most robust empirical findings in economics, bilateral trade between two countries is proportional to size, measured by GDP, and inversely proportional to the distance between them (Chaney, 2013). From the FDI-specific literature on the subject, the gravity model is an equally suitable methodology for estimating the relative importance of competing factors (Blonigen, 2005).

In the cases of conditionality governing depth, flexibility, and trade facilitation, the literature has begun to provide insights and analysis for global, regional, and national cases. In recognition of this, and in order to ensure a suitable contribution to the literature, the analysis is conducted for the Association of Southeast Asian Nations (ASEAN). It has for many years been considered the "most durable and successful regional grouping in the developing world" (Hill and Menon, 2010), and is of strategic importance in the trade agreement discussion. This is owed to the recognition that one of the driving forces in the development and growth within the ASEAN region has been the development of PTAs. Cumulatively, ASEAN nations -- Cambodia, Laos, Thailand, Myanmar, Viet Nam, Malaysia, Singapore, Indonesia, Philippines, and Brunei -- have 54 PTA's currently in force, and a further 8 early announcements in place with the WTO. Of note, the region has agreement with global economic powerhouses including China, India and Japan, and agreements at national levels with the United States of America and the European Union.

In this thesis, three chapters work to explore the roles and outcomes of the aforementioned conditionality groupings around bilateral trade and investment relationships.

Chapter One, *Measuring the Influence of Depth and Flexibility in ASEAN Trade Agreement Design* utilises recent content condition-indexes for depth, flexibility, and constraints on flexibility, established by Dür et al. (2014) and Baccini et al. (2015), within a gravity framework in order to estimate the average treatment effect of trade agreement characteristics across bilateral trade relationships in the ASEAN from 1948-2015.

Chapter Two, *The Effect of Non-Trade Inclusions on Bilateral Trade Flows*, explores how non-trade inclusions (NTI) contained in PTAs affect bilateral trade flows. Employing the Gravity Model for trade, I test Lechner's (2016) comprehensive NTI dataset to identify whether the empirics bare evidence to accusations of principled protectionism. This concern has emerged from a perception that high-income (HI) nations dictate the trade agenda through burdensome imposition of environment, labour, and civil-society regulation.

Finally, Chapter Three, *Foreign Direct Investment and Trade Facilitation Under Preferential Trade Agreements. The ASEAN Experience*, examines the interplay between trade facilitation conditions, as contained within PTAs, on ASEAN bilateral FDI flows. In order to do so, I use trade facilitation indexes developed in the work of Neufeld (2014) and employ a theoretically suitable Gravity Model for FDI.

The discussion and results of this thesis contribute to the growing literature focused on the importance of understanding the design architecture of trade agreements and enhanced trade environments, towards trade and investment outcomes.

1. Measuring the Impact of Trade Agreement Architecture in the ASEAN.

1.1. Introduction

Economic growth is driven by international trade (Myers, 2016) and the Preferential Trade Agreement (PTA) constitutes the modern mechanism of choice for establishing, facilitating, and governing its flows. On average, the adoption of a given PTA engenders a boost to bilateral trade of around 39 percent (Head and Mayer, 2014). Despite their acknowledged importance in the global trade literature, surprisingly few studies have focused on the determining characteristics and design of PTAs. This has resulted in the common empirical mistreatment of PTAs as homogenous contracts equal in purpose and effect. In order to dismiss this pervasive falsehood, the recent work of Dür et al. (2014) establishes a new methodological classification of PTAs based on their contained provisions. This new measure, capturing agreement depth, is complimented by partner research[2] undertaken by Baccini et al. (2015) to explore the relationship between the depth of a given agreement and its flexibility provisions[3]. The resulting agreement characteristic indexes provide a necessarily sufficient means of classification to estimate the effect of a given trade agreement based on its inherent criteria: hereby addressing the issue of mischaracterisation and providing this chapter with its base dependent variables.

As of June 2021, there were 349 WTO ratified PTAs in force globally[4] (WT0, 2021), shaping the principles of international trade for every WTO member nation[5] in the world: including the global economic and political powerhouses of the European Union (EU), ASEAN, and the three-nation[6] membership of the North American Free Trade Area (NAFTA). As the number of nations engaging in international trade grew in the post-war era (Terborgh, 2003), the global rules outlined in the multilateral trading system, as promoted by the WTO, offered an initial framework by which to conduct international exchange (Lumina, 2006). Whilst the embedded ideals of transparency, free trade, and fairness[7] continue to underline

[2] Both bodies of work are commissioned under the Design of Trade Agreements (DESTA) research group.

[3] The conditions and provisions that govern the commitment horizon, such that a signatory may address domestic requirements without falling in strict breach of the agreement.

[4] This figure encompasses the 565 separate notifications from WTO members for goods, services, and accessions.

[5] All WTO member nations following the ratification of the Mongolia-Japan PTA in June 2016 (WTO, 2016).

[6] Canada, Mexico, and the United States.

[7] Contained in policies such as most-favoured-nation (MFN), and national treatment, promotion of fair competition and the encouragement of economic development and reform (WTO, 2018).

international trade (ADB, 2008), the mantle of determination has shifted towards PTAs. Exploding in prominence at the beginning of the 21st century[8], PTAs continue to offer a partner-driven template for establishing trade in line with individual and time-contextual requirements.

There are numerous theorised drivers that underpin the decision-making process behind a specific PTA; however, broadly speaking, they can be categorised as either economic or strategic (Manger, 2009), while their impact reaches beyond economic determination and into a variety of social and political phenomenon such as human rights, conflict dispute, and public procurement (Rickard and Kono, 2014). Such myriad reasonings for adoption have necessarily resulted in wide and varied PTA profiles around the globe. For example, the EU utilises many institutionally pegged trade agreements and associated criteria to regulate and promote substantial trade and integration; whereas Sub-Saharan African nations typically employ largely templated agreements where the primary focus is the reduction of tariffs (Dür et al. 2014). It is no leap of logic that suggests that the characteristic profile of a given PTA will have deterministic standing over the resultant trade flows.

One region that has adopted a notably large number of PTAs is Southeast Asia. This is largely associated with the trade ambitions of ASEAN, and its rapid adoption of formalised agreements predominantly kickstarted during the 1990's[9], after the formalisation of the ASEAN Free Trade Area (AFTA).

Established as a security and peace promotion collective with principled economic ambition in the 1960's, ASEAN is now considered the most durable and successful regional grouping in the developing world (Hill and Menon, 2012). With the world's third largest consumer market, and fourth largest global economy (PWC, 2018), the utilisation of PTAs has served to underpin global trade ambitions that match regional requirements for industry protection, domestic stability, and cooperation. The design of each trade agreement is therefore expected to differ with respect to trade partner intentions and features, and subsequently influence bilateral trade flows in different manners. Given its growing global importance, and utilisation of PTAs, ASEAN offers a suitable and necessary testing sample to illustrate the importance of agreement design.

Following over 50 years of empirical development, this chapter will employ the workhorse of global trade characteristic measurements, the gravity model. First proposed by Jan Tinbergen in 1962, the gravity model for trade was inspired by the log-linear form of Newton's 1687 Law of Universal Gravitation, whereby

[8] See Figure 2 in Section 2. PTA Literature Overview.

[9] See Figure 9, Section 3. ASEAN PTAs.

trade flows are proportional with respect to partner nations economic 'mass' (generally proxied for by gross domestic product (GDP)) and are inversely proportional to the distance between them (wherein distance is a proxy for trade costs). Subsequent developments have introduced structural foundations that facilitate empirically robust determination of relative trade barrier and policy variables (Shepherd, 2016): for example, the presence of a common border, or the introduction of a common currency. The validity of the methodology allows one to estimate the importance of trade policy characteristic's utilising the data on all available bilateral trade flows across a given period. Resultantly, one can build an informed picture of the influence of agreement design on ASEAN bilateral trade flows, garnering contextually contingent predictive power that may inform future ratified agreements.

Accordingly, this chapter will employ the condition-indexes established by Dür et al. (2014) and Baccini et al. (2015) within a gravity framework in order to estimate the average treatment effect of trade agreement characteristics on bilateral trade flows for the ASEAN nations from 1948-2015. It will provide an overview of the ASEAN-experience as concerns the adoption of PTAs.

The rest of the chapter is set out accordingly. Section 1.2 establishes the importance of preferential trade agreements in line with their historical establishment and subsequent growth in both global coverage and design scope. The section continues with an overview of the traditional methodological measurement approach, before covering the recent introductions of in-depth characteristic classifications in the literature by research teams at the WTO and the Design of Trade Agreements (DESTA) project. DESTA is subsequently discussed in more detail as the database of choice for this chapter, alongside its contributions to the literature: specifically, the development of the indexes employed in the empirical methodology. Section 1.3 reviews the growing importance of the ASEAN region and its current and historical utilisation of PTAs as a means of ratifying gradually determined commitments. The region provides the global sample by which to test characteristic indexes against. In section 1.4 the gravity model is discussed in greater detail: beginning with its intuitive beginnings and moving towards its robust structural model as determined by address of recent literature recommendations. Section 1.5 contains the description and subsequent results of this chapter's estimations. Each index is measured against six different empirical forms to determine reliable estimate insights on the effect of trade agreement characteristics on bilateral trade flows. The chapter concludes in section 1.6 with discussion of the main identifications of the chapter. These are established by the results of empirical testing and their relationship to theoretical expectation.

1.2. Literature Review. Preferential Trade Agreements.

Preferential Trade Agreements[10] continue to rise in importance throughout the global trade landscape. There are currently 349 PTAs[11] in force globally, with a further 36 early announcements under negotiation. All 159 WTO member nations now have at least one PTA in force[12]. Beyond prevalence, PTA's boast big gains for bilateral trade, where the average agreement is associated with an increase in trade of at least 39 percent[13]. The specific drivers of such an increase vary between agreements. The determination of treatment outcomes is derived from a cocktail of global and national features which work in line with the trade agreements specific characteristics.

The political-economy literature has offered numerous explanations for why nations engage in the formation of PTAs. Broadly speaking they fall between two categories: economic or strategic. The former classifies agreements as a tool that facilitates growth through market competition, industry development, and access to inputs (Baldwin, 1993; Chase, 2003; Manger, 2009); whilst the latter stresses the role of trade agreements as a political tool to promote soft-power[14] characteristics such as democratisation, whilst engendering commitment to specific behind-the-border policy changes, and actively attracting investment (Mansfield and Reinhardt, 2003; Maggi and Rodriguez-Clare, 2007; Mansfield and Milner, 2012).

This enhanced understanding of formation drivers made way for a focus on the effects of PTAs. Not restricted to the primary concern of economic trade flow outcomes (Baier and Bergstrand, 2007), researchers have considered the impact of agreements on a variety of political and social phenomena. These include market volatility, domestic reforms, behind-the-border protectionism, human rights, and conflict dispute (Hafner-Burton, 2005; Rickard and Kono, 2014).
The ample supply of formation and outcome explanations is a helpful step towards a grounded understanding of the multiplicative roles and subsequent effects of trade agreements in the global economic system. However, the literature has mostly focused on characteristics in external relation to the

[10] Also referred to as Regional Trade Agreements (RTAs) (WTO, 2018), this chapter adopts the former terminology to represent the growing global utilisation of trade agreements beyond regional groupings.

[11] As notified to the WTO (2021).

[12] Following the notification of a PTA between Mongolia and Japan in 2016 (WTO, 2018).

[13] The mean coefficient of structural gravity modelling (Head and Mayer, 2014).

[14] Following the classification of Nye (1990) wherein cultural attraction, ideology, and international institutions work to develop international relations in a cooperative manner.

agreements[15], and resultantly "suffers from a lack of data on the design" (Baccini et al., 2015). Some work has indeed controlled for differences in relation to levels of trade integration (Magee, 2008), yet few studies focus on selected design and functional differences[16].

Agreement characteristics have been typically subsumed in the coefficient of a dummy proxy which tells nothing of individual design differences or underlying ambitions. This dichotomous treatment inadvertently mischaracterises all agreements as if they "are equal in both purpose and effect" (Baccini et al., 2015). This matters greatly if one is to ascertain a deeper understanding of contextual suitability in the utilisation of trade agreements, as related to the key drivers and provisions contained within. It is not merely enough to know their outcomes; we must understand their drivers.

The relative treatment effect of a given PTA on trade is predicated on two governing and mutually reinforcing features, country characteristics and agreement characteristics (Vicard, 2011). As noted by Hofmann et al. (2017), the lack of systematic information on the growing contents of PTAs works to limit the possibility of meaningful insight. Whilst it is possible to discern the average impact of a PTA, one cannot use rudimentary proxies to delve deeper into the key drivers.

The inadequate consideration afforded to design differences is a concern given that PTAs are agreed to vary with respect to purpose and ambition. This is clearly reflected in the depth discrepancies of contained conditions, concessions, and flexibility clauses. The particular design of a PTA is a reflection of the contextual commitment between signatories as governed and constrained by competing political, economic and social requirements and intentions. Whilst early agreements predominantly focused on straightforward tariff procedures[17] they have steadily deepened in scope; now legislating for a number of behind the border (BTB) trade characteristics from investment and domestic competition policy to environment and intellectual property (Baccini et al., 2015; Hofmann et al. 2017; Laget et al., 2018).

The logic proposes that the outcomes[18] associated with a given PTA will differ with respect to an agreement's conditions and provisions: such that the signing of a deep agreement will engender different outcomes to those associated with the signing of a shallow one. For example, committing to the

[15] Either as directly observable country traits, such as economic size and geographical proximity, or with respect to an agreements political ambition: see Balassa's (1961) integration classifications.

[16] Some exceptions Smith, 2000; Hafner-Burton, 2005; Hicks and Kim, 2012; Kucik, 2012.

[17] See Dür et al. (2014)

[18] Outcomes will differ with respect to the question at hand, but may include trade values, investment (FDI) flows or migration patterns.

incorporation of several BTB regulatory conditions will likely entail greater costs to domestic businesses than would have existed in their absence. Design differences therefore matter considerably in the determination of relative treatment effects. Incorporating them within the empirical modelling undertaken in this chapter will ensure a deeper and more nuanced understanding of both formation and outcome justifications and effects. Accordingly, and in line with the above-outlined theory, this chapter's first hypothesis is as follows:

H_1: The average treatment effect of PTAs on bilateral trade flows is significantly determined by the composition of its conditional architecture.

This chapter subsequently builds upon recent developments in the literature by providing a deeper understanding of the roll of principal design characteristics on trade flows: specifically, depth of an agreement, flexibility of condition adoption, and criteria that govern the acceptable use of a flexibility condition.

1.2.1. The Development of Modern Trade Agreements

The adoption of PTAs has increased dramatically since 1948[19]. The process governing modern PTAs was formalised in the policy terms of the General Agreement on Tariffs and Trade (GATT) Article XXIV, as an exemption to the core WTO principle of non-discrimination among trading partners (WTO, 2018). At their most basic, modern PTAs represent the codified agreement of reciprocal trade arrangements between two or more partners, wherein member countries commit to cut their tariffs and undertake additional obligations in policy areas covered by the WTO such as customs administration or contingent protection (Laget et al., 2018).

Whilst the applied terminology and adaptable contents are by and large a product of the last 70 years, there is nothing new about the formalisation of trading relationships through ratified arrangements. Empires provided the earliest source of ensuring trade interests through "*spheres…that gave their traders and manufacturers secure access to foreign markets,"* (WTO, 2011). Whilst bilateral treaties have existed for centuries, the prevailing view that international agreements could secure trade agreements only began in the late 18th century (Howse and Trebilcock, 1996). Early agreements were more concerned with merchant protection, as opposed to new market access and liberalisation.

[19] There has been a total of 669 RTAs notified to the WTO (WTO, 2018).

The modern PTA was born out of post-war efforts to rebuild the global trading system (Brown, 2003). In the immediacy of the post-war years the foundations for the modern multilateral trading system were established. The United States emerged as the dominant economic superpower who, along with Britain, wanted to construct an international system that would prevent a return to the financial instability and trade bloc rivalry that had led to the outbreak of the war (Brown, 2003). This period saw the formation of the International Monetary Fund (IMF), the World Bank (WB), and the steady adoption of GATT provisions that would provide the foundation for an expanding multilateral trade system until it was subsumed by the WTO in 1995.

PTAs are classified by the WTO in four ways relative to their scope. Table 1.1 contains each recognised form and its associated definition. Prior to recent developments, the majority of research concerning associated differences in trade flow owed to PTA form utilised such classifications. PTA characteristics were, at best, considered along the political-economy lines first drawn out by Balassa (1961) with regards to economic integration. Whilst a useful classification for providing an intuitive understanding of an agreements scope, such classifications consistently fail to account for design differences between and within groupings. For example, a given Free Trade Agreement (FTA) may go further in intellectual property protection than a given customs union (CU); despite the expectation that the associated deepening of integration from a CU would entail deeper conditions across all commitments than would be expected for an FTA.

Table 1.1: Trade Agreement Classifications

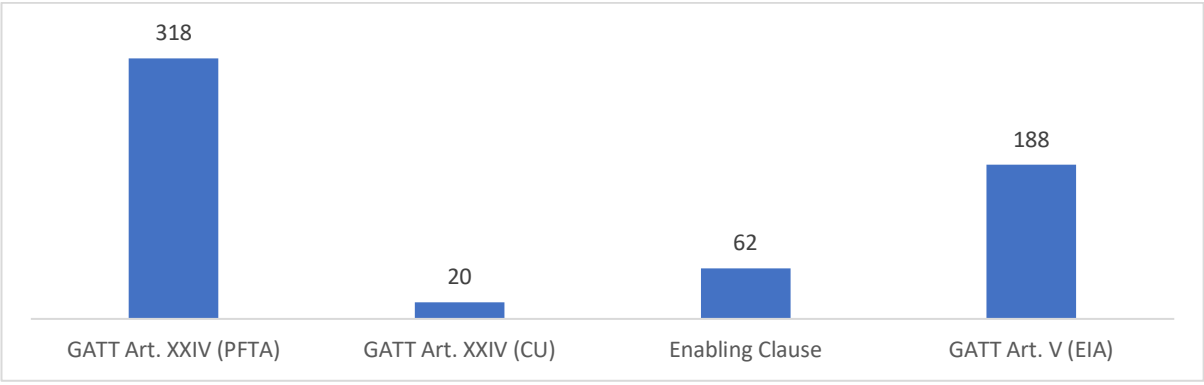
Classification	**Definition**
Free Trade Agreement (FTA)	As defined in paragraph 8(b) of Article XXIV of GATT 1994; *"A free-trade area shall be understood to mean a group of two or more customs territories in which the duties and other restrictive regulations of commerce (except, where necessary, those permitted under Articles XI, XII, XIII, XIV, XV and XX) are eliminated on substantially all the trade between the constituent territories in products originating in such territories."*
Customs Union (CU)	As defined in paragraph 8(a) of Article XXIV of GATT 1994; *"A customs union shall be understood to mean the substitution of a single customs territory for two or more customs territories, so that: (i) duties and other restrictive regulations of commerce (except, where necessary, those permitted under Articles XI, XII, XIII, XIV, XV and XX) are eliminated with respect to substantially all the trade between the constituent territories of the union or at least with respect to substantially all the trade in products originating in such territories, and (ii) subject to the provisions of paragraph 9, substantially the same duties and other regulations of commerce are applied by each of the members of the union to the trade of territories not included in the union."*

Economic Integration Agreement (EIA)	as defined in Article V of GATS; *"This Agreement shall not prevent any of its Members from being a party to or entering into an agreement liberalising trade in services between or among the parties to such an agreement, provided that such an agreement: (a) has substantial sectoral coverage, and; (b) provides for the absence or elimination of substantially all discrimination, in the sense of Article XVII, between or among the parties, in the sectors covered under subparagraph (a), through: (i) elimination of existing discriminatory measures, and/or (ii) prohibition of new or more discriminatory measures, either at the entry into force of that agreement or on the basis of a reasonable time-frame, except for measures permitted under Articles XI, XII, XIV and XIV bis."*
Partial Scope Agreement (PSA)	PSAs are not directly defined or referred to in the WTO agreement. They cover only certain products and are notified under *paragraph 4(a) of the enabling clause*.

Source: Balassa (1961)

Noting the contents of Figure 1.1 we can identify that the majority of current PTAs are free trade agreements (FTAs) (318 in total). FTAs emerged as the primary form of PTAs in response to a need to go further and faster than the broader GATT system in order to manage deeper trade integration (Carpenter, 2009). Three major stages are considered pivotal to the emergence of this requirement and the resultant adoption. The first (1950's – 1960's) concerns Europe's push for continental integration. The second (1990's) is associated with advances in Europe's single market programme of deeper integration, as the United States opened itself to regionalism with the formation of NAFTA. The final, and most defining stage concerns the new millennium's global move towards bilateral, plurilateral and cross-regional initiatives, combined with the explosion of globalisation.

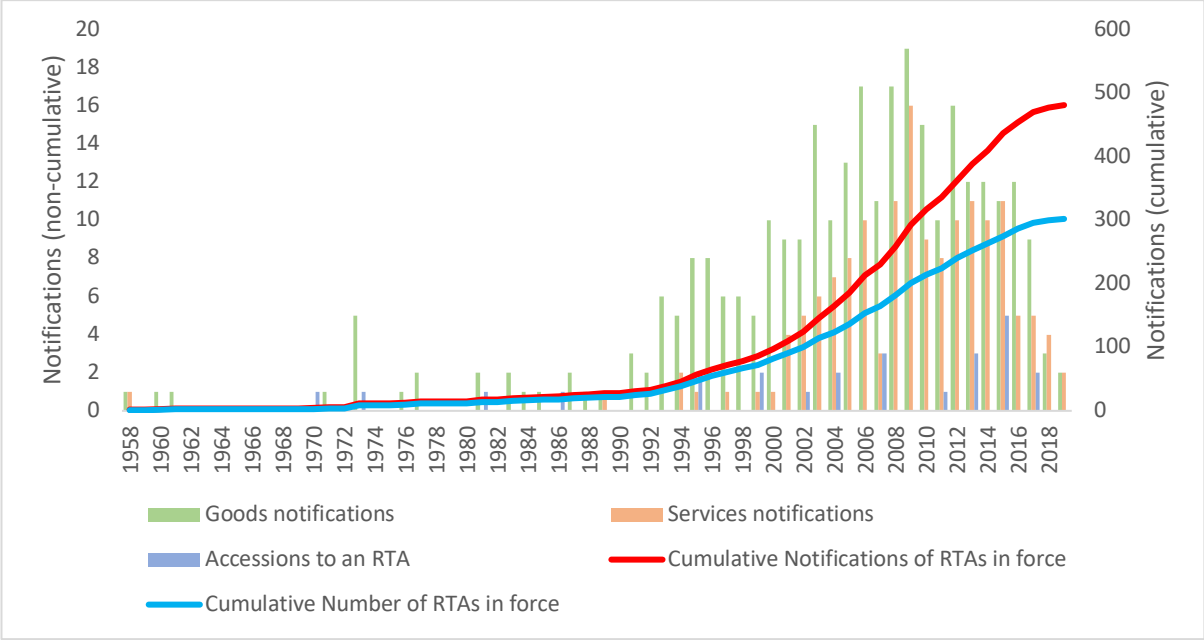
Figure 1.1: Ratified Trade Agreements by Classification



Source: WTO, 2021

Figure 1.2 displays the number of PTAs currently in force, by the year they entered into force (1948-2018). Notifications are three-fold with respect to content: goods, services, or accessions. As one can identify from the graph, the uptake was modest from 1948-1990 with only 28 agreements in force. Thereafter, we see an average annual uptake of over 15 PTAs per year (1991-2018). The upturn in PTA adoption is associated with two global trends of the time. Firstly, the end of the cold war married European ambitions for stabilised trade relations with the desire of leaders in the "new governments across east and central Europe who looked to learn from Western Europe's experience and join its institutions" (Wallace, 2017). Secondly, competition for market access dominated the 1990's with a marked "increase in private flows to emerging market countries" (IMF, 2003). These two trends have underpinned the distinction of PTAs as the crucial global economic mechanism for fostering cooperation, stability, and trade. Given the continued formulation, announcement, and adoption of new trade agreements[20], their importance is expected to sustain and proliferate. This demands greater understanding as to their determinants and outcomes.

Figure 1.2: PTAs in Force (by year of entry into force), 1958-2019



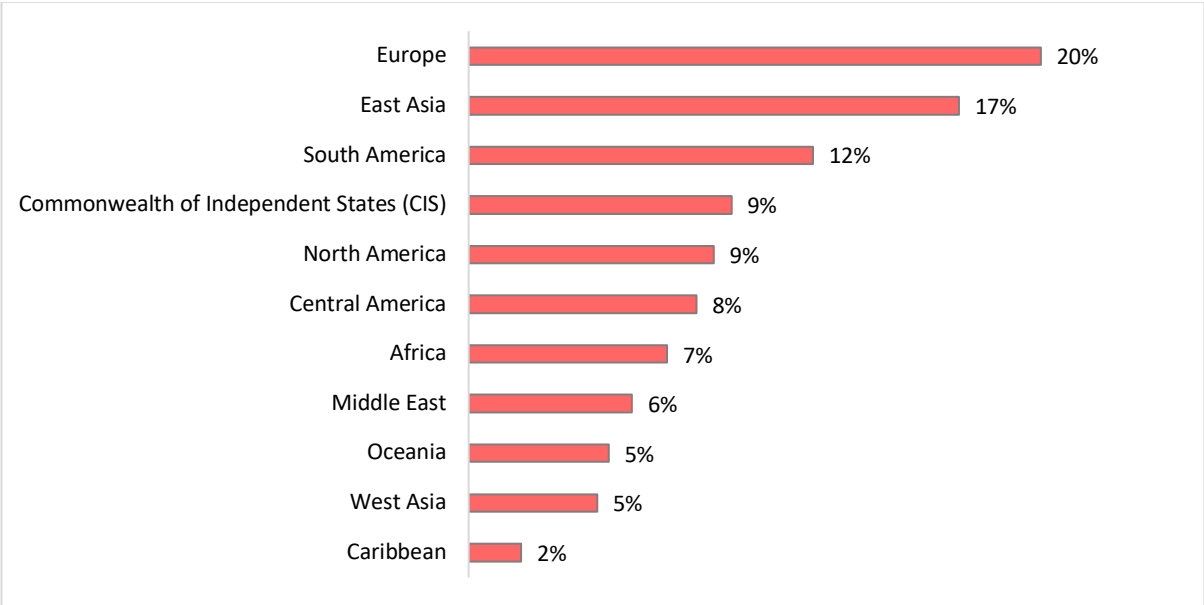
Source: WTO, 2019

As identified in Figure 1.3, by region, PTA activity remains strongest in Europe (20 percent of all PTAs in force), determined by successive European Union enlargements and agreements. From 1995 the EU has welcomed the accession of 16 new member countries from Scandinavia, Eastern Europe, and the Mediterranean. Europe is followed by East Asia (17 percent), South America (12 percent) and the Commonwealth of Independent States, and North America (both 9 percent). There are a further 36

[20] There are currently 39 PTA early-announcements in place (WTO, 2018).

agreements classified under the 'early announcement' category, of which 18 belong to either EFTA or the EU. As well as the largest number of agreements, EU countries also have the deepest agreements. This is attributed to the formation of the EU as a customs union area governed and regulated by a number of EU institutions that go well beyond trade matters. These deep commitments are also present in East Asia, particularly in agreements brokered by Japan and South Korea (Dür et al., 2015; Hofmann et al., 2017). European and Asian nations also boost the largest number of intra-regional PTA (41 and 45 respectively).

Figure 1.3: PTAs Breakdown by Area (%)



Source: WTO, 2021

One of the most crucial developments to be acknowledged as a result of PTAs is that of network connection. Hofmann et al. (2017) identified the dramatic change of country trading relationships; at the start of the 1990's trade was heavily fragmented in small regionally grouped clusters. The proliferation of PTAs, combined with the abovementioned forces of the time, over the next 25 years expanded the development of global trade relations towards an interconnected near-global 'spaghetti bowl' of larger, more integrated regional groupings. This trend conforms to theories of regional groupings in trade agreement signatories (Robertson, 2004), and the increasingly interconnected global production and market chains (Lee et al., 2012; De Backer and Miroudot, 2013).

The overview of PTAs serves to reinforce the reality of their importance upon the global trade landscape. Theoretically there is no shortage of explanation for their formation and associated outcome. However, until recently scant attention has been paid to variations across PTAs in terms of content and design (Dür et al., 2014). This is problematic when one considers the obvious difference in impact that will occur

between a bilateral deal entailing modest tariff cuts on an MFN basis and a multilateral commitment to engage in a customs union.

Recent work has attempted to further this understanding by differentiating between types of agreement[21]. Magee (2008) and Roy (2010) provide the best-known research, detailing the significant returns associated with customs unions, the modest returns of a free trade area, and negligible impact of partial-scope agreements. However, even within a specific categorisation there exists a large variation in provisions. If we consider tariff levels as an example, all else being equal one would expect a higher flow of trade to be associated with an FTA agreement containing lower tariffs, than one containing higher tariffs.

The development of a robust and systematic coding methodology makes it possible to appropriately build upon these earlier attempts to address the relative impact of PTAs with respect to their specific design and conditions[22]. The benefit of such enhanced categorisations lays in the ability for researchers to revisit the earliest of motivations in trade literature and ask an updated question: how does the design of a given PTA impact trade? Accordingly, two datasets have emerged to address the under-specification issue and shed new light on a crucial global contract.

The first major contribution to the enhanced PTA-classification literature was introduced by Horn, Mavroidis, and Sapir (2010). Concentrating on the coverage of 28 trade agreements (14 USA, 14 EU), the HMS methodology classified 52 agreement provisions and assessed their legal enforceability. These reoccurring policy areas are divided into those covered by the WTO (WTO+), and those outside its mandate (WTO-X (extra)). Legal enforceability is defined in circumstances where the language used is sufficiently clear, and the use of a dispute settlement has been included; or, at the very least, not excluded. The HMS methodology began thereafter to motivate further studies that either employed it directly or expanded upon it. Table 1.2 contains these studies. Despite its importance in the literature, the HMS approach for the collection, classification, and analysis of the content of PTAs is not the only one.

The Design of Trade Agreements Database (DESTA) developed by Dür et al. (2014) looks in more detail at the content and depth of specific provisions in PTAs for a large sample of over 606 trade agreements. Its extensive coverage is bolstered by an additional dataset covering flexibility characteristics and constraint on flexibility characteristics (Bacinni et al., 2015). The research organisations collective work has furthered the understanding of PTA scope and impact. Without reinventing the wheel, insights from previous studies

[21] The aforementioned Balassa classifications such as a free trade area and a CU.

[22] See also Haftel (2010), Kucik (2012), Mansfield and Milner (2012).

have been tested against the DESTA methodology. Within the catalogue of this body of work lay this chapter's motivation. Accordingly, the average treatment effect of depth and flexibility provisions on bilateral trade will be modelled using the ASEAN nations and their trading partners.

Table 1.2: Research Lead by the HMS Methodology

Kleimann (2014)	Used the HMS methodology partly as a basis to study the coverage and depth of the ASEAN agreement as well as of agreements concluded by individual ASEAN members with third countries. In addition, Kleimann (2014) also attempts to analyse the depth of some WTO+ provisions, i.e. to what extent the PTAs create rules that go beyond the WTO legal status quo.
Puig and Dalke (2016)	Apply the HMS methodology to analyse the legal enforceability of sanitary and phytosanitary measures (SPS) and technical barriers to trade (TBT) provisions in Canada's PTAs.
Kohl, Brakman and Garretsen (2016)	Focus on 13 WTO+ and 4 WTO-X provisions identified by HMS and expand the coverage of preferential trade agreements to 296.8 Despite some minor differences in the definition of legal enforceability, the coding strategies in HMS and Kohl at al. (2016) are compatible and provide quite similar results when comparing them across United States and EU PTAs.
Hofman et al. (2017)	Published in the World Trade Report 2011, they extended the dataset to 100 PTA's signed by 178 countries. This has since been expanded in the same group by Hofmann et al. (2017) to create the 'Horizontal Depth' dataset.

1.2.2. Depth, Flexibility, and Constraints on Flexibility

DESTA was pioneered by Dür et al. (2014) to be "the most sophisticated operationalization of the concept of depth agreements": both in its coverage of PTAs and in its coding of agreement characteristics. It provides classifications for 587 trade agreements, containing all WTO ratified agreements alongside a number of un-ratified south-south agreements[23]. Depth is coded across ten broad sectors of cooperation: market access, services, investments, IPR, competition, public procurement, standards, trade remedies, non-trade issues, and dispute settlement. Each sector has then been coded for over 100 data points in total.

Following the definition of Downs et al. (1996), depth concerns any extent to which an agreement requires states to depart from what they would have done in its absence. The dataset is currently the largest and most

[23] See Dür et al. (2014) for a description of the identification process and sources.

comprehensive with respect to items coded, and agreements included[24] (Dür et al., 2014). For robustness, Dür et al. (2014) employ two different measures of depth. The first is an additive index, *depth_index*.

As contained in Table 1.3 below, *depth_index* combines seven key provisions that can be included in PTAs that are theoretically determined to improve trade[25]. Dür et al. (2014) define a substantive provision as one for which there is a definitive article of change for which an outcome, objectives, or commitments have been set. For example, a national treatment clause in the services chapter. By comparison, a statement made wherein signatory parties declare a desire for change, without declaring specific targets and actions to achieve the change, does not count as substantive. Each PTA in the database is accordingly given a *depth_index* score based on the sum of included provisions from the seven. A deeper contract entails greater reductions in trade frictions: both at the border (quotas and tariffs) and behind the border (domestic regulatory changes). A deeper agreement is expected to engender larger gains to trade owed to increasing market harmonisation.

Table 1.3: Additive Index of Depth Provisions[26]

More than a partial scope agreement?
Substantive provision on services?
Substantive provision on investments?
Substantive provision on standards?
Substantive provision on public procurement?
Substantive provision on competition?
Substantive provision on intellectual property rights?

The second measure, *depth_rasch*, relies on latent trait analysis (LTA) and specific application of the Rasch model[27] to a total of 48 variables that are theoretically related to the depth of an agreement. These variables are classified across six behind-the-border agreement features: services, investments, intellectual property

[24] For example, the only regarded competition is the WTO horizontal depth database. Utilising the HMS methodology Hofmann et al. 2017 code for 52 items across 279 agreements.

[25] Theoretical justification can be found in Dür et al. (2014).

[26] The seven components that make up *depth_index* provide an enhanced classification for categorising the content of PTAs around depth of agreement. It is important to note, however, that as an additive index it is not reasonable to assume that each component is a perfect substitute for another. The theorised trade outcomes of a provision on services would be expected to differ from those associated with the provision of intellectual property rights.

[27] The Rasch model assumes that all items capture one underlying latent dimension, each with a different discriminatory power.

rights, public procurement, standards, and competition. The full breakdown can be found in Appendix A1, whilst further discussion on Latent Trait Analysis can be found in Appendix A2.

Utilising a Rasch model allows one to deal with highly correlated data (in this case agreement characteristics) and to account for the reality that not all provisions are equal in determining the extent of signatories' commitments; *"all items capture one underlying latent dimension, but with different discriminatory power"* (Dür et al. 2014). For example, a provision for the implementation of the GATT standards code is likely to facilitate greater bilateral trade than a review provision for the services provisions. Correspondingly, each provision is given a weighted value of importance and each PTA is assigned an overall Rasch score whereby a higher score represents a deeper agreement.

These new indexed characteristic classifications shine additional light on the trends discussed in the previous section. Much like the number of PTAs in force, their average depth remained stable until the 1990s, at which point it grew significantly. The 13 agreements with the highest depth score were all signed after 2000. Variation across PTAs has, however, remained large regardless of signing period.

Having established the indexes, Dür et al. (2014) employed the gravity model to test the hypothesis that deeper PTAs are associated with higher levels of bilateral trade between its signatories. Utilising data on all 587 coded agreements, their work established a conclusively positive relationship between the depth of a PTA and its resulting impact on bilateral trade flows. This result was mirrored in the work by Hofmann et al. (2017) that utilised their own Horizontal-depth classification. The implication herein is clear; depth of agreement is clearly deterministic. In accordance with these findings this chapter's second hypothesis is:

H_2: Deeper PTAs will be associated with larger bilateral trade flows for ASEAN nations and their trading partners.

However, on its own, a condition of depth is hard pressed to illuminate the full picture as it speaks nothing to the context in which it will find itself employed. PTAs therefore need to be considered in a slightly tangential manner. Trade agreements are as much a political tool as an economic one; after all, economic and strategic motivations are rarely exclusive. They have the power to signal and govern the direction, partnership, and stability of trade relationships, whilst simultaneously speaking to a long-term strategy for which the path cannot be precisely mapped. Accordingly, nations have been including large numbers of flexibility measures that allow members to react to changing domestic conditions (Koremenos et al., 2001; Helfer, 2013).

The logic for this was set out by Johns (2014), who argued that deep agreements will be more flexible, while shallow ones will be more rigid. Deeper agreements contain more conditions which necessarily implies a further divergence from their trajectory absent an agreement. Accordingly, a given nation will require flexibility in meeting the conditions of the agreement as they navigate domestic and global pressures, both economically and politically. Flexibility provisions legislate allowance for short-term demands that divert from particular agreement mandates; thus, allowing for long-term partnership to be built across many scopes. Flexibility provisions are therefore devices that "allow states to anticipate and respond to domestic contingencies…without violating the terms of an agreement" (Baccini et al., 2015).

In the realm of international institutions this sentiment has been echoed; deep agreements are likely to be more flexible than shallow agreements (Rosendorff and Miner, 2001; Kucik and Reinhardt, 2008). Baccini et al. (2015) believed the same was true for PTAs as it was for international cooperation[28]. This is predicated on the insight that agreements that contain a substantial number of commitments are also likely to feature additional flexibility measures to allow for temporary concession withdrawal by in-need signatories. Their assertion goes even further by proposing that increased flexibility will also be accompanied by the increased conditionality of their use; one would expect strings (hereafter referred to as constraints) to be attached to the use of a flexibility provision contained within a deep agreement.

Accordingly, an index is outlined for flexibility and applied to the same set of PTAs as used by Dür et al. (2014) for the depth indexes. Flexibility, denoted by Baccini et al. (2015) as *flex_escape*, is a measure of long-term flexibility provisions that can be used by signatories to protect against unforeseen developments, without falling in breach of the agreement. The additive index, contained in Table 1.4, ranges from zero to four; with a score of four associated with the most 'escape clauses'. In the absence of these provisions, a country that choses to suspend tariffs, for example, would be in breach of the agreement and open to sanction.

So why do flexibility conditions matter? The underpinning logic of PTAs is that states cooperate with each other in order to improve the foreign market access for their exporters (Dür, 2007; Elsig and Dupont, 2012). As governments strive to improve market access for exporters, domestic import-competitors would be expected to either oppose the agreements or demand sector protection. In order to respond to specific domestic pressures, PTAs can include a set of flexibility devices that are adaptive and responsive to future economic shocks. They are the "safety valves that allow temporal legal breach" (Kucik, 2012). This long-

[28]The associated reading has informed their determination of flexibility instruments to be operationalised for empirical testing: including, Goodman and Jinks (2004), Alvarez (2005), Neumayer (2007), Koremenos and Nau, (2010) and **??erb** and Pollack (2010).

term flexibility view consists of provisions such as balance of payments exception and specific safeguard provisions.

Table 1.4: Additive Index of Flexibility Provisions[29]

A provision allowing for the suspension of tariff cuts in case of balance of payments problems
A general safeguard provision
A provision allowing for the imposition of countervailing duties
A provision allowing for the imposition of anti-dumping duties

A flexibility provision is defined as "any provision of an international agreement that allows a country to suspend the concessions it previously negotiated without violating or abrogating the terms of the agreements*"* (Rosendorff and Milner, 2001). It is a means of addressing the concern that is the future costs of compliance (Fearon, 1998). This fear creates a time-inconsistency problem. However, if governments use these mechanisms without restraint, the benefits of market access will be nullified.

As a remedial measure to this potential occurrence, restriction conditions are attached to constrain their use to specific circumstances. These are known as rigidity conditions or flexibility constraints. An alternative to the long-term conditions are short term flexibility provisions that allow for domestic industries threatened by soon-to-be competition to prepare for liberalisation. These provisions are normally in the form of a negotiated transition period. The opportunity to necessarily postpone contractual obligations (absent of retaliation) is theorised to encourage deeper agreements that are sustained over time. This is the flexibility hypothesis.

Flexibility considerations owe themselves to the international-politics literature, which began to emphasise the behavioural aspects associated with the design of international agreements (Rosendorff and Milner, 2001). The theory outlines, in the case of domestic political pressure, a government's field calls to renegade on the terms of a given agreement. This 'time-inconsistency' issue sees that short-term pressures may mean that the costs of upholding international agreement conditions become impossible.

However, it is expected that the value of the benefits of cooperation may be positive over a significantly long-time horizon. As the magnitude of pressure varies over time, and the precise timings of payoff and

[29] The four components that make up *flex_escape* provide an enhanced classification for categorising the content of PTAs around the flexibility conditions within an agreement. It is important to note, however, that as an additive index it is not reasonable to assume that each component is a perfect substitute for another. The theorised trade outcomes of a safeguard provision would be expected to differ to those of a provision allowing for the imposition of anti-dumping duties.

political pain are unknown, there is a need to design agreements in such a way that temporary political urgencies do not unravel an entire relationship, thus begetting a retaliatory spiral. Flexibility provisions are the embedded policy characteristic of choice.

They are particularly necessary in the developing-nation context where the proper functioning of international institutions hinges on domestic institutional capacities (Busch et al., 2009). As political uncertainty is typically high and certain provisions may prove to be too contentious in the short term, as a result of lobbying, costs, or an inadequate institutional capacity. Whilst renegotiation is an option in circumstances where terms are broken, it is an arduous and costly process in terms of time, resources and participants.

The same is often not the case for developed regions. Where the uncertainty of future costs of compliance is low, the terms of agreement will accurately reflect anticipated future conditions. Even if flexibility provisions are constant across time and membership, not all members have the domestic institutional capacity to take advantage. By definition, "flexibility provisions are formalized by regime: the agreement sets out intricate standards for their acceptable use" (Baccini et al., 2015) Therefore, in multilateral circumstances, the efficient alternative to renegotiation is building formal flexibility provisions into the agreement from the start. The formality of such provisions accomplishes three ends:

1. It defines legal standards that can constrain the abuse of such provisions;
2. It legitimates the use of such provisions insofar as it meets those standards, which in turn can prevent excessive retaliation from other parties;
3. It provides a mechanism to assess, and limit demands on, the compensation due to the adversely affected parties.

The theoretical reasoning behind flexibility provisions yields several insights about state behaviour and the design of international agreements. Where there is no possibility of building flexibility provisions into an agreement, negotiating mutually acceptable terms would be more difficult, and therefore states should only be willing to make shallow commitments. Otherwise, states entering into a multilateral agreement under conditions of uncertainty should be likely to build flexibility provisions into the agreement. An international agreement with formal flexibility provisions should enjoy greater, more sustained levels of overall compliance, precisely because legal defections are possible when necessary.

As flexibility conditions increase, it is expected that the conditions governing their use will similarly increase. These constraints are intended to combat asymmetric information whereby a signatory may opt

to breach the contract because it is in their interests to do so; not because they need to. It is therefore sensible to include mechanisms to combat such opaqueness and ensure that flexibility conditions are employed when necessary. As shown by Baccini et al. (2015), as agreement flexibility increases so too do the number of constraints governing them.

This concept is captured by Baccini et al. (2015) as an index denoted *flex_rigid*; an additive index consisting of eight variables, contained in Table 1.5, that constrain the use of flexibility conditions. They work to constrain inappropriate use of acceptable contract-breach clauses, where a score of eight represents high rigidity, and a score of zero means low rigidity. *Flex_rigid* captures the governing procedure in place for the utilisation of flexibility clauses. This is different to *flex_escape* which captures the flexibility provisions themselves.

Table 1.5: Additive Index of Constraint of Flexibility Provisions[30]

A provision measuring whether parties agreed on GATT/WTO provisions on safeguards
A provision calling for a duration (and extension) of safeguard duty that is different from GATT/WTO
A provision allowing safeguard measures only during a transition period
A provision allowing safeguard measures on products up to the MFN duty or the temporal suspension of a duty reduction
a measure that controls for the scope and degree of the measure taken
A provision where parties agree on a de minimis dumping margin (or dumped volume) that differs from the GATT/WTO
A provision to determine a referee to GATT/WTO
A provision whether the parties develop a common policy on subsidies

In tandem, depth, flexibility, and constraint on flexibility conditions provide a mutually reinforcing partnership that speaks to the context of the adoption period and signatory conditions. How they work together will have distinct implications for how trade develops between the parties of the agreement. It is important to demarcate that, whilst they are often positively associated with each other (Baccini et al, 2015), depth, flexibility, and constraints on flexibility are distinct concepts that represent different agreement motivations, outcomes, and characteristics. Depth regards the level of commitment, whilst flexibility refers

[30] The eight components that make up *flex_rigid* provide an enhanced classification for categorising the content of PTAs around the conditions that constrain the use of flexibility conditions within an agreement. It is important to note, however, that as an additive index it is not reasonable to assume that each component is a perfect substitute for another. The theorised trade outcomes of a provision to determine a referee to GATT/WTO would be different to those associated with a provision to agree on the GATT/TWO provisions on safeguards.

to the mechanisms that allow for legal breach of contract. Constraints on flexibility are a third-order condition addressing asymmetric information and motivation.

Having determined indexes for both flexibility and constraints on flexibility, Baccini et al. (2015) tested the relationships with depth conditions. Many studies point to a positive correlation between depth and flexibility. A trade agreement's distributional effect depends on its depth. As discussed, deeper agreements have a greater positive trade flow effect than shallow ones. This also creates a scenario whereby the number of economic sectors that potentially experience negative effects from a PTA increases together with the depth of an agreement. Accordingly, domestic political pressure increases in tandem with the potential for industrial disruption as special interest groups seek to challenge the imminent threat. As political disruption threatens the long-term stability of the trade deal (subsequent leaders may not agree with the outlined terms and conditions), flexibility conditions increase. Such inclusions allow for the full adoption pathway to smooth out short term disruption.

Research into the concept identifies that deep agreements tend to be more flexible than shallow ones (Downs et al. 1996; Rosendorff and Milner, 2001; Kucik and Reinhardt, 2008). This pattern is theorised to hold for PTAs where "*deep commitments should also feature multiple flexibility measures that allow states to temporarily withdraw concessions*," (Baccini et al., 2015). Utilising their indexes and regressing them in a Tobit form, it is shown that: 1) the deeper a PTA, the more flexible it is; 2) The positive relationship between depth and flexibility is weaker for democracies than for non-democracies; and, 3) PTAs that are more flexible contain more constraints on flexibility.

As governments add more flexibility to deep agreements, they are likely to attach constraints to the use of these additional flexibility provisions. Flexibility poses risks for both governments and exporters alike. They may use flexibility to ease adjustment costs and reduce temporarily high costs of compliance, ensuring long-term viability of cooperation. However, they may overuse opt-outs, jeopardising the overall benefits of the agreement in the long run, where governments give rents to particular domestic constituencies.

However, the relationship is conditional on regime type. The 'optimal obfuscation' argument asserts that democracies rely more strongly on non-tariff barriers and trade remedies for protection than non-democracies (Rickard and Kono, 2014). In a democracy, voters see high tariffs as a tax on consumers. In order to satisfy the typically import-oriented interest groups that demand protection from a PTA, governments require devices about which voters have very little information, such as non-tariff barriers. Accordingly, democracies will include flexibility provision even in shallow agreements, such that they can satisfy protectionist demands without incurring the wrath of voters. In comparison, non-democracies do not

need such flexibility conditions in shallow agreements as they have no need to hide their reliance on protectionism for reasons related to voters' concerns (Baccini et al., 2015).

Resultantly, as depth of contract increases, flexibility inclusions will only increase marginally for democracies. The strong relationship between the two features is expected to be higher for non-democracies.

In the pursuit of understanding the PTA characteristics that matter in the determination of trade flows, the majority of insight has concerned depth. It is clear that depth matters, with multiple researchers drawing the same overarching conclusion; deeper agreements contribute to larger bilateral trade flows. The picture is less clear for flexibility conditions.

With respect to flexibility's established relationship with depth, it is understood that it forms an obligation criterion that feeds a deepening commitment across multiple liberalising fronts in the medium-to-long term. As tested by Baccini et al. (2015) long- and short-term flexibility conditions are positively associated with depth. It is a natural association owed to the need for stability across the global marketplace. However, it does not provide a direct insight as to the real-world effect of PTA flexibility conditions.

Flexibility conditions allow for temporary suspension of certain obligations in a given agreement as determined by the signatories. Such suspensions provide policy makers necessary discretion to address domestic political pressures. For example, Pelc (2009) noted that a sudden surge in imports that threatens a domestic industry might make it politically unfeasible for a country to keep its borders fully open to trade as prescribed by the terms of the governing agreement. However, such 'safeguard clauses' may in fact erode both the credibility and trade liberalising effect of international trade agreements (Rosendorff and Milner, 2001).The optimal employment of flexibility provisions is therefore predicated on the relative costs of evoking the clauses and retaining the deal versus abrogating the agreement in their absence. They are certainly an efficient equilibrium under conditions of domestic uncertainty (Koremenos, Lipson and Snidal, 2001). However, their inclusion potentially undermines the compliance of an agreement. Their effectiveness is therefore determined by the associated cost of their use, such that the benefits of cooperation are relative to the benefits of defection (Rosendorff and Milner, 2001). Where the cost of utilising the escape clause is too low, a given nation will evoke it as often as they see fit. This implies that trade will suffer as members break from and reengage the deal. If the cost is too high, the deal will be abrogated. Flexibility conditions are included to weather against future uncertainty (Fearson, 1998). Such uncertainty is exacerbated in the face of increasing domestic liberalisation as prescribed by the conditions of depth; hence the positive association. However, such conditions facilitate a legal 'break of contract' to address the

often protectionist sentiment that hinders trade. Constraint measures as described above represent one means of accounting for the 'reasonable use' of flexibility inclusions. One would expect them to mitigate the extent to which flexibility conditions may dampen bilateral trade. However, in and of themselves, they are still a representation of the future unknown that requires such concessions.

Accordingly, flexibility can reasonably be assumed to influence trade through its ability to engender agreements and facilitate trade through its relationship with depth. However, its direct influence cannot be presumed to be positive. The facilitation of a legal breach to address short term pressures is equally likely to hinder trade, as identified by Rosendorff and Milner (2001). The same can be presumed for the conditions of constraint attached to their use. Accordingly, the logic outlined above is the basis for this chapter's joint third and fourth hypotheses:

H_3: PTAs with greater flexibility conditions have significantly impacted bilateral trade flows for ASEAN nations and their trading partners.
H_4: PTAs with greater inclusions for the conditional use of flexibility have significantly impacted bilateral trade flows for ASEAN nations and their trading partners.

In order to identify the precise nature of this relationship, one can empirically test the flexibility criteria against bilateral trade volumes within the application of a gravity model (as was undertaken for depth by Dür et al., 2014). Flexibility matters greatly as a representation of the intended commitment as it relates to the socio-political needs of its signatories. The gravity model provides a suitable testing ground as means of ascertaining its average contribution to date.

Each hypothesis is made with reference to the ASEAN region, as discussed in the subsequent section. Given its economic clout and potential, ASEAN provides a unique and suitable region to measure. Gravity estimations of depth characteristics have been undertaken for the global trade picture [31], whilst PTAs as binary covariates have been included as a standard gravity policy measure from early foundations. Accordingly, the ASEAN-centric dataset utilised by this chapter will identify the extent to which the ASEAN context aligns with the global picture, whilst also introducing the treatment effect of flexibility, and constraint on flexibility, conditions.

[31] Presented in the works of Dür et al. (2014)

1.3. The Association of Southeast Asian Nations

This section is for the purpose of establishing the motivation for, and suitability of, the ASEAN region as pertains to modelling the trade effects of PTA conditionality.

The ASEAN's suitability is derived from two key motivations. Firstly, the role it plays in fostering regional cooperation, trade, and investment under a preferential trading mechanism. The success it has experienced with respect to economic growth and development deserves contextual and specific focus. Much of this section goes on to further outline this motivational suitability with respect to its history, characteristics, and development trajectory.

Secondly, having been provided a global reference point on the matter of depth conditionality and trade outcomes by Dür et al. (2014) it is of scholarly interest to explore regional groupings in order to identify specific regional characteristics. This chapter therefore contributes to the body of literature on trade agreement characteristics and bilateral trade as the ASEAN was previously un-discussed in this specific literature.

ASEAN has for many years been considered the most durable and successful regional grouping in the developing world (Hill and Menon, 2010). A considerable strength of its collective approach has been in the bloc's ability to promote small-step cooperation towards development: a process by which informal arrangements are developed into ratified and coordinated agreements along a flexible timeline. Such an approach has been crucial in the formation of the ten nations' respective and collective trade agreements.

The success of a given trade agreement is significantly predicated on its sensitivity to domestic requirements, as it operates to establish the mechanisms that strengthen national relationships. The founding ASEAN principles facilitate growing trade ambition mindful of the need for measured control: primarily owed to the grouping's founding motive as a vessel for ensuring stability and cooperation. Accordingly, two developments promote interest with respect to ASEANs trade agreement progress.

Firstly, there is the aforementioned development of meaningful classification metrics for PTA characteristic design variance (Dür et al., 2014; Baccini et al., 2015). Having been used to measure the average global story, it is useful to identify regional experiences. The second relates to the decade of sustained growth and development that is predicted to continue in the region. Understanding the design features of a primary trade tool holds significant interest with respect to future agreements concerning the region.

The rest of this section outlines the formation of the block as well as an overview of its credentials with respect to growth and output. Finally, we consider the ASEAN PTA situation as a means of underlining the importance of the subject for this region.

1.3.1. Establishment and Overview

ASEAN was founded in 1967 as a representative body for regional cooperation between nations in Southeast Asia. It was born out of reconciliation talks held by Thailand between Indonesia, the Philippines, and Malaysia, which realised that stability and dialogue would be crucial for the future of the region. In the additional company of Singapore, the foreign minister for each nation worked in unison to establish the ASEAN Declaration[32], establishing the principles that continue to underpin the association: corporation[33], peace, and stability[34] (ASEAN, 2018). The process by which these principles are met is associated with "building on small steps" (ASEAN, 2018), whereby informal and voluntary arrangements build towards binding and institutionalised agreements such as: the Treaty of Amity and Cooperation in Southeast Asia (1976), and the Treaty on the Southeast Asia Nuclear-Weapon-Free Zone (1995). Since its conception, the institution has grown to represent ten nation states: Brunei (1984), Vietnam (1995), Lao PDR and Myanmar (both 1997), and Cambodia (1999).

The importance of economic corporation as a means of regional advancement was acknowledged from the very beginning. In his first speech after the signing of the ASEAN declaration, Philippine Secretary of Foreign Affairs, Narciso Ramos, proclaimed that "ASEAN [would] marshal the still untapped potentials of the region through more substantial united action" so that it did not waste its "meagre resources in the overlapping endeavours of sister states." The early steps of this economic cooperation began in the 1970s with a focus on industrial cooperation. Thereafter, following post-crises recovery in the 1980s, ASEAN took a significant step towards integrating the regional market through the establishment of the AFTA in 1992, and the signing of the ASEAN Framework Agreement on Services (AFAS) in 1995: working respectively to reduce intra-ASEAN tariffs and establish a basis for services liberalisation in the region.

Despite the onset of the Asian financial crisis in 1997, ASEAN continued with its economic integration agenda with the signing of the Framework Agreement on ASEAN Investment Area (AIA) in October 1998 to enhance its attractiveness as a single investment destination. This was further manifested by the historic

[32] Also known as the Bangkok Declaration.

[33] Across the economic, social, cultural, technical, educational, and other fields.

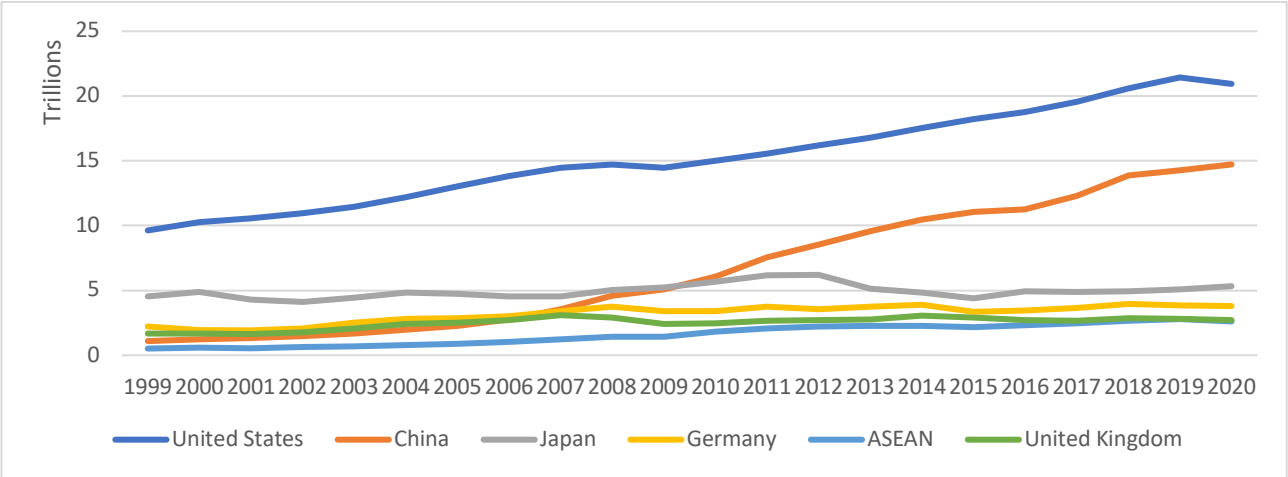
[34] Through abiding respect for justice and the rule of law, and adherence to the principles of the United Nations Charter.

Bali Concord II in 2003 when ASEAN leaders agreed to establish the ASEAN Economic Community (AEC) by 2020, later accelerated by 5 years to 2015. ASEAN commitment to advancing regional economic integration continued through the 2008-2009 global financial crisis with the signing of the ASEAN Trade in Goods Agreement (ATIGA) in 2009, the entry into force of the ASEAN Comprehensive Investment Agreement (ACIA) in 2012, and the adoption of the ASEAN Financial Integration Framework in 2011. The formal establishment of the AEC on 31 December 2015 marked an important milestone in ASEAN's dynamic journey towards deeper regional economic integration.

1.3.2. Regional Development

Following the ratification of the ASEAN FTA in 1999, regional GDP has grown remarkably, from $553bn, to over $3trn in 2020. As of 2017, it overtook the United Kingdom in terms of GDP to become the fourth largest global economy and the third largest in Asia behind the powerhouses of China and Japan (see Figure 1.4).

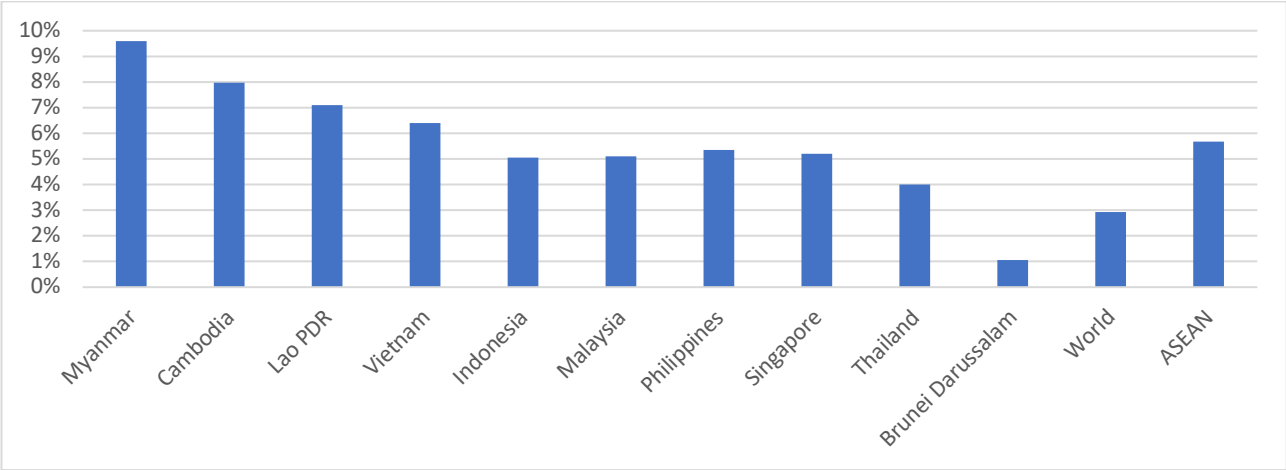
Figure 1.4: ASEAN and Top 5 Global Economies GDP (Current US$), 1999-2020



Source: World Bank (2021)

Figure 1.5 highlights an average annual growth in GDP of 5.6 percent. This compares favourably to the world GDP average increase of 2.9 percent per year over the same period. The regional grouping includes three of the 15 fastest growing economies in the 21st century with Myanmar (2nd) growing at an average of 9.6 percent, Cambodia (9th) at 8 percent, and Lao (15th) at 7.1 percent. Alongside Vietnam's impressive annual growth of 6.4%, the CLMV grouping is predicted to continue its strong growth driven by improvements in domestic consumption, rising FDI, and growth in manufacturing exports (PWC, 2018).

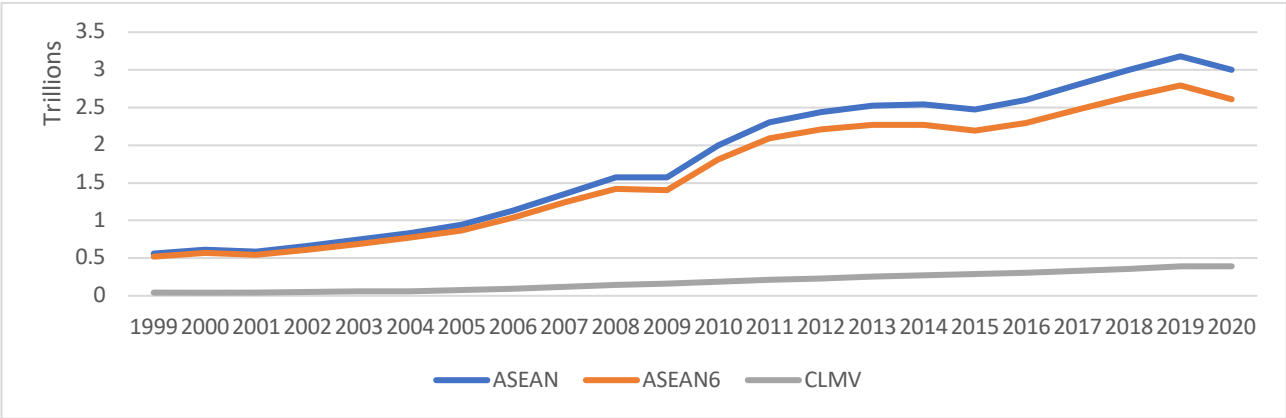
Figure 1.5: Average annual GDP growth (%), 1999-2019[35]



Source: World Bank (2021)

Currently, the ASEAN economy remains highly concentrated around the group of its original signatories, with over 87 percent of collective GDP produced between them (as exhibited in Figure 1.6). Of this group, Indonesia alone accounts for 35 percent of output, followed by Thailand at 16 percent, and Singapore, Malaysia and the Philippines contributing over 11 percent each. Of the CLMV grouping, Vietnam boasts the largest economy, generating 9% of ASEAN's GDP.

Figure 1.6: ASEAN GDP (Current US$), 1999-2020

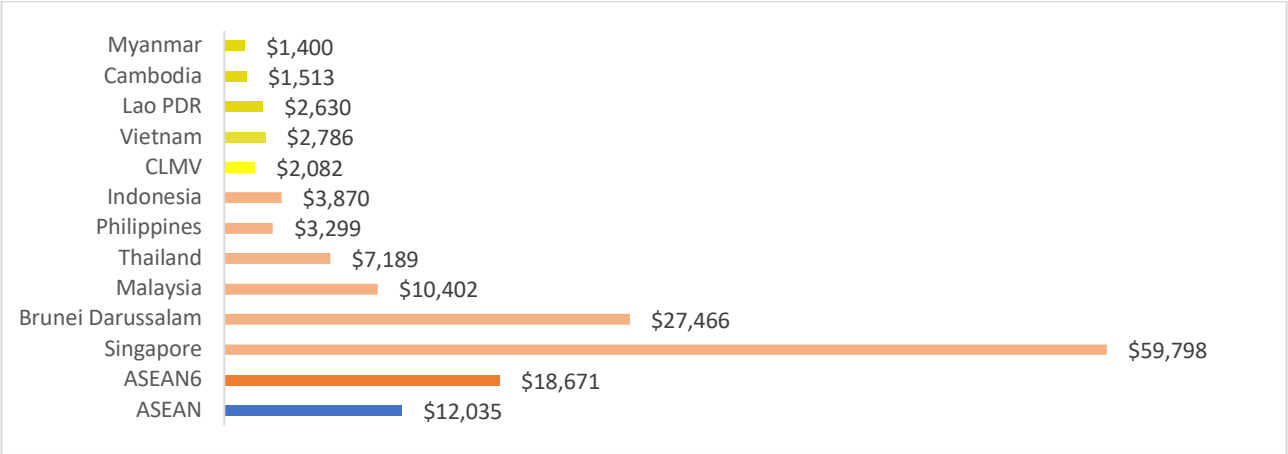


Source: World Bank (2021)

If we consider Figure 1.7, we can see that GDP per capita figures are equally diverse, with Singapore and Brunei boasting per person earnings 5 and 2.5 times higher than the regional average. In terms of regional disparity, the average income of the ASEAN population residing in CLMV nations is considerably less than those living in the ASEAN6 nations.

[35] 2020 data was omitted due to the contractionary and unpredicted effects of the global Covid-19 pandemic.

Figure 1.7: ASEAN GDP per capita (Current US$), 2019[36]

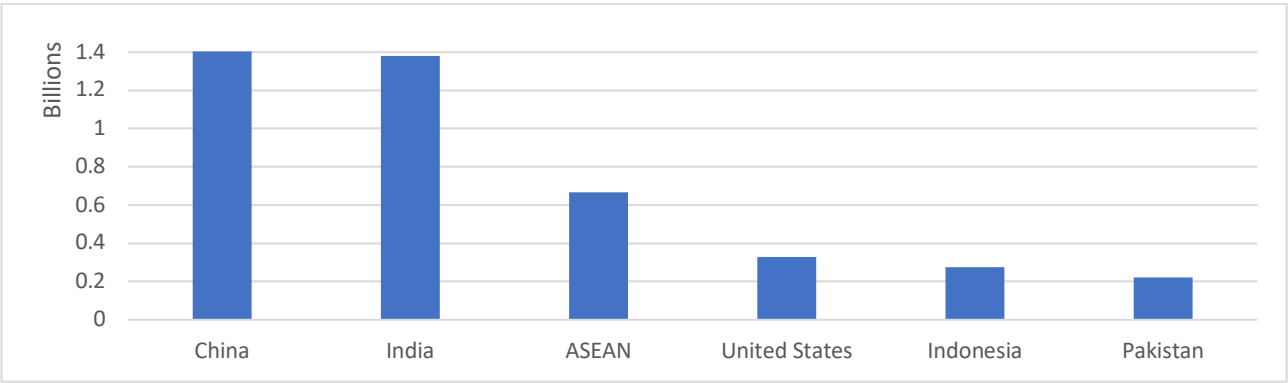


Source: World Bank (2021)

In line with the PWC (2018) report, the OECD (2018) has backed significant and sustained growth for the Southeast Asian region from 2018 to 2022, built upon robust domestic private spending and the implementation of planned infrastructure initiatives. Of the ten nations, Cambodia, Lao PDR, and Myanmar are predicted to continue their growth with the fastest rates in the region.

These remarkable growth figures and projections are furthered by the joint populations of ASEAN boasting the world's third largest consumer market, behind only China and India. As shown in Figure 1.8, even limiting the joint population to the ASEAN 6 yields the fourth largest consumer market behind only ASEAN.

Figure 1.8: Top Five National Populations, 2020



Source: World Bank (2021)

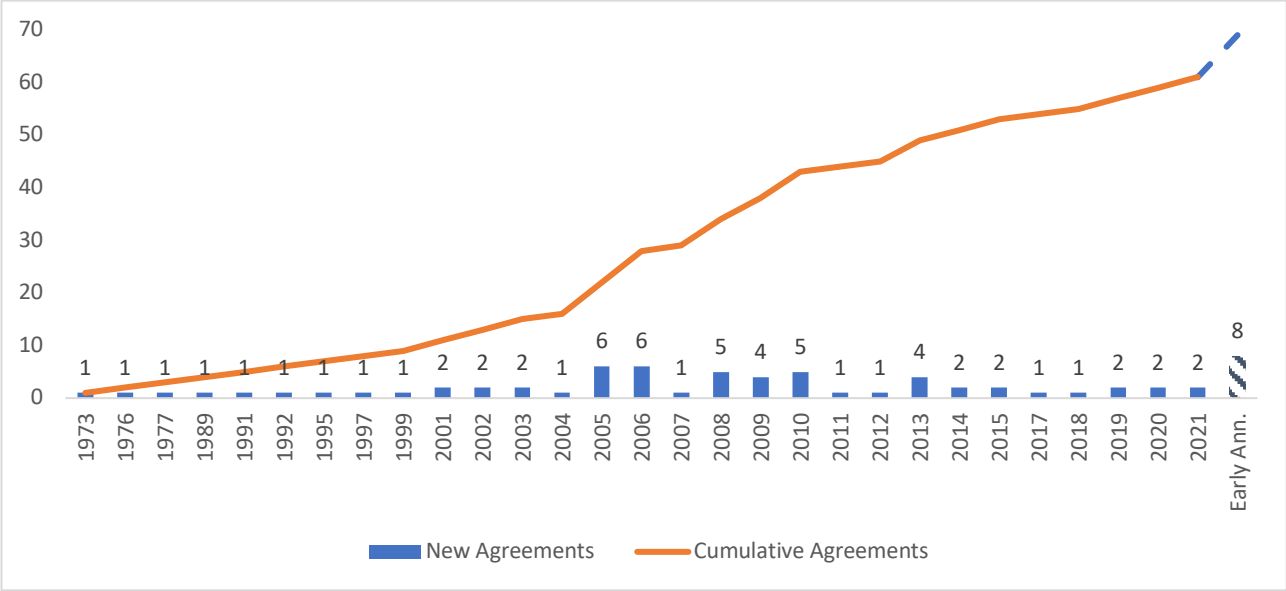
[36] 2020 data was omitted due to the contractionary and unpredicted effects of the global Covid-19 pandemic.

ASEAN PTA Overview

One of the driving forces in the development and growth within the ASEAN region has been the development of PTAs. Cumulatively, ASEAN nations have 54 PTA's currently in force, and a further 8 early announcements in place with the WTO. Following the global pattern, early uptake was modest and paced, with no more than one agreement signed a year. Accordingly, the 2000s witness a large increase in formation and signing of various PTAs. See Figure 1.9.

As an institution, ASEAN has signed 11 PTAs, which following WTO classification procedure these include base treaties, accessions, and amendments. Accordingly, an agreement such as the ASEAN FTA is included four times; once for formation, and three additional occasions for accessions. Each sovereign state is currently involved in multiple PTAs. Cambodia and Myanmar are the only members to have no PTAs set outside the ASEAN. In comparison, Singapore, Malaysia and Thailand have considerably more agreements in place (27, 20 and 18, respectively).

Figure 1.9: Growth in PTAs per year.



Source: World Trade Organisation (2021)

On average, ASEAN states have a PTA in place for at least seven of their top ten exporters, and eight of their top ten importers. When early-announcement agreements for Thailand, Indonesia, Malaysia, and the Philippines come into play with the EU, these figures will rise to eight and nine respectively.

ASEAN has been deepening intra-regional integration whilst simultaneously forming cooperative arrangements with partner countries this runs parallel to single member states pursuing their individual

trade accords (Plummer and Wignaraja, 2007). PTAs represent the tool of choice and therefore reinforce the importance of understanding how their specific characteristics have played out across time.

Early agreements follow a number of trends that can be explained by the ASEAN-centric vision for regional cooperation and development. In a study of PTA-depth, undertaken by Hofmann et al. (2017), Southeast Asian countries tend to be involved in shallower agreements than their European and North American counterparts. Shallower agreements contain a lower number of ratified conditions and typically avoid those that require significant domestic market reform such as competition policy or environmental control. This is unsurprising in the context of the primary ASEAN principles of "lasting peace, security and stability" (ASEAN, 2015). The focus on ensuring that these principles are met entails that steps towards economic integration should not be at the expense of domestic stability. As shown by Dür et al. (2015), increased depth of contract requires increased domestic policy change for the purpose of adherence and avoidance of breach. Particularly in developing nations (of which ASEAN represents many), enhanced depth is theoretically associated with heightened domestic tensions. ASEAN's pursuit of "sustained economic growth" (ASEAN, 2015) is not prioritised above its requirement for stability. This feature is furthered by the observation that Asia contains the most inter-regional trade agreements in the world (45) (Hofmann et al., 2017).

These characteristics help explain the insight of Mutaquin and Ichihashi (2013), who identify that the deepening of regional trade ties through the formation and adoption of the ASEAN FTA yielded positive trade outcomes for the six original signatories, whilst noting that the same was not true upon the introduction of the CLMV. These findings are in line with findings by Doanh and Heo (2009), Hapsari and Mangunsong (2006), and Bun, Klaassen and Tan (2009). These findings in context promote the theory that ASEAN economic development is predicated upon security: wherein this is found, economic objectives can be pursued (ASEAN 6), whilst in the case of instability, economy is not the primary driver (CLMV).

The difficulty in further ascertaining the truth of this conjecture has been in the limited understanding of PTA characteristics. If it is indeed the case that stability is the primary driver of ASEAN agreements, one would expect to see a positive association with the flexibility conditions utilised in this chapter. Depth alone says little of the real requirements to adhere to the principles laid down. Flexibility provisions represent context in the function of a specific agreement. Resulting from the unique development approach, utilisation of PTAs and increasing global importance, ASEAN provides a suitable sample to further test the theory that design matters: and moreover, that flexibility has been an integral tool. This is reinforced by the recently ratified ambitions to establish an economic community and develop the establishment of a common market. The ASEAN 2025 vision sets out a more integrated region built upon three interrelated and

mutually reinforcing pillars: political-security, economic, and socio-cultural. Of primary interest, the economic pillar is working towards an economic community that is highly integrated, cohesive, competitive, innovative and integrated within the global economy (ASEAN, 2015).

The AEC plan identifies its core objective as ensuring ASEAN becomes "a highly integrated and cohesive economy" entailing the "reduction or elimination of border and behind the border regulatory barriers". Accordingly, PTAs will be reviewed either in direct address (inter-ASEAN agreements such as AFTA) or in response to change in ASEAN conditionalities (bilateral or plurilateral agreements signed by individual states such as Singapore-Panama).

1.4. The Gravity Model of International Trade

The Gravity Model has been utilised to analyse trade flows for the past 50 years. It is recognised as 'the workhorse of empirical trade modelling', demonstrating a remarkably close fit to real trends. The early intuitive model (see table 1.6) provided a useful foundation for understanding the components of trade with its two key propositions; that bilateral trade is proportional to GDP ('mass'), and inversely proportional to distance.

Table 1.6: Intuitive Gravity Model Overview

In 1962, Jan Tinbergen proposed the gravity model as an intuitive way of understanding international trade flows. In its basic linear form:

[1a] $$\log X_{ij} = c + b_1 \log GDP_i + b_2 \log GDP_j + b_3 \log \tau_{ij} + e_{ij}$$

[1b] $$\log \tau_{ij} = \log(dis \tan c_{ij})$$

Where X_{ij} denotes exports from country *i* to country *j*; GDP is each country's gross domestic product; τ_{ij} represents trade costs between *i* and *j*, proxied as distance (defined as the geographical distance between the two countries); and e_{ij} is a random error term. The *c* term is a regression constant and the *b* terms are coefficients to be estimated.

Inspired by Newton's Law of Universal Gravitation, the gravity model for trade derives from the observation that the nonlinear form of the basic gravity model above resembles Newton's law of gravity. Evoking similar planetary phrasing for trade: bilateral trade is directly proportional to the exporting and importing countries' economic 'mass', whilst trade is inversely proportional to the distance between them.

By this logic one would expect larger country pairs to trade more (a reflection of growing consumer choice preferences) but expect countries that are further apart to trade less (as the cost of transportation would be too high).

However, once more advanced concepts in the literature were introduced the model ran into explanatory trouble. The primary example of this is the issue of multilateral resistance. Consider the impact on trade between two countries (*i* and *j*) from a change in trade costs between countries *i* and *k*. This could be represented by the introduction of a PTA that lowers tariffs on goods traded between countries *i* and *k*. Basic economic theory would predict that the new PTA would impact country *j's* trade as it is not party to the agreement; trade-creation and trade-diversion are well known effects of this 'trade cost' phenomenon. Unfortunately, the intuitive gravity model is unable to account for this issue. It predicts that the reduction of trade costs on one bilateral route will not impact the trade on another.

1.4.1. Structural Gravity

The issues in the gravity model focused researchers towards theory to provide a solid basis for a gravity-like model of trade. It took a number of years of heavy scrutiny before one finally gained acceptance.

Anderson and Van Wincoop's 2003 model theoretically rooted 'gravity with gravitas', which represented a meaningful stride for the concept's furtherance and ultimate acceptance. It is the first significant theoretical conception of gravity-like modelling and has subsequently become the standard for researchers' own employment of the model.

At its most basic, the Anderson and Van Wincoop (2003) methodology is essentially underpinned by a demand function. It owes much of its final form to the constant elasticity of the substitution structure chosen for consumer preferences. It postulates that consumers have a 'love of variety' preference structure meaning that their utility increases both from consuming more of a given product, or from consuming a wider range of varieties.

On the production side, the model makes assumptions that are standard following Krugman (1979). Each firm produces a single, unique product variety under increasing returns to scale. By assuming a large number of firms, competitive interactions disappear, and firms engage in constant markup pricing. In equilibrium, the difference between price and marginal cost is just enough to cover the fixed cost of market entry.

In this model, a producer in one country can sell goods in any country. To simplify the model, selling goods in one's own country is assumed to entail zero transport costs. However, selling internationally does involve transport costs. Consumers therefore consume produce varieties from all countries, but the prices of non-domestically produced varieties are adjusted upwards to take account of the cost of moving goods between countries.

These building blocks make it possible to derive an equilibrium in which firms both produce for the local market and engage in international trade, and in which consumers consume accordingly. The basic model provides expressions for the volume of exports by each firm. Aggregating across firms within an economy then makes it possible to derive an expression for the total value of a country's exports, which is the dependent variable in the gravity model.

Taking the model's foundations and turning them into a gravity-like model requires imposing some macroeconomic accounting identities. These flow from the fact that in the single sector economy being modelled, the sum of all production must be equal to GDP. The resulting aggregation of these steps delivers the 'gravity with gravitas' model.

The equation is as follows:

[2a] $$logX_{ij} = logY_i + logE_j + (1-\sigma)\left[log\tau_{ij} - log\Pi_i - logP_j\right]$$

[2b] $$\Pi_i = \sum_{j=1}^{C} \left\{\frac{\tau_{ij}}{P_j}\right\}^{1-\sigma} \frac{E_j}{Y}$$

[2c] $$P_j = \sum_{i=1}^{C} \left\{\frac{\tau_{ij}}{\Pi_i}\right\}^{1-\sigma} \frac{Y_i}{Y}$$

Where *X* is exports indexed over countries (*I* and *j*) *Y* is GDP, *E* is expenditure, σ is the intra-sectoral elasticity of substitution (between varieties), and τ_{ij} represents trade costs.

The first notable features are the inclusion of two additional variables: Π_i and P_j. These variables represent the theoretical underpinnings that allow the model to work. Π_i is the outward multilateral resistance term and it captures the fact that exports from country *I* to country *j* depend on trade costs across all possible export markets. P_j is the inward multilateral resistance term, and it captures the dependence of imports into country *I* from country *j* on trade costs across all possible suppliers. Together, these terms resolve the issues with the intuitive model. It now reflects the fact that changes in trade cost on one bilateral route can affect trade flows on all other routes because of relative price effects.

With respect to the dataset, the structural gravity model has a number of implications for the way in which a gravity model should be set up, and the types of data that should be used (Shepherd, 2016). The final variable that needs specified from [2a] is the trade cost function τ_{ij}. The literature typically specifies this function in terms of observable variables that are believed to influence trade costs, using a simple log-linear specification. The general basic specification of the trade costs function is as follows:

[2d] $$\tau_{ij} = b_1 logdistance_{ij} + b_2 contig + b_3 comlang\_off + b_4 colony + b_5 comcol$$

Here, distance is the geographical distance between countries *i* and *j*; *contig* is a dummy variable equal to unity for countries that share a common land border; *comlang_off* is a dummy variable equal to unity for country pairs that share a common official language; *colony* is a dummy variable equal to unity if countries *I* and *j* were once in a colonial relationship; and, *comcol* is a dummy equal to unity for country pairs that were colonised by the same power.

1.4.2. Challenges and Developments

Having established the structural form to be utilised for testing the dataset, it is crucial to address the acknowledged misspecification traps identified in the literature in order to capitalise upon the latest developments. Accordingly, this section establishes relevant challenges and their respective solutions to ensure a comprehensive and theoretically consistent gravity specification that will deliver robust and significant estimates.

The quintessential challenge presented by the Gravity Model was that of the aforementioned multilateral resistance issue. In response, Hummels (1999) and Feenstra (2002) proposed the inclusion of country fixed effects, prior to Anderson and van Wincoop's (2003) promotion of multilateral resistance terms (MRTs). The failure to adequately control for the incorporation of MRTs within earlier models was considered to be the "gold medal mistake" of gravity misspecification (Baldwin and Taglioni, 2006). The difficulty, however, was that MRTs are theoretical constructs and as such not directly observable by the researcher. Various approaches were subsequently proposed: Anderson and van Wincoop (2003) suggested an iterative custom nonlinear least squares program approach; Head and Ries (2001) adopted a ratios-based approach; and Baier and Bergstrand (2009) utilised a reduced-form version of Anderson and van Wincoop's (2003) custom version by approximating multilateral resistance terms as functions of bilateral distance. The problems associated with respect to the computational issues of custom forms (Yotov et al., 2016), and the limited theoretical resemblance of multilateral resistance under the ratios approach (Head and Mayer, 2014), have limited the recommended use of these approaches.

Subsequently, the approach first advocated by Hummels (1999), and reiterated by Feenstra (2016) was to use directional fixed effects, incorporated within the model as a set of exporter and importer dummy variables.

Olivero and Yotov (2012) extended the cross-section recommendation to demonstrate that the multilateral resistance terms should be accounted for by exporter-year and importer-year fixed effects in a dynamic

gravity equation framework with panel data. It should be noted that these fixed effects will also absorb the size variables, alongside characteristics such as national policies, institutions, and exchange rates.

A traditional challenge to reliable gravity estimates has been the presence of zero-trade flows in bilateral trade datasets. Employing an OLS estimator determines that these trade flows are dropped from the estimation sample upon transformation to logarithmic form. This presents a major issue in the form of disaggregation of trade data, and resultant loss of important trade insights within the zero-trade flow observation group (Eaton and Kortum, 2002; Yotov et al., 2017). Several approaches have been advocated, including Tobit estimation (Martin and Pham, 2008), two-step selection (Helpman et al., 2008), and two-part gravity estimation (Egger et al., 2011). However, Santos Silva and Tenreyro (2006) have promoted a convenient solution by estimating the gravity model in its multiplicative form and employing the PPML estimator. As noted by Yotov et al. (2016), the "Monte Carlo simulations show that the PPML estimator performs very well even when the proportion of zero's is large." Beyond its ability to deal with zero-trade flow observations, the use of PPML also effectively addresses the issue of heteroskedasticity, which would otherwise render gravity estimates biased and inconsistent (Anderson and van Wincoop, 2003; Santos Silva and Tenreyro, 2006).

Endogeneity has been an equally persistent problem in the modelling of trade relationships (Trefler, 1993); particularly when it comes to obtaining reliable estimates of the effects of trade policy. This is because trade policy is potentially correlated with unobservable cross-sectional trade costs. For example, reverse causality is expected where nations are more likely to liberalise trade with an already significant trade partner, all else being equal. Yotov et al. (2016) identify that the early attempts to address endogeneity using standard instrumental variable treatments were unsuccessful[37]. This can be explained through the insight of Trefler (1993) that the presence of a PTA is not exogenous and, as such, the estimated effects of such agreements on trade flows may be biased. As furthered in discussion by Baier and Bergstrand (2007), gravity estimations attempting to address the bias caused by endogenous PTAs, through the use of instrumental variables, provide at best mixed evidence of isolating the effect due to a lack of suitable instruments and a greater degree of inferential error. Instrumental variables can of course estimate consistent parameters in the event that an economic agent's decisions to select the PTA are unrelated to the unobservable factors influencing the outcome (Heckman, 1997). It is however accepted that unobservable policies tending to inhibit trade, such as nontariff barriers and domestic regulations, are often one of the

[37] Papers of particular note here include Baier and Bergstrand (2002, 2007), and Magee (2003). The choice of instrumental variables included: the presence of democracy, logged difference in GDP, presence of airports, and being landlocked.

main reasons that governments have selected into the agreements (Baier and Bergstrand, 2002). Accordingly, instrumental variables do not yield consistent estimates in the presence of such selection bias.

They instead advocate applying the average treatment effect methods of Wooldridge (2010), specifically either the first differencing of bilateral trade flows (for where additional trade cost variables are of interest beyond the influence of trade agreements), or the inclusion of country-pair fixed effects (for where garnering the influence of policy is the primary objective). In particular, the Wooldridge approach is advocated as it can eliminate, or best account for, the unobservable linkages between the endogenous trade policy covariate and the error term in gravity regressions. This holds particularly where the number of time periods exceeds two.

It is accepted that there is no easy fix for addressing the issue of endogeneity in the gravity model. Next to the inclusion of a full set of fixed effects, the advocated method of choice would be to use the previously discussed instrumental variable (IV) approach (UNCTAD, 2014). This method allows one to proxy for the problematic independent variable with a directly related proxy that has no relationship with the error term. The problem with proxying for tools of trade, such as PTAs, is that there is no perfect solution. The Huasman and Taylor (1981) IV approach and the Generalised Method of Moments (GMM) estimations present plausible alternatives to fixed effects but are both highly sensitive to the number of lags used.

Accordingly, country-pair fixed effects will absorb all bilateral time-invariant covariates (such as bilateral distance) that are used as standard in the gravity model literature. This ensure that the endogeneity bias associated with such unobservable covariates is mitigated They will not however prevent the estimation of the effects of a bilateral trade policy since trade policies are time varying[38]. Egger and Nigai (2015) and Agnosteva et al. (2014) have demonstrated how pair-fixed effects are a better measurement of bilateral trade costs than the standard set of gravity variables. An additional benefit of including country-pair fixed effects is its ability to address multilateral resistance in a dynamic panel data (Piermartini and Yotov, 2014). Thus, the methodological adoption of a full set of fixed effects ensures that the issue of endogeneity is accounted for, addressing the omitted variable bias issue.

A further challenge is the time contingent adjustments to trade policy changes; as trade policy changes are unlikely to be instantaneous (Trefler, 2004). The issue is even more pronounced under fixed-effect estimation when applies to consecutively pooled panel-data (Cheng and Wall, 2005). Accordingly,

[38] It is of course important to note that this leaves room for unobservable bilateral time-variant covariates to introduce some endogeneity bias.

robustness checks are conducted utilising time lags in gravity estimation. Lags of three and five years have been identified as the most significant (Olivero and Yotov, 2014).

Reverse causality is an ever-present question that must be addressed when modelling trade tools such as PTAs (Shepherd, 2016). Do trade agreements increase trade, or does increased trade bring about trade agreements? Accordingly, as a form of robustness checking for the regression sets, each index will be estimated using a three-year lead in order to identify whether or not there is a statistical correlation where there should not be one. For example, the bilateral trade flow between Singapore and Panama in 2001 should not influenced by the depth of the Singapore-Panama FTA that came into effect in 2006.

1.5. Empirical Testing and Results

This section contains the results and discussion surrounding the gravity methodology. It begins by providing an overview of the dataset contents before moving on to discuss the model testing of the ASEAN bilateral trade dataset and indexes under Poisson Pseudo-Maximum Likelihood (PPML) regressions. It establishes the underlying necessity of fixed effects variables in order to account for multilateral resistance. Model 1 incorporates only country-time fixed effects, before model 2 introduces country pair fixed effects. Model 3 utilises time-lagged testing of three and five years to ascertain the real impact of PTA ratification.

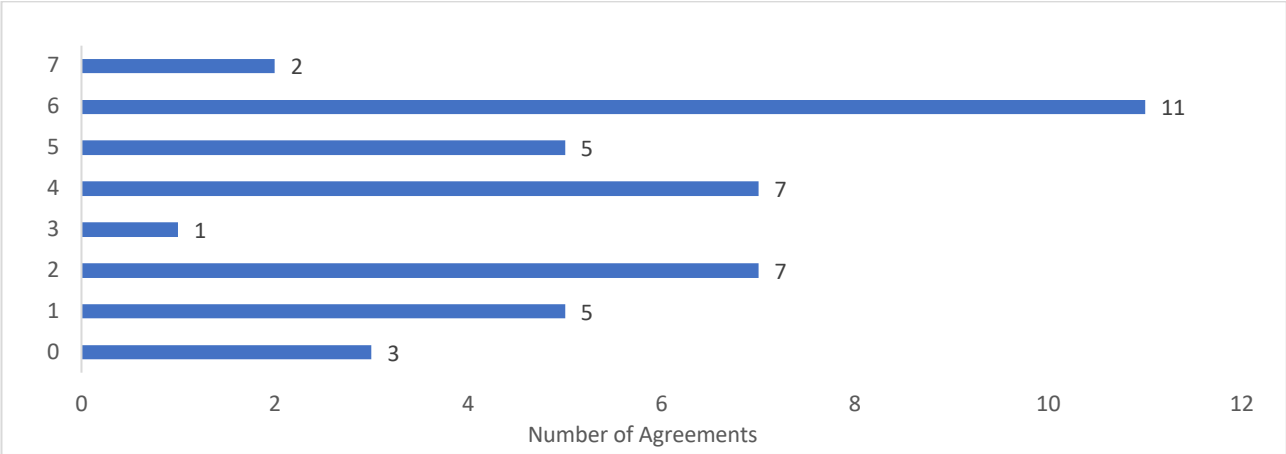
1.5.1. Dataset Description

The dataset has been developed to capture the influence of PTAs, and their design, on ASEAN bilateral trade between 1948-2015. It contains all bilateral partnerships that include at least one ASEAN member state between the ASEAN 10 and the 192 additional nations[39]. Accordingly, each ASEAN nation has 201 bilateral partnerships. Bilateral trade data was sourced from the IMF's DOTS and covers the period 1948-2015. All PTAs have been introduced from the DESTA database. In total there are 41 PTA's, of which 34 are WTO ratified, and the majority of which are bilateral (26); additionally, nine are plurilateral, and six are plurilateral concerning a third country. Each PTA is coded across four indexes developed by the DESTA team: depth_index, depth_rasch, flex_escape and flex_rigid. All further gravity variables come from the reputable and extensive CEPII Gravity Dataset. Figures 1.11 to 1.16 display the variation of index scores between the 41 trade agreements in the dataset, as well as the plotting of values across time.

Figure 1.10 depicts the depth measure index values associated with each PTA. The values capture the extent to which an agreement builds in the conditions to remove trade frictions, such as tariffs, quotas, and to align market conditions for freer trade. The level of depth across the agreements varies but the average index value is 3.8. Seven key conditions are listed in Table 1.3 and represent the typical market frictions to be addressed such as intellectual property rights, services and investments. The Australia-Singapore FTA (2003) and the Korea-Singapore FTA (2006) have the highest level of depth, whilst the Protocol on Trade Negotiations (1973), the Global System of Trade Preferences (1989), and he Laos-Thailand Trade Agreement (1991) have indexes of zero. A trade deal with zero depth represents a 'talk-shop' approach to improving political relations with the underlying intentions of facilitating later trade.

[39] All nations are represented on the IMFs direction of trade statistics database (DOTS).

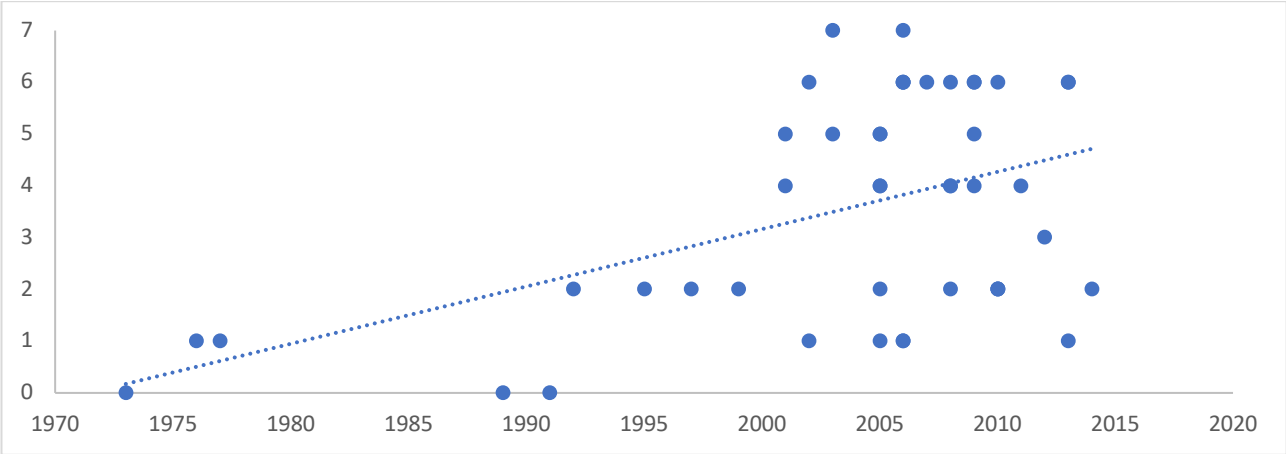
Figure 1.10: Depth Condition Values per PTA (0-7 Depth Index Scale)



Source: Dür et al. (2014)

Figure 1.11 again conforms with the identified PTA-Depth relationship found across the full set of agreements by Baccini et al. (2015) that agreements have become deeper over time.

Figure 1.11: PTA Depth (depth_index) values

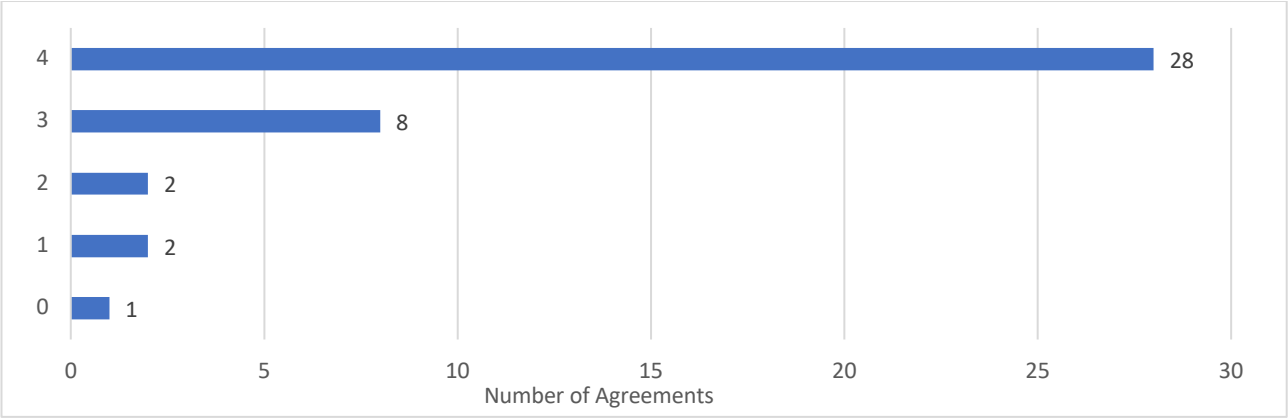


Source: Dür et al. (2014)

Figure 1.12 contains the PTA index values with respect to the level of flexibility afforded in a given agreement. As outlined in Table 1.4, there are four long-term flexibility provisions that signatories can utilise to address short-term domestic market disruption without illegally breaching the PTA. For example, a provision for the imposition of countervailing duties would allow a nation to address industrial disruption imposed by the import of goods privy to home-market subsidy that imposes a disadvantage on domestic production of that same good. Under a PTA that allows this, no state is in violation of the agreement and is able to address the domestic concerns. Twenty-eight of the agreements have a full value of four including the Global System of Trade Preferences (1989), ASEAN-Japan Free Trade Deal (2008), and the Chile-

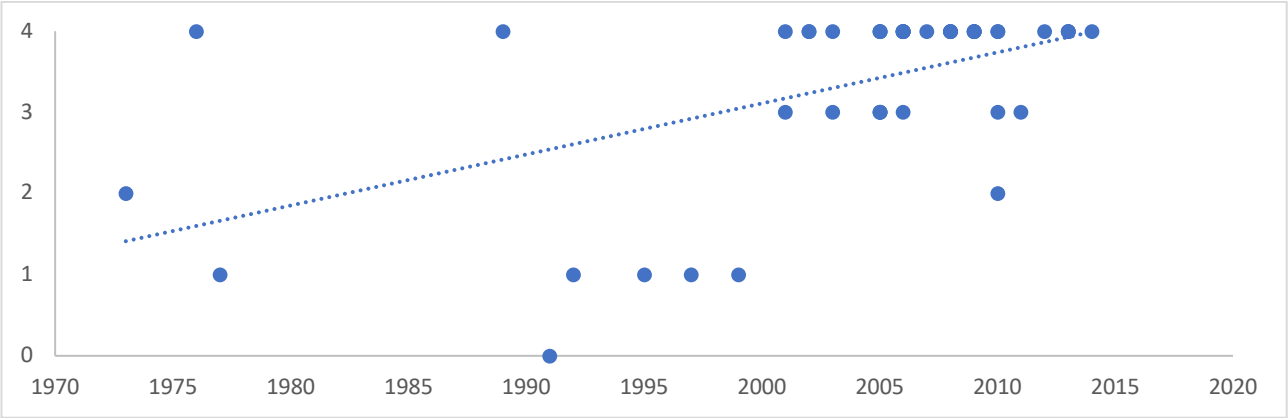
Vietnam Free Trade Deal (2014). In accordance with the literature of Baccini et al. (2015), there has been a growth towards greater flexibility across time (Figure 1.13).

Figure 1.12: Flexibility Values per PTA (0-4 Flexibility Index Scale)



Source: Baccini et al. (2015)

Figure 1.13: Flexibility Inclusion Across Time

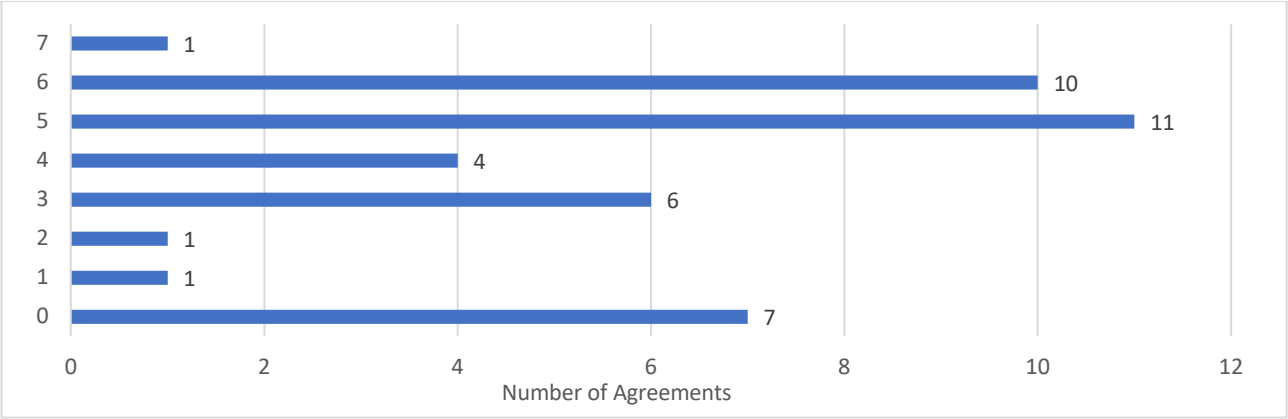


Source: Baccini et al. (2015)

Figure 1.14 depicts the index values that capture the relative level of constraint on flexibility contained within a given PTA. This is the extent to which flexibility conditions are easy to enact by a nation within the agreement. The scale ranges from zero, where no rigidity is placed on the use of a flexibility condition, to seven, where the use of a flexibility inclusion is highly conditional on the pre-determined conditions for action. These conditions are contained in Table 1.5 and represent the primary provisions that govern the acceptable use of national protection measures within a trade agreement. Such an example would include a provision allowing for safeguard measures such as the imposition of anti-dumping duties, only during a transition period. The safeguard measure is the included mechanisms of flexibility, with the specification that it is limited to a specific circumstance acting as condition for its action. The more conditions of use included in a PTA, the higher the index score. The average agreement in the dataset contains an index value

of 3.9. The Singapore-Jordan Free Trade Agreement signed in 2005 has the highest constraint index score at 7.

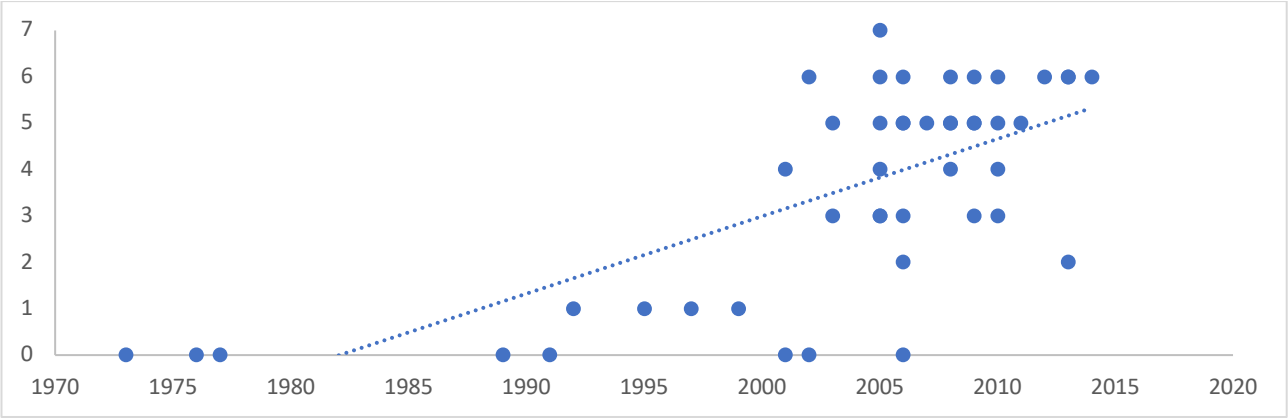
Figure 1.14: Constraint on Flexibility Values per PTA (0-7 flex_rigid Index Scale)



Source: Baccini et al. (2015)

In line with the findings of Baccini et al (2015), the inclusion of constraint conditions in ASEAN-nation signed PTAs has increased across time (see Figure 1.15). Early inclusions of flexibility in trade agreements where not typically bounded by the conditionality imposed by rigidity inclusions: such as the Protocol on Trade Negotiations (1975), the Bangkok Agreement (1976), or the original ASEAN Preferential Trade Agreement between Indonesia, Malaysia, the Philippines, Singapore, and Thailand (1977).

Figure 1.15: Constraint on Flexibility Inclusion Across Time



Source: Baccini et al. (2015)

Appendix A3 contains further information on the dataset contents within a PTA information table that details each agreement alongside its year of entry into force, the members of the agreement, and the four index scores associated with it. Appendix A4 provides some further descriptive tables of the PTA's and their characteristic indexes, including the depth_rasch ratio value table. All of the results for depth_rasch

will be contained within the appendix in order to provide some comparative robustness for depth findings when compared against the published global results.

1.5.2. Baseline Testing

The econometric specification of the gravity model has iterated and evolved regularly since its introduction half a century ago; and particularly since the structural advancement proposed by Anderson and van Wincoop (2003). Accordingly, this chapter employs the fixed effect gravity model form that necessarily captures fixed effects and accounts for bilateral partners across time. In line with the empirical advancements outlined in Yotov et al. (2017), all models are run using a Poisson Pseudo Maximum Likelihood (PPML) estimator due to its methodological suitability. It addresses both the presence of zero-trade flows (Santos Silva and Tenreyro, 2006) and effectively addresses the issue of heteroskedasticity, which would otherwise render gravity estimates biased and inconsistent (Anderson and van Wincoop, 2003).

Accordingly, this chapter employs the base econometric specification outlined below to ensure a theoretically grounded and econometrically consistent model.

$$(3a)\ \mathrm{X}_{ij,t} = c + \beta_1 \ln GDP_{i,t} + \beta_2 \ln GDP_{j,t} + \beta_3 \tau_{ij,t} + \beta_5 \mathrm{PTA\_INDEX}_{ij,t} + \left[FE_{ij}\right] + e_{ij,t}$$

$$(3b)\ \tau_{ij,t} = \ln\left(DIST_{ij}\right) + CONT_{ij} + COMLANG_{ij,t} + COLONY_{ij}$$

$\mathrm{X}_{ij,t}$ represents bilateral trade between exporter *i* and importer *j* at time *t;* whilst GDP is the proxy for national size. $\tau_{ij,t}$ includes the standard proxies for trade cost: distance (DIST) in km between bilateral nation pairs; contiguity (CONT) as a binary variable equal to one where countries *i* and *j* share a border: presence of a common language (COMLANG) as a binary dummy equal to one where both countries predominantly speak the same native language; and colonial ties (COLONY) as a binary variable equal to one where both nations have a shared colonial history. PTA_INDEX represents the inclusion of one of the four PTA characteristic indexes (*flex_rigid, flex_escape, depth_index, depth_rasch*). Fixed effects are represented by FE_{ij}.

In order to establish a methodologically appropriate baseline model the dataset will first be tested using the variation of 3a outlined below. Establishing a baseline is necessary to ensure that covariates perform in line with the established literature expectations. It can also be used to identify any ASEAN-centric behaviours that stand out when compared to the global trends.

$$\mathrm{X}_{ij,t} = c + \beta_1 \ln GDP_{i,t} + \beta_2 \ln GDP_{j,t} + \beta_3 \tau_{ij,t} + \beta_5 \mathrm{PTA\_INDEX}_{ij,t} + \Pi_i + \mathrm{P}_j + e_{ij,t}$$

The baseline model utilises importer, Π_i, and exporter, P_j, fixed effects. Standard gravity model trade costs are included and as detailed by equation 3b. Fixed effects refer to the dummy variables equal to unity every time a particular exporter appears in the dataset. There is therefore one dummy variable for Cambodia as an exporter, another for France, another for Tanzania. The same approach is taken on the importer side. In the panel data literature, this approach is seen as accounting for all sources of unobserved heterogeneity that are constant for a given exporter across all importers (and indeed constant for all importers across all exporters). Theory provides a sound motivation for such an approach, as the GDP and multilateral resistance terms satisfy these criteria.

Establishing a baseline allows one to test the trade cost and size variables that are subsumed under a full set of fixed effects. This is important as the baseline is a way of identifying and comparing the ASEAN-centric covariate values to the expectations established in the literature. This is both an exercise of interest and a means of ensuring that the dataset conforms to established norms prior to running the model against new features in the form of the trade agreement indexes. Table 1.7 contains the estimated coefficients for the baseline testing under PPML.

In alignment with the proposition of the literature, the larger the size of a given trading partners market, as represented by home market GDP, the larger the associated volume of bilateral trade flows. As outlined by Tinbergen (1962), this relationship is the result of 'gravitational market forces'; the larger the market, the greater the consumer choice preference and the greater the need to trade to meet that preference. In the ASEAN context, a 1 percent increase in GDP is associated with an increase in bilateral trade flows of around 0.8 percent. The destination GDP elasticity is slightly lower than the origin which is in line with the findings of Feenstra et al. (2003) which identify the influence of home market effect. In addition, whilst the elasticity of both origin and destination GDP are below the parity predicted by theory, the results are in line with the meta-analysis findings of structural gravity estimations undertaken by Head and Mayer (2014).

Along the same gravitational lines, distance works to the contrary. The greater the distance between nations, the lesser the trade, and this is the quintessential trade cost barrier identified in early gravity model work (Tinbergen, 1962). In the ASEAN context, a 1 percent increase in the distance between nations is associated with a reduction in trade of 0.6 percent. This value is lower than the global average and represents the outward-looking export-orientation growth that has powered South-East Asian economies (Samphantharak, 2017). Such a growth model, set within the context of globalisation, has borne rapidly decreasing transport

and communication costs facilitated by a combination of technological progress and trade liberalisation (Krueger, 2004).

Table 1.7: Baseline PPML Gravity Testing

Variables	(1) Trade
Origin GDP	0.785***
	(0.000)
Destination GDP	0.781**
	(0.000)
Distance	-0.623***
	(0.000)
Contiguity	0.787***
	(0.000)
Common Language	1.019**
	(0.000)
Colonial Link	-0.449**
	(0.028)
PTA	0.320***
	(0.001)
Exporter FE	Yes
Importer FE	Yes
Observations	173,08
R^2	0.64

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at 5% level; (***) significant at 1% level.

In moving beyond distance as the primary trade cost, subsequent years of theoretical development have outlined four additional trade cost pillars of reference (Head and Mayer, 2014). The first of these, contiguity, is the binary representation of a common border between nations. As expected, the trade associated with a neighbour is boosted by around 54 percent. This stands to reason, as neighbours typically share both a closer cultural similarity, but they also have a natural advantage in the reduction of trade costs imposed by distance. Both features work together to promote neighbouring states as the natural trading partners.

In the presence of a common language, we can identify that trade is boosted by 177 percent. This is a reduction in the transaction-associated cost of trade negotiations conducted in foreign language. The commonality of language is theorised to enable a more seamless process of negotiation and ratification for trade liberalising policies and is highly beneficial during dispute negotiation.

In the case of ASEAN, the presence of colonial linkage is associated with a reduction in bilateral trade of 35 percent. This is in line with the work of Head et al. (2010) who identify that colonial separations lead to a reduction in trade between former colonies of the same empire and region. Over the course of the nineteenth century, Southeast Asia was colonised by Britain, France, and Holland. The opposite is found for PTAs. As expected, the introduction of a PTA is associated with a return to bilateral trade of 37 percent.

As noted, the process by which a PTA engenders increased bilateral trade flows is easily mapped. Two nations wish to engage in increasingly frictionless trade relations and this requires a contract that outlines the precise nature of the intended relationship, as well as the rules of engagement; given our trade intentions, what current impediments do we wish to address? Having spent time formulating, debating, and outlining the nature of the agreement, the contract comes into force and trade may continue in absence of some previous hurdles; trade therefore increases. As is immediately identifiable in such a narrative, the nature of a given trade agreement is therefore contingent on the intent of the signatories. There are of course universal commonalities, and some 'off-the-shelf' options, however, trade agreements are not all designed equal, and it is therefore important to identify how this 37 percent boost is informed by the details of the decree.

In order to get a clear sense of this, one must ensure a full set of fixed effects in line with the afore-discussed methodological standards. A full set of fixed effects allows testing of the direct relationship between preferential trade agreement design features, and the subsequent bilateral trade flows they empower. Accordingly, all non-trade agreement feature indexes are subsumed into the fixed effects; country-pair and time. The reason that the PTA index coefficient is not subsumed is because it is not a feature that is constant across all trading partners for one nation (such as GDP), nor is it constant across time for each nation (such as distance). The variation of application and time allows it to be tested independently of the rest. As such, the testing form, represented by model 4 below, sees all previous trade cost and size variables subsumed.

$$(4)\ \mathrm{X}_{ij,t} = c + \beta_1 \mathrm{PTA\_INDEX}_{ij,t} + \Pi_{i,t} + \mathrm{P}_{j,t} + \lambda_{ij} + e_{ij,t}$$

Fixed effects in this model are such that $\Pi_{i,t}$ represents country fixed effects for importer at time *t*, $\mathrm{P}_{j,t}$ is country fixed effects for exporter at time *t*, and λ_{ij} is a dyad fixed effect between importer and exporter. When scaled to country-time fixed effects, a dummy is assigned to Cambodia as an exporter in 1970 across

all importers, and another for Cambodia in 1971 across all importers. Accordingly, GDP is omitted due to collinearity.

Following the recommendation of Baier and Bergstrand (2007), utilising a full set of fixed effects delivers an empirically, and theoretically more suitable address to the issues of endogeneity and collinearity; providing consistent estimations of trade policy variables as they are, by proxy, varying across time and by partner. Resultantly, covariates that remain constant between trade partners are subsumed into the fixed effects estimation such as contiguity, common language, distance, and a colonial link.

Subsequent testing builds upon fixed effects estimation and utilises lag PPML at three and five years. This is in order to account for the reality that policy changes are rarely instantaneous and need time to imbed within an economy: p is the lag such that $\mathrm{X}_{ij,t-p}$ represents bilateral trade between countries i and j at time t minus the lag p.

In order to address the issue of reverse causality each index is additionally run with a three-year time lead. To ensure that the estimated values of PTA indexes are methodologically consistent and rigorous, it is important to ensure that there is no relationship present between untethered timespans. The introduction of a PTA in 2005 should have no influence on the trade values for the year 2000.

1.5.3. Individual Index Testing

The first stage of understanding the effect of PTA characteristics on bilateral trade flows is to establish the impact of PTAs on bilateral trade flows. Accordingly, Table 1.8 contains the measured impact of PTAs upon ASEAN bilateral trade flows, where the existence of a PTA between trade partners is proxied by a binary dummy. Our base equation is a slight variation on model 4:

$$\mathrm{X}_{ij,t} = c + \beta_1 \mathrm{PTA\_DESTA}_{ij,t} + \Pi_{i,t} + \mathrm{P}_{j,t} + \lambda_{ij} + e_{ij,t}$$

where $\mathrm{PTA\_DESTA}_{ij,t}$ is a dummy variable that takes the value one if there is a PTA in place between countries i and j at time t.

Immediately confirmed is the long withstanding insight that, on average, PTAs engender greater trade between signatories. This is no different for the ASEAN 10 and their bilateral trade partners. All coefficients associated with PTA are positive and statistically significant. Under country- fixed effects alone (Table 1.7), the return to signing a PTA is deemed to be an additional 37 percent. This figure drops to the general

literature expectation[40] of 14 percent once a full set of fixed effects are introduced. It is important to recognise that the boost to bilateral trade facilitated by a PTA is consistent between the average global trade partnership and the average ASEAN-centric trade partnership[41].

Table 1.8: The Effect of PTAs on Bilateral Trade

Variables	Trade *Index*	Trade $Index_{t-3}$	Trade $Index_{t-5}$	Trade $Index_{t+3}$
PTA_t	0.130***	0.131**	0.133*	-0.054
	(0.008)	(0.027)	(0.067)	(0.311)
Pair FE	Yes	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes	Yes
Observations	159,783	159,783	159,783	159,783
R^2	0.98	0.99	0.98	0.98

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at 5% level; (***) significant at 1% level.

In order to account empirically for the identified adjustment period for PTA conditions to take route within and throughout the economy, lagged analysis is conducted for three- and five-year periods. Under these conditions, PTAs are found to deliver a similar 14 percent boost to trade after three-years, and 14.2 percent after five-years. These increases in associated trade gains are in line with expectations. The power of the determined market liberalisation conditions within a PTA are not instantaneous changes and require a period of transition towards full adoption.

The importance of the ASEAN PTA elasticity cannot be underestimated. Given the longstanding proposition that PTAs engender greater bilateral trade flows, it is important to establish the extent of this relationship in the ASEAN context. Both for the validity of the aforementioned hypothetical propositions rooted in the literature, and for the establishment of the ASEAN relationship under robust testing.

[40] Similar to the results found in Santos Silva and Tenreyro (2006) and Dür et al. (2014).

[41] It should be noted that the estimated results in tables 1.8, 1.9, and 1.10, are capturing only the first order (direct) effects from the presence of an ASEAN-centric PTA. As such, the results may be interpreted as partial-equilibrium effects given that they do not capture the effect of change between world trading partners who are not signatories to a given trade agreement; for example, enhanced trade between signatory nations andd the resultant diversion of trade with non-signatory trading partners.

A three-year lead regression was also undertaken, whereby the independent index was given a three-year time lead such that $trade_t$ was regressed against $pta\_desta_{t+3.}$ This is primarily an address of the reverse causality issue in the gravity modelling of trade agreements. Under a time-lead there should be no significant relationship modelled in the dataset as the future conditions of market liberalisation between trading partners are not influencing the trade volumes of today. As can be seen in Table 1.8, the estimated relationship is statistically insignificant and minimal in magnitude.

Having established the value of PTAs to enhanced bilateral trade flows in the region it is appropriate to reintroduce our three core PTA characteristic indexes: *depth_rasch,* a weighted value of depth established using latent trait analysis and the specific application of the Rasch model; flex_ escape, an indexed measure of flexibility conditions that can be used by parties in the future to protect against unforeseen developments without breaching the agreement; and *flex_rigid*, an additive index consisting of eight key provisions that can be included in PTA's that determine the acceptable use of flexibility conditions; the constraints which are imposed on their use by a signatory.

The purpose of introducing such indexes is to develop a more nuanced perspective with respect to the primary drivers behind the enhanced trade flows. Until recent methodological forays into the classification of such agreements their inclusion has remained considerably underspecified.

Accordingly, each model is run utilising each index individually. Results tables contain the results for each index having been run systematically through the previously discussed econometric approaches: (1) a full-set of fixed effects; (2) full fixed effect with a three-year lag; (3) full fixed effect with a five-year lag; and, (4) full fixed effect with a three-year lead. Each Index is discussed in turn having undergone each of the four econometric forms.

The introduction of country-pair fixed effects serves to ensure a robust empirical methodology that deals with the core issues of endogeneity and collinearity. It ensures enhanced explanatory power for the influence of PTA characteristics as, by nature, they vary by time and partner. This is not the case for our traditional set of trade cost variables that are subsumed as collinear.

Beginning with the design features that determine the extent of market liberalisation between trading partners; depth conditions signal the intended future reductions in trade cost barriers both at the border, and behind the border with respect to policy harmonisation. They accordingly engender returns to bilateral trade as identified by both Dür et al. (2014) and Hofmann et al. (2017). This relationship is theorised to be the same for the ASEAN trade partnerships.

Table 1.9 contains the treatment effect estimations of PTA depth upon bilateral trade flows[42]. The use of a Rasch measurement of depth in a given PTA provides a robust measurement of depth inclusion in PTAs. As discussed in Appendix A2, a Rasch classification is a form of Latent Trait Analysis (Lazarsfeld and Henry, 1968), used for the analysis of categorical data. It is used to reduce a set of many binary variables to a small set of factors, called latent traits. Rasch analysis permits rating of a limited set of attributes that are representative of the underlying trait. The summed rating of the attributes represents how much of the trait has been mastered, since the raw score is the 'sufficient statistic' for the Rasch measure. Measurement represents the mapping of a group of predefined objects and their empirically observable relationship with a set of numbers; the Rasch score (Bartholomew et al., 2011).

Table 1.9: PTA Depth (Rasch Form)

Variables	Trade *Index*	Trade $Index_{t-3}$	Trade $Index_{t-5}$	Trade $Index_{t+3}$
$depth\_rasch_t$	0.088***	0.089**	0.092*	0.004
	(0.003)	(0.046)	(0.095)	(0.847)
Pair FE	Yes	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes	Yes
Observations	159,783	131,715	125,423	161,862
R^2	0.99	0.99	0.99	0.99

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at 5% level; (***) significant at 1% level.

In the context of bilateral trade, the Rasch score represents the level of depth of a given PTA as determined by both the number of depth-inclusions, as well as their relative influence. It is a methodological acknowledgement that not all conditions of depth are created equal and according classification should represent this. When regressed against *depth_rasch,* a 1 percent increase in depth is associated with roughly a 9 percent increase in bilateral trade flow. This increase is expected and in line with the results found in Dür et al. (2014). These results are also supported by the similar results from the regression of depth_index (see Appendix A5), where depth is estimated to increase with each additional indexed provision.

[42] As mentioned previously, Dür et al. (2014) provide two measures of depth in the form of an indexed classification depth_index (found in Appendix A5) and a latent trait Rasch estimation, depth_rasch (Table 1.9).

This characteristic estimation conforms to theory. Considering the depth of agreement; deeper PTAs necessarily include either a larger number of agreed conditions in total, or a greater number of deterministic conditions. Accordingly, member nations will undertake greater domestic market changes to ensure a more homogenised and transactable marketplace. The commitment mechanism of the PTA works alongside member market reform to facilitate greater bilateral trade flows between signatories. Depth conditions represent the extent to which market liberalisation will occur between the countries of the agreement. Further liberalisation facilitates greater trade through the removal of frictions and harmonisation of policies.

In addition, and as expected, the introduction of lags to the PPML specification addresses the intertemporal nature of PTA commitments contained in their conditions. Under the specification of fixed effects modelling with pooled data across consecutive years, trade is unable to fully adjust to changes in policy occurring within the same timeframe (Trefler, 2004; Cheng and Wall, 2005). Accordingly, the estimates exhibit greater returns to trade flow over 3- and 5-year establishments. Depth estimates increases in the ASEAN context are identified to be moderate and in line with the theoretical expectation. Regressed to ensure that the modelling has not suffered from the issue of reverse causality the estimated values are both statistically insignificant and low in magnitude.

1.5.4. Testing the Nexus

Beyond depth characteristics, this chapter seeks to understand the influence of both flexibility measures, and the conditions that constrain their use, as outlined by Baccini et al. (2015). There is an established relationship that outlines their positive association with depth, however their relationship to bilateral trade is little considered.

Theoretically, flexibility conditions and additional conditions that constrain their use, appear to be working to promote the long-term cooperation of all members in line with the goals of the agreement. This is achieved through the inclusion of conditions that allow for 'legal breach' of an agreement by a member to address pressing domestic issues such as a balance of payments crisis. Such a mechanism preserves the validity of the agreement and works towards greater future trade. Where there is a concern that an unscrupulous member may employ an information-asymmetric advantage with respect to a flexibility condition, the agreement builds in constraints that govern their acceptable use. As constraints on flexibility work to combat the asymmetry associated with the utilisation of a flexibility condition, they represent enhanced commitment to the principles of the agreement. They are important characteristics that protect against the 'acceptable-pause' of an agreement under unreasonable conditions, such as the whim of a new

political leader opposed to established relationships. This aims to ensure that all members have the same long-term parameters for cooperation and trade.

In terms of the results, it is of interest to identify the relative treatment effects of our three-tier conditions of influence: where the first tier is the adoption of a PTA in any form such that it is a binary inclusion; the second tier refers to the conditions of intent such as depth and flexibility; and the third tier concerns the conditions of use attached to the conditions of intent, such as the terms or action of a flexibility condition contained with an agreement. Having identified the treatment effect of depth individually, it is necessary to measure the effect of the characteristics together. This is premised on the established positive relationship between depth and flexibility, and constraints on flexibility and flexibility, as identified by Baccini et al. (2015). Appendix A6 contains the graphs for the ASEAN dataset used by this chapter that confirm this relationship. Individual testing of the flexibility conditions will be strongly influenced by the treatment effect of depth as the driver of trade facilitating pathways.

Accordingly, regressions were run to include both a measure of depth alongside measures of flexibility and the embedded constraints. They were run with a full set of fixed effects, and again with lags of three- and five- years and a lead of three years. Table 1.10 contains the results.

Table 1.10: Regression with Features of Depth, Flexibility and Constraints

Variables	Trade. *Index*	Trade. $Index_{t-3}$	Trade. $Index_{t-5}$	Trade. $Index_{t+3}$
depth_rasch	0.135***	0.154***	0.165***	0.019
	(0.006)	(0.000)	(0.000)	(0.822)
flex_escape	-0.027	-0.037*	-0.041	-0.010
	(0.192)	(0.077)	(0.104)	(0.224)
flex_rigid	-0.044*	-0.059**	-0.069*	-0.001
	(0.060)	(0.017)	(0.092)	(0.319)
Pair FE	Yes	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes	Yes
Observations	159,783	131,715	125,423	161,862
R^2	0.99	0.99	0.99	0.99

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at 5% level; (***) significant at 1% level.

It is immediately apparent that depth accounts for greatest influence within PTA design. Run in line with long-term flexibility and constraints, a one percent increase in agreement depth is associated with a 13 percent increase in bilateral trade. This enhanced contribution is even greater when lagged to account for the necessary market responses to take place: $depth\_rasch_{t-3}$ is estimated to boost by bilateral trade by 15 percent, whilst $depth\_raschx_{t-5}$ is associated with a 16 percent return. These results align more closely with those found by Dür et al. (2014) and further establish the importance of PTA design with respect to subsequent levels of bilateral trade.

The identified boost to the *depth_rasch* coefficient value can be attributed to the estimated negative effects of flexibility and the embedded constraint conditions. Whilst the presence of flexibility mechanisms, and the constraint conditions that often underline them, are theorised to retain long-term commitment to the agreement, their inclusion is equally symptomatic of the underlying issues that require the inclusion of flexibility provisions to begin. In their relationship with trade flows they may actually be proxying for the destabilising short-term political pressures that hinder trade, not the long-term stability that they are incorporated to ensure.

As can be seen in Table 1.10, flexibility, as proxied by *flex_escape* is associated with a reduction in bilateral trade flows of 2.7 percent, whilst constraints to flexibility conditions contribute a contraction of great statistical significance at 4.5 percent: this grows to 5.9 percent when adjusted for a three-year lag and 6.9 when adjusted for a five-year lag. It is important to note that whilst the results for flexibility strings are statistically significant, the coefficients for long-term flexibility are only significant under full fixed effects set within time *t-3*. All variables are insignificant when regressed with a three-year lead as is expected.

This negative effect is not necessarily surprising. Flexibility conditions allow for temporary suspension of certain obligations in a given agreement as determined by the signatories. They are included to mitigate against future domestic uncertainty and increase accordingly with depth: increased depth conditionality implies greater market liberalisation, which entails greater uncertainty with respect to domestic market requirements and facilitates future political pressures. Their inclusion is to weather against this future uncertainty (Fearson, 1998) and ensure the long-term viability of the agreement. However, in the short term, the ability to suspend the obligations of the agreement appear to erode the credibility and trade liberalising effect of the agreement (Rosendorff and Milner, 2001) as nations undertake protectionist measures to address political discontent.

One might have expected constraint on flexibility measures to constrain the issues by introducing conditions of action. However, inclusions of this kind are symptoms of the time-concern issue that

undermine the full potential of trade agreements. Similar results can be seen in Appendix A7 for where *depth_index* is used instead of *depth_rasch.*

The testing of depth, flexibility, and constraint conditions has identified that their inclusion influences the level of bilateral trade flows. The specific magnitude and direction of this influence is however contingent on the circumstantial context of signatory nations, timeframe of implementations and intentions for future trade realisation.

This is perhaps unsurprising. Depth is expected to be the key catalyst and driver of bilateral trade flow gains. Flexibility conditions, by comparison, were introduced to ensure the long-term viability of trade agreements in the face of short-term political requirements by individual states that would have seen abrogation of the agreement in their absence. Their positive association with depth represents the relationship between increased depth and increased future uncertainty. Perhaps over long horizons they engender trade through the preservation of a given trade deal, but in the short term, flexibility conditions allow nations to temporarily withdraw from the obligations of an agreement to address predominantly projectionist domestic requirements. Resultantly, trade flows are hampered.

1.6. Conclusion

The insights of this chapter serve to reinforce the growing literature that asserts the significant importance of PTA characteristics in determining the bilateral trade flows. It is commonly accepted that the adoption of an average PTA will engender boosts to trade; measured at an average economic significance around 43 percent (Head and Mayer, 2014). This chapter has found a broadly similar impact of ASEAN PTAs between 14 and 37 percent depending on methodology and classification. The lower value aligns with the literature findings on enhanced specification PPML gravity models (Dür et al 2014).

This of course represents the insight of an average effect associated with an absence of afforded consideration to design difference. In order to account for the variance in purpose and design, the aforementioned DESTA indexes on depth and flexibility were utilised in a gravity framework to identify the average effect of PTA deign on bilateral trade flow.

In line with the work of Dür et al. (2014), depth of agreement is identified as a significant determinant of trade flows. Looking back at the results tables, one can identify that depth estimates are both statistically and economically significant in their determination of bilateral trade flows. Under the most robust specification of PPML with a full set of fixed effects and a lagged index form, a 1 percent increase in the depth of a PTA, as modelled by *depth_rasch*, is associated with an increase to trade of 9 percent.

Whilst the positive determination of PTA depth design is consistent throughout testing, when indexes are measured simultaneously flexibility and constraint on flexibility measures reveal a negative relationship. Both of these observations fall in line with the theoretical assertion that PTA design is a deterministic feature of trade. An index for depth proxies for a given agreements commitments to trade barrier reduction and policy harmonisation, whereby the more conditions, and indeed the more significant conditions, are associated with reduced trade costs, and greater market harmonisation between trading partners. Accordingly, trade would be predicted to increase between signatories.

By contrast, ‘safety valve’ provisions appear to undermine the credibility and trade liberalising effect of the agreement by providing signatories an easy suspension of agreement defined responsibilities.

The potential for undermining by flexibility conditions are purportedly regulated by incorporated flexibility-strings that govern their acceptable action. Agreements with such provisions are theorised to work to acknowledge sovereign requirements and hereby promote long term commitment through the mechanisms of partnership, cooperation, and respect. Whilst this may be the case, the direct relationship

with trade is also negative, suggesting that they do little to moderate the unintended trade effects of flexibility.

The results do however point to the fact that the design of PTAs matters significantly for the determination of bilateral flows. The logic herein forms part of the acknowledged underpinning drivers to ASEAN relationship development and trade agreement formation.

These insights develop an enhanced understanding of the role of trade agreements in shaping bilateral trade relationships over the previous 68 years in the ASEAN region. The specific characteristics of PTAs are identified to be significantly important with respective to the specific magnitude of economic benefit under a given PTA.

The ASEAN region continues to grow in its significance and influence with respect to global economics and politics. Understanding the drivers of a key mechanisms in its economic development is crucial in the ability to make informed recommendations regarding future relationships and trade policies, whilst shedding enhanced light on past and current ones.

It is clear from this study that PTAs have played a key role in ASEAN development, in line with the global experience. Where the determinants differ is in respect to the reduced significance of economic size, and the enhanced importance of distance, common language, and colonial ties. Traditional trade ties developed regionally and in line with geographical and historical connections. The adoption of PTAs has been a way to broaden global reach and will form an increasingly significant role moving forward as numerous ratifications with the EU and EFTA start to come into place.

In the pursuit of further developed insights on this research topic, it is important to note that a new generation of average treatment effect estimators have been proposed in the literature (de Chaisemartin and D'Haultfœuille, 2020). Specifically, a difference-in-differences (DID) estimand that identifies the effect of a given treatment (a PTA in the case of this paper) in the group that switch treatment, at the time when they switch. This estimation methods addresses issues associated with an unrealistic assumption of 'common trends', whereby the treatment effect is considered constant between partners across time; thus, leading to misspecification. As this estimation method was published post-writing of this chapter it can be considered a logical next step in preparing the chapter for standalone publication.

2. The Effect of Non-Trade Inclusions on Bilateral Trade Flows.

2.1. Introduction

As of 2017, over 50 percent of global bilateral trade was taking place under some form of preferential trade agreement (UNCTAD, 2019). These agreements increasingly incorporate conditions that go beyond the traditional market access and trade liberalising agenda (Chauffour and Maur, 2011). Typical non-trade inclusions (NTIs) governing the domestic regulation of environment, labour, and civil-society have become common-place PTA features over the past two decades (Lechner, 2019). Such standards are not directly related to trade (Jones, 2002; Limão, 2007), and mandate that states make efforts across their domestic procedural and legislative space. Despite their proliferation, their full impact on trade flows remains unclear.

Literature-bound explanations for the incorporation of NTIs have explored a wide range of motivations, from protectionist concerns (Bhagwati and Hudec, 1996) to the domestic response of policy makers to the characteristics of potential trade partners (Lechner, 2016). From an issue's linkage perspective (Spagnolo, 2001; Leebron, 2002), NTIs present a case study on the trade-tool development of strategic versus norms-based guidelines. For example, it may be that environmental standards are developed around the pursuit of an intended outcome set such as the reduction of carbon emissions. This would be a strategically motivated condition. Whereas civil and political right inclusions, as asserted by Lechner (2016), are more often established to ensure conformity to a set of established standards. This would represent a norms-based approach. Owing to the different motivational structures, one would theorise that the trade impact of a given NTI would be rooted in the justification of its employment.

Indifferent of their underlying motivational structure, one universal commonality to their inclusion concerns the unbalanced interplay between HI nations and their middle-to-low income (MTLI) trade partners.

Beginning in the 1990s, two HI groupings, the EU and the United States, began to formalise the standard incorporation of NTIs within their trade agreements (Jones, 2002; Aaronson and Zimmerman, 2006; Limão, 2007). Aided by the stall of multilateral negotiations under the WTO) during the Doha round, PTAs have become the vehicle for exporting social regulation (Postnikov, 2018). It is therefore theorised that NTI inclusions have a greater effect on MTLI nations than HI nations. This is predicated on the note that HI nations have a greater regulatory alignment across non-trade features such that their inclusion in a trade deal will require minimal disruption to the status quo operating procedure. By comparison, the requirement

for MTL nations to adopt the preferred regulation framework of a HI trade partner is likely to entail greater costs.

However, the extent to which NTIs cause a negative domestic effect on a given MTLI nation is contingent on the total trade and investment that the incorporation of these new conditions can achieve. Afterall, the primary motivation for an MTLI nation to sign an agreement is the pursuit of enhancing trade flows and leveraging upon a combination of domestic comparative advantage and a greater market base to improve the national trade income flows (Stender, 2019).

For HI nations, market access remains a key motivation to the decision-making process for the signing of a trade agreement. However, HI nations are additionally able to utilise trade agreement frameworks to mandate for their trade agreement partners to develop their domestic markets in line with preferred practice (Lechner, 2016). It is therefore no surprise that the growth of NTI inclusions has concentrated around agreements involving at least one MTLI nation (Berger et al. 2018). There are, by comparison, relatively few NTIs adopted across agreements between MTLI nations. The preference structure in traditionally termed south-south agreements has tended to focus on standard economic linkage development in order to pursue enhanced trade flows (Shirotori and Molina, 2009)

From a global standards perspective, recent research has identified that the inclusion of NTI provisions facilitates the potential to contribute to areas such as environmental sustainability (Martínez-Zarzoso and Ouslati, 2016; Zhou, 2017; Berger et al., 2018), labour-law enforcement (Häberli et al., 2012; Artuso and McLarney, 2015), and civil-society development (Orbie et al., 2016). From a globalist perspective the achievement of harmonised non-trade standards gives way towards the level of integration that offers a greater variety of less expensive goods (Yates and Murphy, 2019).

However, from an economic competitiveness perspective there is a concern that non-trade provisions can reduce trade flows and undermine a countries' competitiveness (Baccini et al., 2015; Berger et al., 2018). A vivid illustration of a non-trade inclusion undermining the competitiveness of an MTLI nation is the imposition of labour laws. An MTLI nation's trade advantage is often derived in the early stages of trade relationships from an abundance of competitively priced labour (Porter, 1990). An NTI requiring enhanced labour protection mechanisms, such as a minimum wage or union representation, will erode this advantage if the cost of adherence renders labour resources resultantly non-competitive; such that the labour cost advantage is lost as unit cost increases.

Despite these valid concerns for competitiveness, studies exploring the real effects of NTIs remain limited and with a predominant focus on environmental outcomes (Berger et al. 2018). This chapter therefore addresses this gap by utilising a nuanced NTI dataset developed by Lechner (2016) to measure the global average treatment effect of NTI inclusions on bilateral trade flows.

Lechner's (2016) dataset provides a fine-grained classification of the three core NTI inclusions – environment, labour, and civil-society – defined at both the extensive margin (the number of provisions per agreement) and the intensive margins (the legal enforceability and mandate for the inclusions). Utilising the gravity model for trade, the 'workhorse' of trade flow measurement, this chapter shines light on the trade relationship between 'revenue and responsibility', thus answering the question, 'to what extent do NTI inclusions affect trade flows?'.

In addition to trade impact, this chapter additionally addresses the question of 'principled protectionism' and whether or not this is a valid concern for developing nations. To achieve this, separate regressions identify the impact of NTIs on developed nation bilateral trade flow partnerships, developing nation bilateral trade flow partnerships, and developed-developing bilateral trade flow partnerships.

The remainder of this chapter is structured as follows: section 2.2 provides a review of the NTI literature and outlines this chapter's hypothesis about the economic effects of NTI conditions in PTAs; section 2.3 then discusses the gravity model as the methodological approach for this chapter; whilst section 2.4 contains a description of the dataset and presents the findings of the testing and provides a discussion on the implications and relation to the literature; and, finally, section 2.5 concludes and rounds up the contributions of the research to the literature.

2.2. Literature Review: Preferential Trade Agreements and the Inclusion of Non-Trade Issues

PTAs consist of a body of rules and practices that govern the trading relationship between two or more signatory nations. Primarily, a PTA seeks to increase market access and trade by reducing artificial tariff and non-tariff trade barriers. Increasingly, however, under the motivation of developed states[43] PTAs are also outlining conditionality that goes beyond the scope of direct-trade promotion. These NTIs[44] extend beyond scopes typically covered under the multilateral trading system and provision for the expected standards, institutions, and mechanisms governing domestic features around the scopes of human rights, environmental standards, and civil-society participation (Jones, 2002; Limão, 2007; Hafner-Burton, 2009; Vogel, 2013; Lechner, 2016).

The move to incorporate NTIs, and extend the coverage of PTAs beyond trade, was catalysed in the 1990s when several trade agreements expanded their scope: these included NAFTA (1992), the Cotonou Agreement (2000), and the US-Jordan Free Trade Agreement (2001) (Jones, 2002; Limão, 2007). The standardised incorporation of such conditions was subsequently formalised by the EU in 1995 and followed by the United States in 2002 (Aaronson and Zimmerman, 2008).

Whilst the enduring utilisation of NTI conditions began 25 years ago, the primary focus of the literature has been limited to developing the understanding of NTI characteristic development and the substance of the provisions (Vogel, 2013; Postnikov, 2014). Any development beyond the motivations has tended to focus heavily on the implications for the environment and domestic legal systems (Baghdadi et al., 2013; Bastiaens and Postnikov, 2017). Whilst the inclusion of NTIs in PTAs is increasingly prominent, there are relatively few studies that empirically investigate their economic consequence[45]. Accordingly, this section of the chapter first outlines the catalysts for, and interplay between, PTAs and NTIs. It then explores the competing theoretical deliberations, as to the motivations and implications of NTI inclusion, and how these impact upon the bilateral trade flows that the PTAs themselves govern.

[43] NTI conditions have been primarily developed within trade agreements as a result of the approaches taken by the EU and the United States (Aaronson and Zimmerman, 2008; Postnikov, 2014).

[44] Whilst there are features of these categories that are related to trade, their inclusion is primarily concerned with the promotion, development, and institutionalisation of quality standards.

[45] A key exception is a study by Lechner (2019) on the treatment effect of environmental and labour standards on US investor practice, but finds the effect varies across sectors.

2.2.1. PTAs and Trade

The economic impact of NTI conditionality is rooted in the function of preferential trade agreements and their increasing role in governing the practices around international trade. To this end, PTAs are a tool for the partial liberalisation of international trading barriers as an exemption to the MFN provision of the WTO[46] (WTO, 2019). As outlined in Chapter one (section 1.2) the rapid increase in their adoption since the 1990s shows no sign of abating as nations continue to negotiate and ratify PTAs (UNCTAD, 2019). As seen in Figure 1.2, with only 28 agreements in force in 1990, there are now 302 physical trade agreements in force and ratified by the WTO, with a further 38 early announcements (WTO, 2019).

As noted, the proliferation has been the result of two key motivations. The first motivation resides in the ailing state of the Doha Round of trade negotiations that resulted in the stall of multilateralism (Baldwin and Freund, 2011). Consequently, regionalism and the proliferation of PTAs emerged in its place. This emergence was itself predicated on the second key motivation. This was the suitability that PTAs present with respect to their denomination as a 'fit-for-purpose' trade arrangement, where the rules of engagement may be determined by the ultimate ambitions of the group (Low, 2014). Preferentialism, therefore, provided a flexible trade mechanism that can be designed to intuitively afford the necessary consideration for individual domestic signatory requirements.

In addition to their contextual suitability, those in support of PTAs theorise that the removal of trade barriers will ultimately facilitate an aggregate level increase in welfare for the parties involved (WTO, 2011). The reduction in the artificial costs associated with trade barriers is expected to facilitate a greater availability of, and reduction of cost in, goods and services; ultimately stimulating the respective partner economies (Baccini et al., 2015). The common finding from the empirical research in this area has been that PTAs often tend to increase trade between their members (Baier and Bergstrand, 2007, 2009; Egger et al., 2011; Freund and Ornelas, 2010; Dür et al., 2014). The boost to trade can be associated with a number of features including the enhanced participation within global value chains, the promotion of partner cooperation, and the value of lower trade barrier access on imported goods (the consumer welfare and market choice) and exported goods (national income boosts) (World Bank, 2020). In addition, and from the perspective of

[46] MFN treatment describes the commitment to parties of the WTO to not discriminate between their trading partners. For example, if nation A grants a lower customs duty rate to nation B on rice mill, then they must also provide that lowered rate to all other trading partners for this product. It is a guiding principle for multilateral trade and outlined in article one of the General Agreement on Tariffs and Trade (GATT), article two in the General Agreement on Trade in Services (GATS), and article four for the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) (WTO,2019).

investment and trade stability, PTAs also provide the rules and regulations necessary for begetting a predictable policy environment (Chauffour and Maur, 2011).

In theory, and on balance, trade agreements have the potential to engender both trade creating and trade diverting effects (Panagariya, 2000). Trade creating effects are seen where the introduction of a PTA restructures the supply chain towards a more efficient producer of a given good within the agreement. By comparison, trade diversion is the reallocation of trade away from a more efficient supplier that is located outside of the agreement, and towards a less efficient supplier within the agreement (Magee, 2008). Due to the multi-good exchange nature of a typical PTA, the trade effect will generally induce both trade creating and trade diverting characteristics. It is therefore the net effect that is best assessed when determining the viability of a given agreement (Muhammad and Yücer, 2010). This net effect accounts for both trade and non-trade features of the agreement.

Beyond facilitating market access, PTAs are utilised for their suitability at setting the rules of engagement (Limão, 2016). Increasingly, this has resulted in PTAs stepping beyond the purely trade-outcome concerned liberalisation criteria, and into the rules and standards that seek to characterise the total engagement (Lechner, 2016). Given this, and the already extensive coverage of trade agreement effects[47], recent research efforts have begun to focus on the differential trade effects that PTAs have across various sectors (Baccini et al. 2015). Additionally, and facilitated by the availability of new datasets covering the design of PTAs (Dür et al., 2014; Lechner, 2016; Hofmann et al., 2017), there is an increasing focus on whether the trade effects of PTAs vary according to their design; the trade agreement-architecture and trade nexus.

Trade agreement design is most commonly captured as representing the level of depth an agreement (Dür et al., 2014); where depth concerns the number of areas covered and the legal enforceability of the respective conditions (Hoffman et al., 2017). Empirical studies in this area have shown that deeper PTAs, on average, generate greater trade than their shallower counterparts (Baier et al., 2014; Dür et al., 2014; Mattoo et al., 2017). Where a PTA is deeper it has comparatively fewer trade barriers in place between the parties to the agreement, encouraging and facilitating a greater volume of trade flow (Dür et al., 2014). Following the trade-literature development on design, there has been the emergence of a second and distinct strand of literature exploring the nature and implications of non-trade issues in PTAs (Lechner, 2016, Milewicz et al., 2016; Berger et al., 2018).

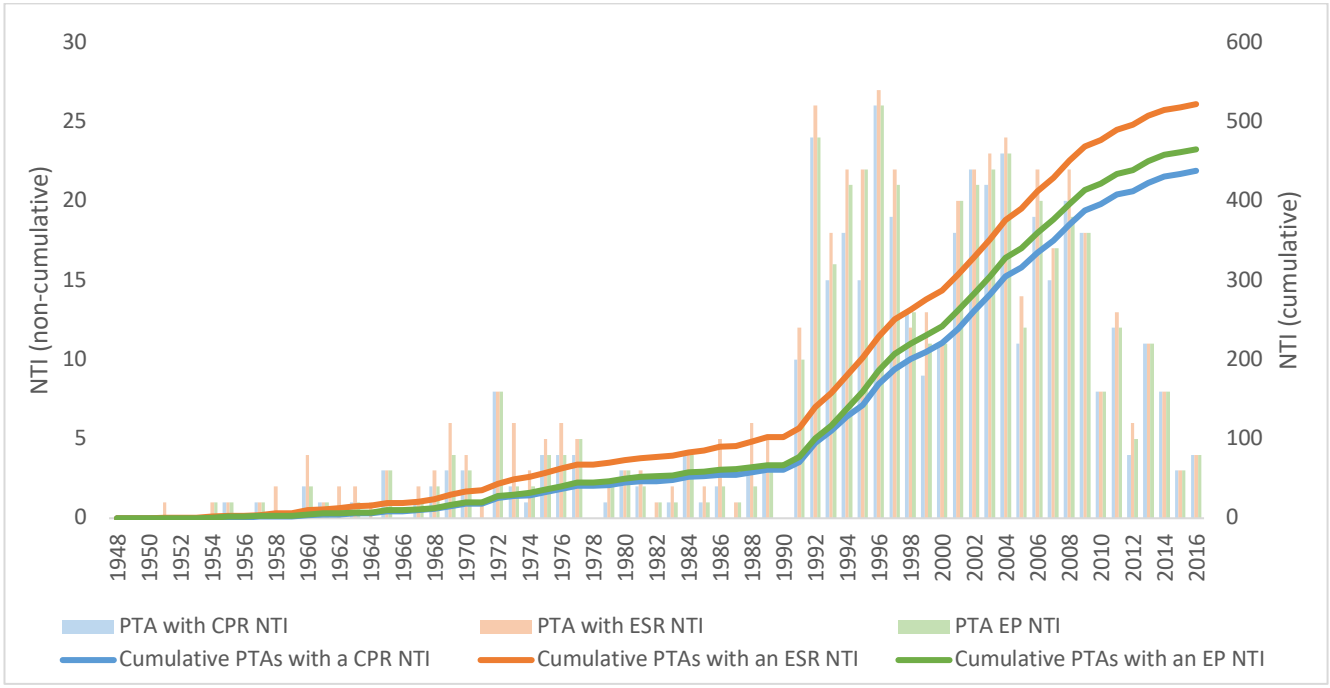
[47] A considerable number of empirical studies and discussions have looked into the economic effects of preferential trade agreements (Anderson and van Wincoop, 2003; Baier and Bergstrand, 2006; Limão, 2006; Head and Mayer, 2014; Yotov, 2016).

2.2.2. NTIs. Proliferation and Motivation

NTI conditions are the accepted protocols for parties of a given PTA to adhere to on governance and standards issues; commonly covering civil and political rights (CPRs), economic and social rights (ESRs), and environmental protections standards (EPs). The now frequent incorporation of NTI conditions was catalysed by the United States and the EU in the 1990s (Postnikov, 2014). This can be seen in Figure 2.1 at the inflection point of 1990. Until then, the adoption of NTI clauses was a feature that primarily concerned the fair treatment of labour.

Vogel (2013) proposed that the failure to press for social clauses in the WTO encouraged the United States and the EU to enter into bilateral trade agreements, where their power supremacy allowed them to shape PTAs according to their needs and values. This sentiment is echoed within the human-rights literature, where it is identified that the predominance of developed nations enables larger states to incorporate tough human rights clauses in their PTAs (Hafner-Burton, 2009). This power-leverage proposition is further promoted as being a crucial mechanism for stipulating human rights in trade agreements by Aggarwal and Govella (2013). However, as noted by Lechner (2016), power is a relative inclusion. Despite notably equivalent power leverage over trading partners, the EU and the United States incorporate different levels of clause and different NTI inclusions.

Figure 2.1: NTIs in force (by year of PTA entry into force), 1948-2016



Source: Lechner (2016)

Hafner-Burton (2009) has proposed that the design of NTIs reflects policy makers preferences, but that this preference is dictated by the institutions through which they compete for decision-making influence and the countries' relative market power. He gave the example of left-leaning governments pursuing stricter NTI clauses, in comparison to conservative power bases who remain reluctant to do so. Where institutions and civil society enter the picture, Postnikov (2014) identifies that the United States insists on stricter social clauses than the EU, despite the equally strong lobbying by civil society institutions for both powers. This contrast is a result of the difference in access between lobbyists and decision makers between the United States and EU approaches. In the case of the United States, pro-social-clause activists are given greater access to PTA designers. Despite the case that can be made for power dynamics Lechner (2016) is able to identify through cross-year comparison, that power may be able to explain design variation over time, but do not do an adequate job when it comes to explaining design over the same year with the same partner.

This can be explained by 'relative-engagement', where larger powers have greater power to push for NTI inclusions; but only so long as the push does not derail access to the resource flows that the PTA is designed to govern. It is also comparative to the interest of the trading partner, and their relative domestic institutions as to whether they have the necessary desire or capacity to make the changes. Therefore, one must consider both the characteristics at home and in the partner country to explain the variation in PTA design (Aggarwal and Govella, 2013; Hafner-Burton, 2009; Milewicz et al., 2016).

Accordingly, partner-power dynamics form the determining force behind the successful promotion and adoption of NTI inclusions. The strongest partner in the agreement outlines and incorporates the NTI inclusions based on their preferences and pressures; whereby NTI conditions are in part determined domestically by special interest groups that identify and articulate their concerns regarding unfettered market access. For example, business lobbies concerned about a loss of competitiveness (Postnikov, 2014), or a civil-society body concerned about the environmental impact of increased production in a nation with lower environmental standards (Berger et al., 2018). At the same time, the 'weaker' signatory decides based on perceived market access, economic benefit, and political aspiration (Hafner-Burton, 2009). From a preference perspective, inclusions may align with domestic market rules that lower the transaction cost of incorporating different or divergent standards. From an NTI perspective, one recognises that regardless of motivational structure, such conditions provision for the establishment of a set of standard ethical rules. As noted by Felber and Hagelburg (2017), ethics in the international trade space represents abiding by the fundamental values guiding society such as human dignity and sustainability.

In addition to the catalysts and drivers behind NTI conditionality, it is important to consider the competing motivations at play in determining their inclusion. To understand the interplay between NTIs and trade it

is important to explore what these motivations are, and how they are expected to play out. There are three broad classifications of NTI motivation: protectionism, quality standards, and the pursuit of a shared ethical vision. Each one is discussed in turn with a view to understanding the trade outcome for NTIs.

Protectionism

Perhaps the best discussed explanation for the inclusion of non-trade issues is that of protectionist concern (Bhagwati and Hudec, 1996; Krugman, 1997). The use of NTIs in PTAs, such as labour protection laws or environmental standards, can in theory be used to restrict imports from yet-to-be compliant parties to the deal (Berger et al. 2018). The accusation follows that such inclusions are therefore a cover for the protectionist interests of HI nations as they exploit their power dynamics to shape PTAs to their needs (Vogel, 2013).

There are two key sides to the protectionist outlook: domestic market protection and partner market restriction (Bhagwati and Hudec, 1996). The former regards the domestic market concern that the removal of trade barriers will lead to market disruption as cheaper alternatives flood the market. The use of an NTI condition addresses this by imposing a greater standards requirement on a middle-to-low-income[48] (MTLI) trading partner such that the costs involved to adhere to the PTA ensure domestic market competitiveness. By comparison, the latter consideration of partner market restriction describes the circumstance where NTI provisions are used to directly restrict the competitiveness of partner countries. Whilst the motivations differ between the approach, the outcome is of the same mould; maintaining market competitiveness in the HI trade partners.

As alluded to, the imposition of an artificial cost on middle-to-low-income markets is aimed at the reduction in the cost and scale advantages of an underregulated developing market. According to the Stopler-Samuelson theorem (Chipman, 1969) and the *logic of the race to the bottom* (Krings, 2009), labour in a developed world would be negatively affected by the opening of trade relations with member states from the developing world. As is the standard theory in economics, competition is expected to lower prices, , which diminishes the return on whatever factor is used most intensely in production; in this case, the most commonly affected factor of production is workers (human capital). This is owed to developing nations holding a competitive labour-advantage resulting from weaker institutional protection mechanisms such as working hour directives, labour unions, or minimum wage. As a result, labour groups in the HI nation have

[48] This chapter roots its two-part classification of nations in the World Bank's categorisation of nations relative to their national income levels. HI nations have a GNI per capita greater than $12,375, whilst middle-to-low-income (MTLI) nations have a GNI per capita below $12,375. MTLI classification covers all nations categorised as low income, lower-middle incomes, and upper-middle income.

an incentive to inspire the fear of downward wage pressures compounded with a fall in the standards of production (Bhagwati and Hudec, 1996; Krugman, 1997). This pressure can be translated into direct action by HI nations as a result of their *power supremacy* (Vogel, 2013).

These protectionist concerns are themselves motivated by the market incentive to maintain competitiveness and consistently grow income, either through greater market penetration or higher cost goods (Glueck et al., 1980). Herein, HI nations, in particular the EU and United States (Postnikov, 2014), have been able to utilise their power supremacy to shape PTAs to their needs (Hafner-Burton, 2009). Accordingly, middle-to-low-income states have reason to believe that NTIs represent the self-interest of HI countries to ensure 'principled protectionism'[49], such that a developing nations competitive advantage is limited by the imposition of non-trade regulatory requirements.

As such, the antithetical incorporation of protectionist motivated NTI clauses within the trade liberalising framework of a PTA strikes up artificial trade barriers that are theorised to reduce trade and investment (Business Europe, 2014). Such motivations are theorised from this perspective to have worked alongside global power dynamics to facilitate both the deepening, and increased inclusion of, NTIs in preferential trade agreements. It may thus be expected that the inclusion of NTI conditions will have contributed trade-reducing effects. This negative effect will be more pronounced where there are more NTI provisions in the PTA, or the NTI provisions have greater legal enforceability. As described by Sykes (1999), the utilisation of a PTA to ensure domestic market protection against a foreign rival is a form of regulatory protectionism; an umbrella term to describe a wide array of policy instruments that can protect domestic firms against foreign competition. Such inclusions are considered "exceptionally wasteful protectionist devices" (Sykes, 1999) with respect to the trade flows that they inhibit. It is therefore expected that the NTIs will impede a developing countries' market capture in their developed counterpart as the competitive advantage they hold depends, inter alia, on a weaker regulatory environment (Bhagwati, 1994). They may however see that over a longer time horizon they are compensated by greater market access.

Theories on protectionism contain reasonable assertion towards explaining an expected and non-preferable outcome for developing markets. However, they overlook the fact that the signing of a PTA is an act of trade liberalisation between the partners to the agreement. The primary reason for protectionist sentiment contained in the agreement rests on the stakeholder mix at the time of decision making. Where there are vested interest groups who seek to minimise the potential impact of an undercutting competitor, there are

[49] The term principled protectionism is motivated by the literature covering regulatory protectionism (Sykes, 1999), and the discussion of 'green protectionism' in the environmental literature (Berger et al., 2018).

inclusions that can be made to level the playing field[50]. Regardless of the structure of the agreements NTI conditions, the signing of a trade deal opens new market opportunities; either for previously non-trading sectors, or under increasingly liberalised conditions.

Labour Standards

A second motivation for the inclusion of NTIs within a PTA framework falls into the standards category, whereby nations pressing for the inclusion of NTIs are seeking to ensure quality standards from the partner countries that they trade with. This forms a departure from the protectionist sentiment from the perspective that the inclusions are not motivated by a desire to protect (inhibit) domestic (foreign) market performance. Instead, they are for the purpose of promoting the adoption of standards for the benefit of people, environment, and process, for the purpose of ensuring that goods traded meet the requisite standards within the production chain. As noted by Peacock (2016), in addition to appeasing domestic audiences, a nation's incorporation of NTIs seeks to avoid competition on regulatory standards.

A considerable portion of PTAs now include labour standard provisions with varying degrees of enforceability (Lechner, 2016). Such trade agreement inclusions generally cover the majority of the ILO core labour standards: including freedom of association, the right to form unions and bargain collectively, limitations on child labour, and the elimination of forced labour (Artuso and McLarney, 2015). In addition, some agreements incorporate standards covering minimum wages, working hours, and occupational health and safety (Stern and Terrell, 2003; Artuso and McLarney, 2015).

The adoption of labour standards in the PTA framework is perhaps unsurprising. The failure of the WTO to adopt a clause on economic and social rights during multilateral negotiations in the 1990s is seen by many scholars as a rejection by developing nations to the 'over-conditionality' of their developed counterparts (Carrère et al., 2017). The fear from middle-to-low-income nations during the negotiation rounds was that HI nations were implementing protectionist mechanisms to dampen competitiveness through the imposition of labour rights (Wet, 1995). The emergence of such inclusions in the bilateral and regional toolkit has therefore piqued the curiosity of scholars who felt that their time had come and gone, as marked by the multilateral failing (Artuso and McLarney, 2015). Accordingly, critics and advocates have increasingly debated the theoretical nature of the link between NTIs covering labour standards and trade. However, in contrast to the considerable literature discussion on standards covering environmental and human rights features, labour rights have typically remained under-discussed and empirically undertested

[50] For example, if garment manufacturers in the UK are expected to adhere to environmental standards that Vietnam does not have, then the inclusion of an NTI condition stipulating the same rules be followed helps to assuage the fears.

(Raess and Sari, 2018). Where there has been study, the majority have tended to focus on single case application where a specific condition has been discussed in a comparative case study relative to its outcome (Nyland and O'Rourke, 2005; Giumelli and van Roozendaal, 2016). Studies have instead focused on the circumstance of inclusion and outcome of the main players in the determination of PTA rules; the EU and the United States (Hafner-Burton, 2009; Kerremans, 2009). Of these studies, the general conclusion has related to the enforceability of the conditions as opposed to the trade implications of their inclusion (Artuso and McLarney, 2015). For example, United States' trade agreements incorporating labour standards have proven to be more enforceable than their EU counterparts (Bastiaens and Postnikov, 2014). The first extensive comparative analysis of such conditions was undertaken by the ILO (2009) in their *World of Work Report.* It focused on the design and effectiveness of labour provisions in trade agreements, but crucially did not discuss the outcome for trade flows or volumes.

As framed by Salem and Rozental (2012), the argument at its core is whether labour NTI conditions result in a dampening of market competitiveness. One may imagine that in response to conditioned requirements, developing countries will end up raising the working standards for their workers and result in the risk of losing their comparative market advantage of lower production costs for goods with a higher requirement for labour. Advocates of trade-linked labour standards aim to halt a race-to-the-bottom of labour standards, whereby national practice is reduced with the express aim of depressing production costs for the purpose of procuring an export advantage and expand international trade and competition (Chan, 2003); where sub-standard working labour conditions are in practice, the wages of workers are artificially suppressed (Maskus, 1997).

In favour of their inclusion, labour unions in developed countries have argued that a broad range of labour standards can be distorting, particularly if the level of enforcement differs among countries. Lower or poorly enforced labour standards can provide a country with an unfair international competitive advantage (WTO, 2011). Accordingly, the sub-standard labour practice in developing countries can be a cause of job losses in developed countries (Bakhshi & Kerr, 2009). Such is the strong motivation for the EU and the United States to ensure such inclusions.

The use of these NTI standards would therefore be expected to level the playing field between developed and developing nations because they require all signatories to ensure an acceptable level of labour working conditions. This hereby eliminates a labour-driven source of unfair economic advantage (Salam and Rozental, 2012). However, in order to ensure that the inclusion of labour rights conditions does not unfairly harm a developing nation in favour of a developed one, efforts have been made to identify and achieve consensus on a group of core labour standards that should ideally apply universally (Stern & Terrell, 2003).

In the empirical literature on the matter, Häberli et al. (2012) identified a positive relationship between higher labour standards and economic output performance in developing nations[51]. Signatory nations increasingly consider that economic development is contingent on social development in the long run (Häberli et al., 2012). There is resultantly a common desire to cooperate so that economic opportunities can be translated into the development of human resources and improvement in working and living conditions of all countries (Häberli et al., 2012). This fundamental debate for the incorporation of labour standards in developing countries looks at the impact of increased competitiveness and shows that the inappropriate application of core-labour standards generally reduces competitiveness through labour-market distortions (Martin and Maskus, 2001). From an HI nation perspective, where these distortions are addressed in middle-to-low-income nations, the economy witnesses an increase in productivity and a reduction in the real costs of contracting workers in developed nations (Grandi, 2009).

As noted by Young (2015), the development of social standards takes time. It is unlikely that a trade agreement containing conditions for the improvement of social conditions will yield direct economic improvements in the short run (Singh and Zammit, 2000). However, the market access conditioned by the agreement provides a platform for developing nations to grow economic trade, whilst the address of labour standards improves incrementally leading to more equitable growth. This argument is made clearly in the environmental literature on NTI conditions and trade.

Environmental Standards

The predominant outcome theories in the environmental-trade literature primarily discuss how export competitiveness has affected environmental regulation and innovation (Costantini and Mazzanti, 2012). Whilst there is an obvious and often-discussed regulatory cost associated with environmental protection (Butler, 1992), the Porter hypothesis contends that environmental policies may in-fact foster international competitiveness by inducing technological innovation (Jaffe et al., 1995; Jaffe and Palmer, 1997; Porter and van der Linde, 1995). This is bolstered by the discussion of the neo-Schumpeterian conceptual framework of technological regimes applied to economic sectors (Malerba and Orsenigo, 1997; Breschi et al., 2000).

From an environmental perspective, the relevancy of both theories is based in the relationship between economic and environmental performance (Manrique and Martí-Ballester, 2017). In this sense, innovation and environmental policy are considered to contain a crucial intersection necessary for decreasing the use

[51] The study utilised six different outcome-based measures for labour standards in developed countries including the percentage of total public expenditure of GDP, an index of labour market well-being, actual weekly hours worked, trade union density rates, the number of strikes and lockouts and occupational injuries.

of natural resources, and for promoting technological advancement and competitiveness (Mulder, 2007). The opening of an economy to new trading partners is seen to evoke joint productivity gains, in combination with the necessary production efficiency afforded by the increased environmental standards (Costantini and Mazzanti, 2012). It is herein presumed that environmental best practice is not necessarily cost bound in the sum of its application, but rather it induces domestic market competition to be more efficient, thus driving down production margins on average (Shrivistava, 1995). This intersection characterises a trade-off between environmental and economic targets and offers a diverse consideration as to the total trade effect of their inclusion (Mazzanti and Zoboli, 2009).

It is however well noted that the increasing decoupling of environmental performance with respect to growth is contingent upon features of market scale, composition, technological advancement, and trade effects (Levinson, 2010). It is additionally dependent on the inducement effect produced by the environmental policy mix on the innovation path (Hemmelskamp, 1997; Hemmelskamp and Leone, 1998; Requate, 2005; Requate and Unold, 2003; Roediger-Schluga, 2004). This inducement effect is also influenced by institutional, economic, trade, and policy frameworks which contribute to the creation and diffusion of leading innovations (Rennings and Smidt, 2008).

The capacity of environmental policies to reinforce international competitiveness and resource efficiency is particularly relevant when considering the trade-off between NTI mandates. The logic on how to move towards new growth scenarios assigns a key role to environmental sustainability (OECD, 2012). The ‘greening’ of economic performance and exports may lead to new and greener structural competitive advantages (Costantini and Mazzanti, 2012).

In particular, the EU has been one of the two key players in incorporation of NTIs within PTAs, the other being the United States. From the environmental literature, the EU has also historically been seen as a leader in the design and adoption of stringent environmental policies (Selin, 2015). Given the EU’s level of development, there have been accusations of ‘green protectionism’ (Berger et al., 2018), where it is considered that environmental protection (EP) inclusions are utilised for the purpose of inhibiting the competitiveness of middle-to-low-income nations.

However, Andersen and Ekins (2009) identified the ability for effectively adopted environmental policies to be a fruitful way to reconcile the environmental and economic performance of a nation. Additionally, Barker et al. (2007) and Pollitt and Junankar (2009) provide evidence discarding fears of potential negative effects associated with environmental tax reform and climate actions on employment, income distribution, economic growth and export performance.

The incorporation of properly designed environmental legislation policies included in PTAs has been theorised as leading to win-win effects which can improve both the efficiency and value of products (Porter, 1990; Porter and van der Linde, 1995; Wagner, 2006). As noted by Managi et al. (2009), these arguments are applicable to the relationships governed at the international trade and environmental protection level. When the focus is on specific effects generated by environmental regulation on comparative advantages, the two prevailing perspectives are the pollution haven hypothesis (PHH) and the aforementioned porter hypothesis (PH).

As far as the PHH is considered, environmental policy enters a Heckscher–Ohlin theoretical framework as a constraint to factor endowment. Thus, the introduction of more stringent environmental regulations is potentially harmful to international competitiveness of domestic firms facing higher productive costs, leading to delocalisation of dirty industries towards countries with a relatively lower burden of environmental regulation (Letchumanan and Kodama, 2000; Copeland and Taylor, 2004; Levinson, 2010).

On the contrary, the Porter hypothesis assumes a more comprehensive and dynamic point of view, as the combination of environmental policies with private and public innovation strategies may lead to increasing environmental efficiency combined with productivity gains, if public policies are well-designed in stimulating proper techno-organisational innovation patterns (Costantini and Mazzanti, 2012).

So far as the two theories dominate the empirical literature arena, findings are generally varied. Berger et al. (2018) find that the imposition of environmental norm inclusion across trade agreements has resulted in a loss of trade akin to the PHH. However, as noted in Costantini and Mazzanti (2012), their extensive review of the bound literature effects of environmental policy on economic circumstance tend to align more with the Porter Hypothesis. The exact nature of the relationship does however remain understudied.

Shared Vision and Ethics

Working along comparable lines to the standards logic, the third motivation for the inclusion of NTIs is the pursuit of a shared vision. Where there is a departure is in the motivation behind the inclusions. Instead of promoting standards that ensure quality product trade and security, a shared vision is underpinned by an ethical viewpoint that seeks to ensure fair treatment of people and places.

Rooted in theories of stakeholder composition in determining the NTI conditions of a given trade agreement, Bernauer and Nguyen (2015) investigate the environmental literature to promote the role of citizen motivation and the international response to domestic civil-society pressure. The theory promotes that vested civil-society interest groups may undertake extensive lobbying for NTI inclusions in agreements

with potential trade partners deemed to be acting against the *preferred norms*. This lobbying activity is typically associated with democratised, HI nations with the ability to ensure their inclusion. A nation subject to such domestic pressure from civil society may resultantly incorporate NTIs into their PTAs to maintain political viability. This argument may be extended to the theory of shared visions.

Drawing on shared-value theorem, a PTA can be used to formalise the desirable values of the majority trading group, such as environmental protection and labour standards (Milewicz et al., 2016). In this regard, a PTA provides the necessary institutional weight and resource pool to formalise the previously unlegislated shared values; an NTI in such a circumstances might promote greater standards and regulation objectives (Jinnah and Lindsay, 2016). Accordingly, the relationship between developed and developing nations is not so clearly defined when it comes to trade and the imposition of standards conditions (Milewicz et al., 2016). Whilst the imposition of greater regulatory standards incurs a greater domestic cost on middle-to-low-income nations (Copeland and Taylor, 2004), the overall trade impact is likely to depend on the level of development disparity between the trading partners, and the market access potential following the adoption of the agreement.

Perhaps unsurprisingly, the EU is seen as one of the key promoters of ethical conditions within global trade deals (Zamfir, 2018). The EU sees that protection of human rights is one of their overarching objectives in its external action, in line with the Treaty of the European Union' (Ionel, 2019). Utilising the power leverage and market access arguments discussed earlier, the EU is able to entice developing countries to sign up to agreements that incorporate explicit human rights conditionalities in return for preferential market access. This access can be withdrawn in any case of systematic violations, hereby creating a 'carrot and stick' incentive mechanism for the economic trajectory of a given developing nation. Specific inclusions could be extended to the promotion of nations incorporating of the eight international conventions of the ILO (Velluti, 2016).

The European utilisation of civil and political right conditionalities extends back to the establishment of the General System of Preference (GSP)[52]. The GSP was established as a mechanism that could provide preferential market access to developing countries in exchange for their address of various non-trade and human rights areas, including forced labour, drug and human trafficking, and fair wage. In 2005 the GSP

[52] An EU trade regime established in line with the World Trade Organization (WTO) Enabling Clause and granting unilateral trade preferences to developing countries classified as low-income or lower middle-income economies or as least developed countries (LDCs). Countries party to a preferential trade agreement with the EU, providing at least the same level of tariff preferences, are excluded after a transitional period (Zamfir, 2018).

structure was adapted to a three-layered structure comprising: Everything but Arms (EBA)[53]; Standard GSP[54]; and GSP+[55]. The new structure provides a systematic mechanism to address specific human rights concerns that are associated with particular levels of development (European Commission, 2013).

As noted by Hafner-Burton (2005), a growing number of PTAs have begun to play a significant role in governing state compliance with human rights. In their traditional role of liberalising trade relationships for the purpose of increasing trade flows between signatories, they have also become a tool to supply hard standards that tie material benefits of integration to compliance with human rights principles. It has been found that PTAs form a stronger and more effective tool for influencing human rights behaviours and changing repressive practice than alternative mechanisms (Hafner-Burton, 2005). Theoretically, PTAs improve members' human rights through coercion, by supplying the instruments and resources to change actors' incentives to promote reforms that would not otherwise be implemented (Hafner-Burton, 2005).

The motivation for the incorporation of these NTIs was born out of the ambition of human rights agreements (HRAs). HRAs are substantial formal treaties, conventions, and protocols intended to protect the inalienable rights of human beings (OCHR, 2019). They were designed to regulate sovereign governments behaviours towards individuals, encouraging repressors to change their practice (Rosati, 2001; Lutz and Sokkink, 2000; and Hathaway, 2002). Whilst there is some proof that HRAs were able to deliver some of the desired changes they promoted, many scholars remained unconvinced, and the assumption of effectiveness has been seldom tested. The opposite sees that HRAs lack the engine of compliance necessary to make the desired changes such that there is no apparent material incentive to conform, and no superior power authorised to compel observance (Hafner-Burton and Tsutsui, 2005).

Accordingly, alternative mechanisms were explored to deliver the desired changes. In particular, the PTA emerged as a tool that allowed for a formal institution to embed human rights protection mechanisms into rules governing market access (Lechner, 2016). PTAs provide a mechanism whereby the economic

[53] A special GSP arrangement granting full duty-free, quota-free access for all products except arms and ammunition to countries classified by the United Nations (UN) as LDCs (Zamfir, 2018).

[54] Grants customs duty reductions for around 66 % of all EU tariff lines to developing countries classified by the World Bank (WB) as low income or lower-middle income economies and which are not among the LDCs (Zamfir, 2018).

[55] A special incentive arrangement granting duty-free access for essentially the same 66 % of tariff lines as standard GSP, to countries which are considered especially vulnerable because of a lack of economic diversification and insufficient integration within the international trading system. In order to be granted the GSP+ status, countries have to ratify 27 international human rights, labour rights, sustainable development and good governance conventions, and comply with them, including with their monitoring requirements (Zamfir, 2018).

circumstance of a country's trading relationship can be contingent upon the manner in which it treats its people.

In terms of the level of enforcement and engagement, some agreements, such as the Euro-Mediterranean Association Agreements, supply 'hard' conditions that tie agreement benefits to member compliance with specific human rights principles. Others, such as the West African Economic and Monetary Union, supply 'soft' conditions that are only vaguely tied to market access and unconditional on member states' actions. Hard versus soft definitions are proposed by Abbott and Snidal (2000) and described in greater deal in the methodological section of the chapter (section 2.3). PTAs are therefore a suitably designed tool for the incentivised adoption of voluntary commitments to coordinate market policies at a transnational level.

When PTAs supply soft human rights conditions, they offer no capacity for coercive influence (Hafner-Burton, 2005). Like HRAs, these agreements are at best designed to supply weak tools of persuasion and are unlikely to have any strong influence on government repression. However, when they implement hard conditions; PTAs influence through coercion. They provide member governments with a mandate to protect certain human rights, while they supply the material benefits and institutional structures to reward and punish members' behaviour. Coercing repressive actors to change their behaviours requires a conditional supply of valuable goods wanted by target repressors. These agreements accordingly improve members' human rights by supplying the instruments and resources to change repressive actors' incentives to promote policy reforms that would not otherwise be implemented (Hafner-Burton, 2005).

In this respect, its expected that CSR inclusions in fact result in positive trade gains between nations at all development levels. From a trade perspective, the commitment to these measures at a meaningful level would be associated with a trade boost as developing nations receive preferential market access at greater levels for their commitment to human rights. This is magnified by the stability that commitment to human rights promotes. It additionally is theorised that, by creating a more equitable and fair nation, as regards the treatment of its people, that the economy will receive a subsequent boost as more entrepreneurial behaviour can take place in the private sphere.

2.2.3. Trade Impact Theory

The motivation of this chapter is to identify the average treatment effect of NTI conditionality upon bilateral trade flows. So far the literature has provided an excellent source of uptake motivation, as well as subsequent impact theories and outcomes across the relevant governance areas. Table 2.1 contains a summary of the three key motivations: protectionism, standards, and shared values. Each motivation

outlines a similar narrative for trade implication. NTIs may erode market competitiveness through the cost of adherence, hereby dampening bilateral trade, or they may in fact bring about enhanced competitiveness through the removal of constraints on productive efficiency and bring about an increase in bilateral trade. In light of this, the implication resides in the cost-of-compliance burden and its interplay with market forces.

Table 2.1: NTI Inclusion Motivations (Summary)

Motivation	**Overview**	**Implication**
Protectionism	NTIs are incorporated to mitigate the adverse effects of uncompetitive practice.	Protectionism reduces market competitiveness by addressing cost and scale advantages of underregulated developing markets.
Standards	NTIs are incorporated to uphold regulatory standards between all trading partners.	The imposition of standards dampens competitiveness through the cost of compliance to regulatory standards. Promoting the adoption of standards for the benefit of people, environment, and process, for the purpose of ensuring that goods traded meet the requisite standards within the production chain. The adoption of regulatory standards brings about the removal of market distortions resulting in enhanced productivity and market competitiveness.
Shared Values	NTIs are incorporated to align trading partners in working towards a common ethical goal.	The pursuit of shared values imposes costs on yet-to-be compliant trading partners, hereby reducing competitiveness. Adherence to shared values may improve members' human rights and environmental conditions by supplying the instruments and resources to change repressive actors' incentives to promote policy reforms. These policy reforms, in themselves, act to enhance market competitiveness.

Undoubtedly, the imposition of NTI conditions in a PTA incurs costs. As outlined by Milewicz et al. (2018), the institutional cost of adhering to an agreement's NTI stipulations are unavoidable where a previous nations approach was either absent or below the requisite threshold. For example, the adoption of environmental legislation can be expected to incur costs of education, enforcement, and adaptation for a

nation that previously had none. However, despite these initial costs, the aggregate level adjustment should be expected to incur a bilateral trade increase between signatories.

The primary justification for this can be derived from the increased market access that is granted upon the agreement coming into play. The NTIs broadly represent a bracket of necessary conditions required to gain that market access. In absence of these conditions there will be limited-to-no market access granted. Increasingly, and as noted by Milewicz et al. (2018), PTAs are utilised to dictate the rules of international trade and NTIs form a core contingent of the contemporary design. This is enhanced by the public interest around issues surrounding social, ecological, and political circumstance (Lechner, 2019). As alluded to in the discussion, on a deconstructed level, different NTI classifications will provision for different outcomes as regard their impact on different economic agents. In this respect there are three distinct classifications of NTI that have been discussed throughout the motivation section of the chapter and are contained in table 2.2[56].

Table 2.2: NTI Classifications

NTI	**Description**
Economic and Social Rights[57] (ESR)	The provisions that relate to the labour law space. They describe, among other things, the rights of workers to receive appropriate pay, fair working conditions, and non-discriminatory workplace cultures. In the absence of ESR measures in a nation, typical features of low wage and poor working conditions constitute a humanitarian concern (Lechner, 2016).
Environmental protection[58] (EP)	PTAs increasingly incorporate environmental standards. The precise history of the environmental-trade relationship was triggered in the 1970s by the oil crisis and re-emerged during the 1990s where environmental standards (and indeed all NTI standards) become a refocused discussion in international trade (Chichilnisky, 1994; Rauscher, 1997)

[56] The NTI classifications discussed in this section are categorised by Lechner (2016) and are the classifications for which indexes have been coded and will be utilised in this chapter.

[57] In the measurement of this chapter, ESRs cover the right to work, rights at work ((right to collective bargaining, the elimination of all forms of forced and compulsory labour, the effective abolition of child labour, the elimination of discrimination in respect of employment and occupation, minimum wage, and the right for leisure), right to education, the right to development, and the right to health (Lechner, 2016).

[58] In the measurement used in this chapter, EP conditions regard taking care of natural resources (water, soil, forest), the reduction of waste and air pollution, and the protection of wildlife and game.

Civil and Political Rights[59](CPR)	Traditionally governed in the NGO space and focus on governing areas of human rights, and the reduction of exploitative practice and political representation (Hafner-Burton, 2005).

Each classification can be expected to change the domestic productive mix for those in adherence. For example, environmental standards can be expected to encourage technological progress and greater efficiency following the Porter Hypothesis; whilst upholding labour and freedom standards can be expected to remove artificial repressive barriers and encourage a more productive economy (Maskus, 1997). However, as has been a recurring theme throughout the discussion thus far, the exact impact is itself contingent upon the level of development and power of the signatory in question.

The primary focus of the discussion revolves around the interplay between HI and MTLI nations. MTLI nations are willing to accept the conditions outlined in a trade agreement if the level of market access is suitably compensatory for any theorised domestic disruption. These conditions, despite their short run cost imposition, are then expected to engender productivity boosts across time. Primarily, this is expected to follow from the development of stability around production, as trading partners commit to a baseline of standards and protocols.

The picture is less clear for pairs of MTLI nations. South-south trade agreements are considered as an alternative opportunity for developing nations to diversify their trade partners and boost economic growth (Amsden, 1989; Lall and Teubal, 1998). However, the resultant composition-of-contents in south-south PTAs tends to be shallower and focused on at-the-border trade-barrier liberalisation (Dür et al., 2014). As such, MTLI trade relationships under a trade agreement with a high burden of NTI adoption will be unable to compensate cost of regulatory compliance with the greater trade flows available from HI trade partners.

The same drivers are not expected to engender market access restrictions or uncertainties between developed nations in the same way. This is due to their greater level of alignment across domestic regulation. Accordingly, the associated competitive advantage of a given developed country will not be significantly affected by greater extensive or intensive NTI margins in the governing PTA framework (Berger et al., 2018). The legitimacy of the power supremacy assertion derives from the historical basis for the move beyond direct-trade conditions.

[59] In the measurement used in this chapter, CPRs relate to human dignity, the right to political participation, the right to free movement, women's and children's rights, minority protection, and the rule of law (Lechner, 2016).

Accordingly, at the aggregate level of NTI inclusion in PTAs, the expected net trade effect could be either positive or negative. In the case of a developing (MTLI) nation signing a PTA with a greater degree of NTI conditionality, one can expect higher costs of compliance. This could theoretically dampen trade competitiveness. However, this may be balanced out by a larger trading network that can compensate for the cost of compliance with greater trade opportunities.

2.3. Methodology. The Gravity Model

The primary interest of this chapter is in identifying the average treatment effect of NTI provisions on bilateral trade flows. In addition, I will also measure the comparative impact of the national development level of trade partners upon the treatment effect between NTIs and trade.

As it was the methodological approach for chapter one, this chapter utilises the Gravity Model for trade to measure the treatment effect of NTI conditions on bilateral trade flows. Accordingly, this section will summarise only the necessary developments and practices of the model of relevance to this chapter, and the reader is invited to revisit section 1.4 for a more thorough review.

At its core, the gravity model is an initiative modelling of bilateral trade relationships, principled upon Newton's Law of Universal Gravity (Shepherd, 2016). Considered to deliver one of the most robust empirical findings in economics (Chaney, 2013), bilateral trade between two countries is proportional to size, measured by GDP, and inversely prerational to the distance between them (Chaney, 2008). In addition to the standard model, Tinbergen (1962) also provided estimates for the implication of a number of additional trade costs that exist beyond trade: such as, the presence of a common border, the adoption of a trade agreement, or the use of a common currency (Ekanayake et al., 2010). Throughout the subsequent 50 years, several steps have been taken to both popularise and theoretically strengthen the gravity model (Piermartini and Yotov, 2016). Of particular note are the advances associated with: Anderson (1979), and the introduction of Armington preferences to derive a role for transport costs; Bergstrand (1985), and the increasing returns framework; Helpman and Krugman (1987), and the integration of monopolistic competition into a Heckscher-Ohlin framework; and, in particular, Anderson and van Wincoop (2003) for the development of the gravity with gravitas model.

The primary challenge presented by the gravity model is that of multilateral resistance. Prior to Anderson and van Wincoop's (2003) promotion of multilateral resistance terms, the inclusion of country fixed effects was proposed (Hummels, 1999; Feenstra, 2002). The difficulty, however, is that multilateral resistance terms are theoretical constructs and as such not directly observable by the researcher (Shepherd, 2016). Olivero and Yotov (2012) have subsequently extended the cross-section recommendation to demonstrate that the multilateral resistance terms should be accounted for by exporter-year and importer-year fixed effects in a dynamic gravity equation framework with panel data[60].

[60] It should be noted that these fixed effects will also absorb the size variables, alongside characteristics such as national policies, institutions and exchange rates.

In addition to the multilateral resistance issue, a common challenge is rooted in the presence of zero-trade flows (Shepherd, 2016). As promoted by Santos Silva and Tenreyro (2006), a convenient solution is to estimate the gravity model in its multiplicative form and employing the PPML estimator. Beyond its ability to deal with zero-trade flow observations, the use of PPML also effectively addresses the issue of heteroskedasticity, which would otherwise render gravity estimates biased and inconsistent (Anderson and van Wincoop, 2003; Santos Silva and Tenreyro, 2006).

Of particular importance to this chapter's estimations is the issue of endogeneity, where it is possible that the trade policy is correlated with unobservable cross-section trade costs (Trefler, 1993; Baier and Bergstrand, 2007). This can occur where there is an omitted variable bias, a measurement era, or there is reverse causality present. The solution advocated by Yotov et al. (2016) is to incorporate bilateral country-pair fixed effects that will account for the unobservable linkages between the endogenous trade policy variables and the gravity model error term. An additional benefit of including country-pair fixed effects is its ability to address multilateral resistance in a dynamic panel data (Piermartini and Yotov, 2016). Thus, the methodological adoption of a full set of fixed effects ensures that the issue of endogeneity is accounted for, addressing the omitted variable bias issue.

An additional challenge to the reliability of the estimations concerns the fact that trade policy changes are unlikely to be instantaneous (Trefler, 2004). In order to account for the adjustment issue, regressions will be undertaken utilising lagged independent policy variables. The lag will be three years following the literature standard (Olivero and Yotov, 2012).

Reverse causality is an additional ever-present in the trade literature that must addressed in the empirical specification (Shepherd, 2016). The question arises as to whether trade agreements engender trade, or whether established trading partners opt to formally ratify their already thriving trade relationship. In order to address this, a regression will be tun utilising a time-lead form of the independent policy variable. Specifically, a three-year lead will be used in order to identify whether or not there is a statistical correlation where there should not be one; the bilateral trade flow between country *x* and country *y* in 1997 should not influenced by the ratification of a PTA between the two nations that came into effect in 2000.

2.4. Data, Testing, and Results.

This section contains the results and discussion of the empirical testing. It begins by providing an overview of the dataset contents before moving on to discuss testing and results.

2.4.1. Dataset Description

The dataset utilised in this chapter has been designed to capture the treatment effect of the NTI conditions contained in PTAs on global bilateral trade flows. It contains all bilateral partnerships across 160 nations for a 46-year period (1970-2015). Bilateral trade data was sourced from the IMF's DOTS and covers the period 1984-2015. Trade flow figures will be given in standard volume as the Poisson Pseudo-Maximum Likelihood (PPML) estimator does not require the logged version. The resulting panel is unbalanced, with a total of 1,170,240 trade flow observations. These come from 25,440 exporter-importer pairs. The standard bilateral trade cost variables identified in the literature covering contiguity, common language, common currency, and distance are all sourced from the CEPII Gravity Model dataset.

In order to classify exporters and importers as either high-income or middle-to-low income (MTLI) countries, I use the respective World Bank classifications for development. The MTLI classification incorporates nations identified as low income, lower-middle income, and upper-middle income. The thresholds to distinguish between the income groups have been adjusted for prices over time. As of 1 July 2019, low-income economies are defined as those with a GNI per capita of $1,025 or less in 2018; lower middle-income economies are those with a GNI per capita between $1,026 and $3,995; upper middle-income economies are those between $3,996 and $12,375; HI economies are those with a GNI per capita of $12,375 or more. The classifications have been developed dualistically according to the logic of power leverage. The ability to lobby for an NTI inclusion within a PTA is predicated on the size and power of the negotiating parties involved. HI (developed) nations are identified to be the primary drivers of these inclusions (Vogel, 2013; Postnikov, 2014; Lechner, 2016). Accordingly, all other income levels are considered to face the same primary motivation for market access and can accordingly be suitably classified together.All PTAs have been introduced from the Design of Trade Agreements (DESTA) dataset, which is by far the most comprehensive collection of PTAs available (Dür et al, 2014; Berger et al, 2018). Resultantly, this chapter's dataset has coded for 475 trade agreements. All dyadic partnerships in the dataset have been coded with the relevant NTI classification where there is a PTA between the nations. In bilateral trade relationships between HI and middle-to-low-income nations, the associated cost for the MTLI nation to adhere to NTI conditions is accounted for through the trade relationship (Fugazza and Nicita, 2010). The compliance with PTA conditions provides preferential market access to a developed market and is

resultantly theorised to boost exports. As such, the trade impact of NTI conditions is made at the cross-section between market liberalisation and regulatory compliance. Accordingly, the remaining income classifications for nations are subsumed under the MTLI bracket as they are considered to face the same primary motivation for market access.

NTI Data

The feature independent variables are the codified classifications of non-trade inclusions covering environment, labour, and civil society, as developed by Lechner (2016). Whilst the frequent inclusion of NTIs has characterised PTAs for over 25 years, their terms of precision, obligation and delegation have varied considerably, leading to an underspecified classification (Abbott et al., 2000). Typically, an NTI condition is framed as a trichotomy of law implementation: non-existence, soft-law or hard-law. There is of course far more nuance in the reality of inclusion, implementation and outcome. To address the issue of under-specification, Lechner (2016) compiled a dataset coding the data on NTIs for 475 PTAs. The coding scheme is designed to capture the legalisation of conditionality (as informed by Abbott et al., 2000).

Based on the work of Abbott et al. (2000), legalisation is an empirically based conception of international legalisation to show how law and politics are intertwined across a wide range of institutional forms. Trade agreements represent a comparable tool as regards the intersection between international law and politics such that it can suitably capture the relative weight of a given NTI inclusion. In addition, the increasing focus of depth in the literature, is particularly of interest for the discussion on NTIs. As NTIs legislate for contractual agreement areas that go beyond the traditional market focus agenda, the level of legal enforceability is very important to capture. The concept of legalisation is defined along three dimensions: obligation, precision, and delegation. A trade agreement that incorporates a greater degree of commitment across the three measurement features has imposed a greater commitment towards NTIs for the signatory parties than an agreement with a lower level of legalisation (Lechner, 2016).

Obligation means that signatory parties make legal commitments that indicate the ‘intent to be legally bound’ (Abbott et al., 2000). Extensive obligation involves commitments to clauses obliging members to comply with NTIs as a condition of receiving economic benefits. Low obligation runs in contrast and is representative of a circumstance where provisions that call for the promotion of a given NTI, as opposed to the legally binding commitment to institutionalise it (statement over and above action). In the middle of these two extremities, countries might opt for general obligations that compel members to respect non-trade issues or to embrace NTIs as their principle, specific obligations that pledge members to not conduct economic actions that imply a shortening of NTIs measures, and hortatory obligations with recommendations that suggest concrete measures for NTI compliance improvement. Precision regard’s the

degree to which rules 'unambiguously define the conduct they require, authorise or proscribe' (Abbott et al., 2000). A set of very precise rules will clearly stipulate a certain behaviour, whereas general wordings leave the contracting parties with their own interpretations that might conflict with the spirit of the commitment. For example, whereas 'environmental protection' counts as a general reference, specific inclusion of actions such as 'reducing CO2 emissions' or 'reducing waste' are specific NTI conditions.

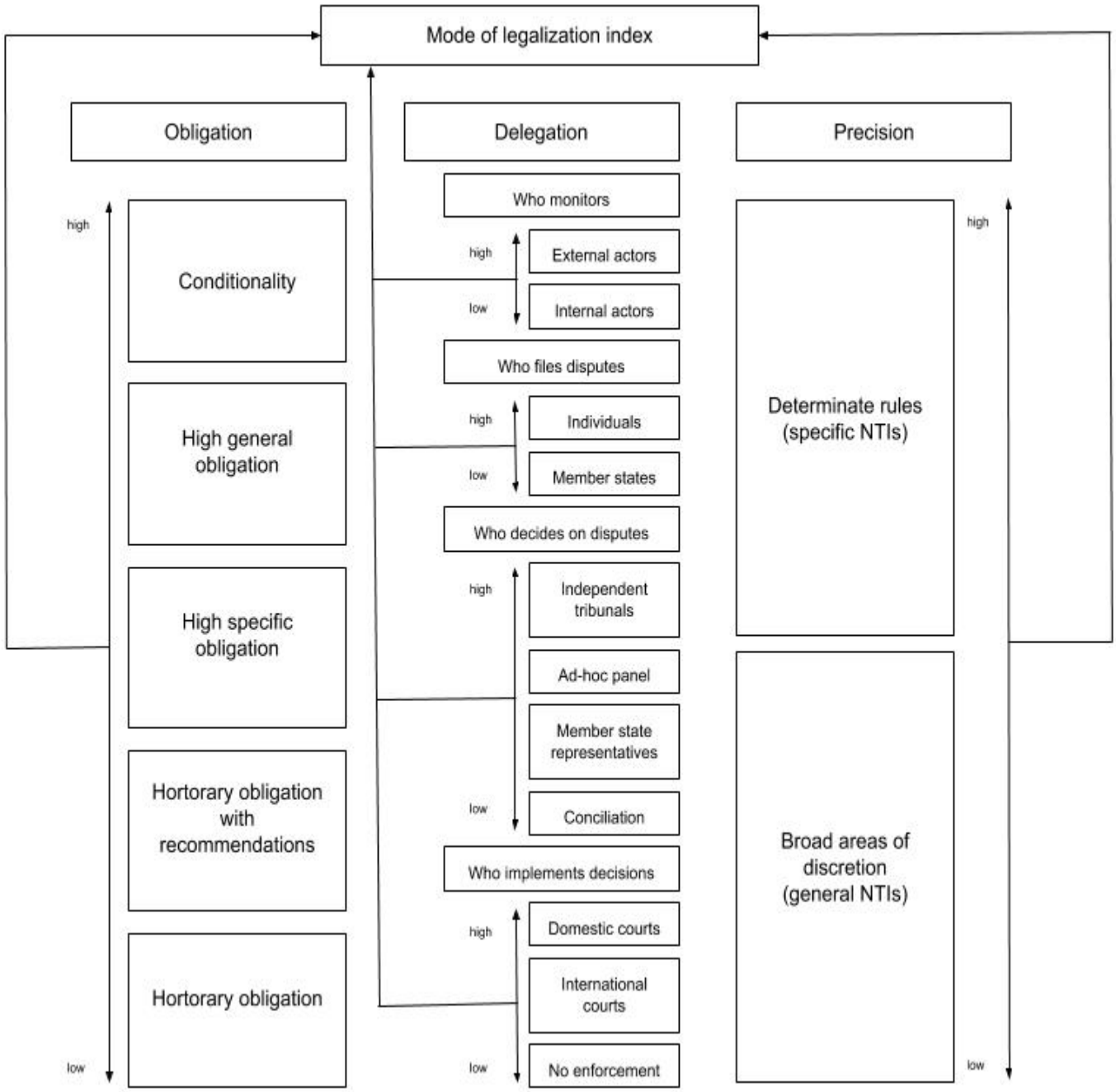
Going beyond the differentiation between general reference and specific non-trade issues, Lechner (2016) discriminates between agreements by counting with how many NTIs a general NTI is defined. Delegation captures the feature of responsibility as regards agency: 'third parties have been granted authority to implement, interpret, and apply the rules; to resolve disputes; and potentially make further rules' (Abbott et al., 2000). In the light of non-trade issues in trade agreements, four tasks might be delegated: the monitoring process; the filing of disputes; the decision-making of disputes; and the implementation of disputes. Each task can be highly delegated, where third parties decide on the basis of clear and generally acceptable rules, or carried our via political bargaining between parties 'who can accept or reject proposals without legal justification'. Treaties might delegate all or none of the tasks (or indeed any number in between). Each combination is possible in both theory and practice. Figure 2.3 provides a summary of the Abbott et al. (2000) legalisation framework utilised by Lechner (2016; 2019) to code NTIs.

The advantage of the legalisation approach to codification is that ability to capture variance more appropriately. This is important because it speaks to the specific infringement imposed by the agreement on all signatories. One would expect that where the degree of legalisation is greater for an NTI, there will be a greater imposition (or need) to take up the agreement. For developing nations, this is going to entail a greater cost in theory as they adapt the domestic situation to respond to international standards impositions from more developed nations.

The coding schematic was applied across the three core non-trade issues:

1. **Environmental Protection (EP)**: the care for natural resources, reduction in waste and air pollution, and protection for wildlife and game.
2. **Economic and Social Rights [ESR]**: including the right to work, rights at work, right to education, the right to development, and the right to help.
3. **Civil and Political Rights [CPR]**: conditions that capture human dignity, the right to political participation, the right to free movement, women's and children's rights, minority protection, and the rule of law.

Figure 2.3: Mode of Legalisation for NTIs in PTAs



Source: Lechner (2018)

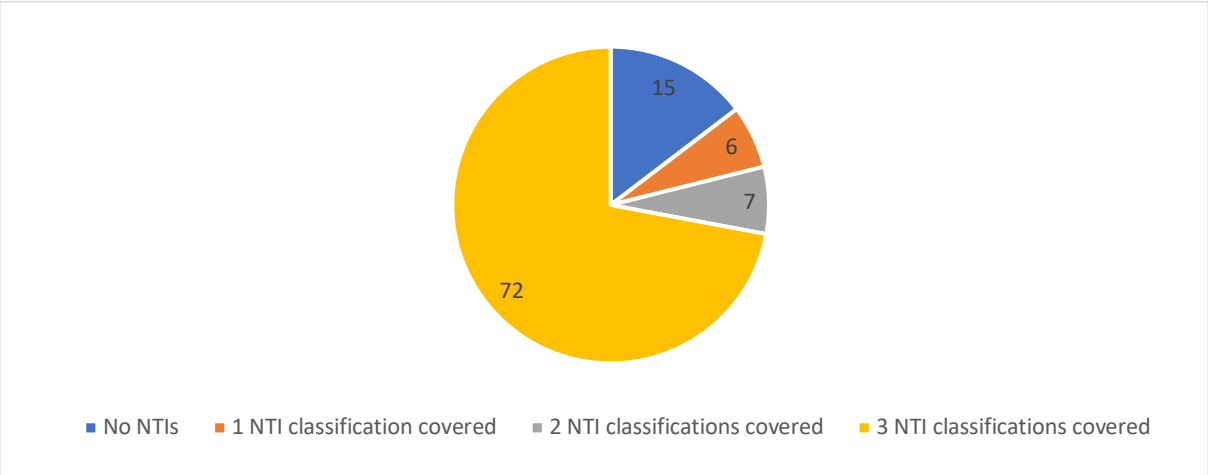
For each of these non-trade issues, Lechner (2016) has coded over 50 data points per agreement. In total, 262 data points serve as a basis for the indices[61]. An issue was coded zero if the members do not mention the aspect in the agreement or the members are explicitly against the respective issues; and coded it one if the members committed to an aspect. Several reliability checks were utilised to check for random coding errors, with the average Cohen-Kappa score across all five reliability checks being 0.60[62]. Figure 2.4

[61] The full list of data points can be found in table A-3 of Lechner's (2016) online appendix.

[62] This is recognised as a substantive agreement.

highlights the breakdown of NTI classification by the percentage of trade agreements they appear in. The majority of PTAs contain at least one NTI reference for all three classifications, with 15 percent of all PTAs containing no NTIs at all; of which the majority are south-south agreements including Chile-Venezuela (1993), Argentina-Cuba (1999), and Peru-Thailand (2005).

Figure 2.4: NTI Coverage of PTAs, % (1970-2016)



The 262 data points were then aggregated to 126 variables[63] in order to conduct a latent trait analysis (LTA). LTA is a method developed specifically for binary data (Rasch, 1980). Compared to other scaling methods, the advantage of LTA is that it omits the assumption of equal difficulty among items. LTAs core purpose is to measure the difficulty of each item getting selected (Heinen et al., 1996). The application of the Rasch model across all variables therefore derives a weighted 'difficulty score' that is utilised under a weighted likelihood estimation (Warm, 1989) to deliver an additive score. The use of LTA provides a robust measurement for NTI conditions in PTAs. The measurement represents the mapping of a group of predefined characteristics and their empirically observable relationship with a set of numbers; the Rasch score (Bartholomew et al., 2011). Rasch analysis permits the rating of a limited set of attributes that are representative of the underlying trait.

The summed rating of the attributes represents how much of the trait has been mastered, since the raw score is the 'sufficient statistic' for the Rasch measure. Accordingly, an index constructed utilising this method provides a suitable metric to capture the observed variance across PTA design. A greater index score represents either a greater number of conditions relative to the category, or a greater level of conditional compliance over deterministic conditions. It hereby recognises that the architecture of conditionality varies

[63] See table A2 in the Lechner (2016) appendix.

across agreements, and that this can lead to different outcomes. Additional discussion on Rasch analysis can be found in Appendix A2.

Following the recommendations of Olivero and Yotov (2012), the regression has additionally been run at time utilising independent variables at time t, and with three-year and five-year lagged forms to account for market adjustments to policy changes across the trade landscape. A three-year time lead form of the independent variables has been employed to methodologically address the issue of reverse causality. Alongside the NTI variables, regressions have been run with the level of depth[64], and the presence of a PTA as control variables.

2.4.2. Model Testing

Rooted in the methodological discussion of the previous section, this chapter employs the following gravity model specification in order to ensure a robust, theoretically grounded, and econometrically consistent model.

$$(2a)\ \mathrm{X}_{ij,t} = c + \beta_1 \ln GDP_{i,t} + \beta_2 \ln GDP_{j,t} + \beta_3 \tau_{ij,t} + \beta_5 \mathrm{NTI\_Index}_{ij,t} + \beta_6 \mathrm{PTA}_{ij,t} + \beta_7 \mathrm{Depth}_{ij,t} + \left[FE_{ij,t}\right] + e_{ij,t}$$

$$(2b)\ \tau_{ij,t} = \ln\left(DIST_{ij}\right) + CONT_{ij} + COMLANG_{ij,t} + COLONY_{ij}$$

$$(2c)\ \mathrm{FE}_{ij,t} = \Pi_{i,t} + \mathrm{P}_{j,t} + \lambda_{ij}$$

Where, $\mathrm{X}_{ij,t}$ represents the bilateral trade between exporter *i* and importer *j* at time *t;* GDP is the proxy for national size; and $\tau_{ij,t}$ represents the standard proxies for trade cost determined in the literature: Distance (DIST) in km between bilateral nation pairs; contiguity (CONT) as a binary variable equal to one where countries *i* and *j* share a border; presence of a common language (COMLANG) as a binary dummy equal to one where both countries predominantly speak the same native language; and colonial ties (COLONY) as a binary variable equal to one where both nations have a shared colonial history.

As this chapter is concerned with the estimation of the treatment effect between non-trade issue conditions and bilateral trade flows, NTI_Index represents the inclusion of one of the three NTI indexes developed by

[64] Depth is increasingly acknowledged to be a suitable control variable for inclusion in gravity model analysis (Fontagné et al., 2021). In the previous chapter, flexibility and constraints in flexibility where also incorporated in order to identify the average effects of PTA conditionality design. These are dropped for chapter 2 as the conditionality design features of interest are NTIs.

Lechner (2016)[65]. Fixed effects are represented by FE_{ij}, and are such that: $\Pi_{i,t}$ represents country fixed effects for importer at time *t*; $P_{j,t}$ is country fixed effects for exporter at time *t*[66]; and λ_{ij} is a dyad fixed effect between importer and exporter[67].

In addition, I control for the presence of a PTA utilising both a binary index to represent the presence of a PTA between trade partners, $PTA_{ij,t}$, and the depth score utilised in chapter one developed by Dür et al. (2014), $Depth_{ij,t}$. The methodological advantage of employing the depth variable is that depth captures the necessary variance in level (number of conditions) and legal enforceability (of the conditions) that form the trade relationship between the signatories. This relationship would necessarily influence the impact of the given NTI conditions in the trade agreement.

In order to account for the time-adjustment identification of Trefler (2004), subsequent estimation will also utilise a lagged independent variable form of NTI_Index. The time lags will be three and five years as a result of their empirical significance and suitability (Cheng and Wall, 2005; Olivero and Yotov, 2012). This will account for the reality that policy changes are rarely instantaneous and need time to imbed within an economy. In addition, and in order to address the issue of reverse causality, each index will be tested with a three-year time lead.

2.4.3. Testing and Results

Where trade agreements and bilateral trade are concerned, it is commonly accepted that PTAs are associated with a positive increase in trade between nations (Cipollina and Salvatici, 2010; Dür et al., 2014). According to Head and Mayer's (2014) meta-analysis of policy dummies[68], the adoption of a trade agreement is associated with a boost to bilateral trade of 43 percent. As identified by Dür et al (2014), this effect is

[65] Economic and social rights [ESRs], environmental protection [EP], and civil and political rights [CPRs].

[66] When scaled to country-time fixed effects, a dummy is, for example, assigned to Brazil as an exporter in 1970 across all importers, and another for Brail in 1971 across all importers. Accordingly, GDP is omitted due to collinearity.

[67] Following the recommendation of Baier and Bergstrand (2007), it has been found that utilising a full set of fixed effects deliver an empirically, and theoretically, suitable address to the issues of endogeneity and collinearity; providing consistent estimations of trade policy variables as they are, by proxy, varying across time and by partner. Resultantly, covariates that remain constant between trade partners are subsumed into the fixed effects estimation: such as contiguity, common language, distance, and a colonial link.

[68] Head and Mayer (2014) provide a meta-analysis of the most frequently used variables in gravity estimations. The variables were sourced from all papers published in the top-5 journals, the Journal of International Economics, and the Review of Economics and Statistics.

largely driven by deeper agreements that commit signatories to greater trade liberalisation. However, this clarity as to PTA impact is considerably less clear when it comes to the impact of non-trade issue conditions. As discussed, the prevailing aggregate proposition is that NTIs are motivated by the protectionist concerns of HI nations in response to competition from underregulated markets in middle-to-low income nations (Bhagwati and Hudec, 1996). In line with this logic, the trade effect is presumed to be negative in association with the cost of compliance (Bhagwati, 1994; Jinnah and Lindsay, 2016).

When broken down to the individual characteristic theories, the outcome is perhaps less clear. In the environmental protection literature, the debate rests on whether environmental standards are a constraint on international competitiveness, as in the pollution haven hypothesis, or an innovation inducing productivity boost as considered by the Porter hypothesis (Costantini and Mazzanti, 2012). Regarding labour standards, the prevailing view is that developing economies lack the sufficient technical capacity and resources to implement enhanced standards and therefore lose their source of economic competitiveness (Martin and Maskus, 2001), hereby dampening trade. However, as noted in the work of Häberli et al. (2012), higher labour standards are associated with a boost to economic output performance as a result of the removal of labour-market distortions. Along a similar vein, the conditional imposition of human rights measures is expected to engender a more stable and predictable trading environment (Hafner-Burton, 2015), but may also generate a loss of international competitiveness.

What further intrigues this study is the insight that middle-to-low-income nations will experience a greater magnitude of impact than HI nations as a result of the motivational structure of NTI inclusion (Berger et al., 2018). HI nations are motivated to introduce protectionist measures in order to maintain their home-market competitiveness from foreign competition (Sykes, 1999). As HI nations are likely to have comparably developed NTI regulatory environments, the inclusion of specific measures in a PTA is unlikely to incur much cost. By comparison, middle-to-low-income nations will incur a cost of compliance that dampens trade competitiveness (Berger et al., 2018). Accordingly, this chapter utilises the NTI index classifications of Lechner (2016) and measures the treatment effect of their inclusion upon bilateral trade flows using a robust form of the gravity model of trade (2a). The motivation of testing is twofold: firstly, to identify the effect of NTIs on trade; and secondly (and perhaps more importantly) to identify whether the impact of their inclusion is greater for middle-to-low-income nations than HI partners.

Empirical Testing 1: NTIs and Trade

Before running the regressions on individual NTIs it is important to identify the average impact they have on bilateral trade. Accordingly, a regression incorporating a full set of fixed effects is run to estimate the

impact of three PTA classifications: (1) average PTA; (2) PTAs with NTIs; and (3) PTAs with no NTI inclusion. As can be seen from the results in Table 2.3, PTAs are associated with a statistically significant return to bilateral trade (0.3281). This increases for agreements that contain NTIs. This can be explained through the lens of greater regulatory alignment under such agreements, and the larger extent to which a PTA with NTIs removes market frictions. By comparison, PTAs with no NTIs have a smaller trade effect. This reflects the comparatively lesser extent to which signatories will align their regulatory standards, focusing instead on trade measures surrounding at-the-border issues.

Table 2.3: Regression Results. PTAs with and without NTIs

Variables	$Trade_t$	$Trade_t$	$Trade_t$
PTA	0.3281***		
	(0.000)		
PTA_NTI		0.3782***	
		(0.004)	
PTA_NO_NTI			0.2730***
			(0.000)
Pair FE	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes
Observations	891,894	216,403	663,891
R_Squared	0.9944	0.9983	0.9942

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at the 5% level; (***) significant at 1% level.

In line with the above results, one would expect the individual NTI classifications to equally incur a boost to trade. Tables 2.4 to 2.6 contain the estimations for the regressions conducted between the NTI condition indexes and bilateral trade flows. Immediately apparent, and of great significance, across the three tables is the positive coefficient associated with each NTI index. On average, each NTI condition set is associated with a positive return to bilateral trade, all else held equal.

There are two lines of logic that are important to understanding these results at the collective level. Firstly, there is the aforementioned impact of market access. Whilst there is little doubt within the literature that power-supremacy plays a significant role in the determination of NTI inclusions across PTAs (Vogel, 2013; Postnikov, 2014), and that these inclusions incur a cost, this cost is the price of market access. They represent a scale whereby the more legalised, and therefore actionable and binding, a PTAs NTI conditions are, the greater the market access opportunity given in response. Theoretically, this outcome aligns with

theories on market harmonisation, shared values, and market access, whereby NTIs are theorised to enhance the cooperation mechanisms that support bilateral trade, such as the removal of barriers and regulatory standards alignment. Secondly, the promotion of greater standards and regulations through NTIs is set to ensure a more stable production and trading environment. Previous market inefficiencies that accrued under a weaker human rights or labour protection system resulted in a suboptimal productive capacity that weakens long term trading prospects. Utilising Porter's Hypothesis as an illustration; the requirement to incorporate, perhaps costly, standards around environment invites competition for better productive techniques to bring the marginal cost back down. It is in the second line of logic that explanations for the variation in effect between NTI classifications will emerge. Beginning with ESRs in Table 2.4.

Table 2.4: NTI Regression Results. Economic and Social-Rights[69]

Variables	$Trade_t$	$Trade_t$	$Trade_t$	$Trade_t$
ESR_t	0.0160**			
	(0.025)			
ESR_{t-3}		0.0165***		
		(0.006)		
ESR_{t-5}			0.0197**	
			(0.025)	
ESR_{t+3}				0.0073
				(0.337)
Depth	-0.0039	0.0011	0.0053	0.0048
	(0.744)	(0.918)	(0.598)	(0.744)
PTA	-0.001	-0.0013	0.0019	-0.0216
	(0.981)	(0.972)	(0.955)	(0.640)
Pair FE	Yes	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes	Yes
Observations	925,269	880,257	849,638	845,522
R-Squared	0.9935	0.9936	0.9936	0.9935

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at the 5% level; (***) significant at 1% level.

[69] The estimated results for Depth and PTA in tables 2.4, 2.5, and 2.6 are statistically insignificant and suggest the possibility of endogeneity with the NTI variables.

As can be seen, a 1 percent increase in the intensive margin of ESRs is associated with a statistically significant 1.6 percent increase in bilateral trade; where the intensive margin describes the degree of enforceability of a given condition, such that an increase would represent a greater level of legal enforcement for the outlined conditions or an increase in the number of commitments. As expected, the time-adjustment for the trade landscape to NTI policy changes sees the magnitude of ESR conditions increase to nearly 2 percent after 5 years; with a modest increase after 3. Over the 5-year time horizon we can also see that the estimations for the depth and PTA control variables display the expected positive coefficient. The introduction of a three-year lead to the independent variable and control variables yields the expected statistical insignificance: the introduction of an NTI in the year 2000 should not influence the bilateral trade in 1997. EP conditions are equally associated with a positive return to bilateral trade, as seen in Table 2.5.

Table 2.5: NTI Regression Results. Environmental Protection

Variables	$Trade_t$	$Trade_t$	$Trade_t$	$Trade_t$
EP_t	0.0133**			
	(0.044)			
EP_{t-3}		0.0169***		
		(0.004)		
EP_{t-5}			0.0190***	
			(0.002)	
EP_{t+3}				0.0023
				(0.721)
Depth	-0.0050	-0.0034	0.0004	0.0100
	(0.704)	(0.766)	(0.973)	(0.493)
PTA	0.0001	-0.0027	0.0004	-0.0166
	(0.998)	(0.942)	(0.991)	(0.720)
Pair FE	Yes	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes	Yes
Observations	925,269	880,257	849,638	845,522
R-Squared	0.9935	0.9936	0.9936	0.9935

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at the 5% level; (***) significant at 1% level.

The estimated effect on bilateral trade of a 1 percent increase in the intensive margin of an EP NTI at time t is 1.3 percent. This grows to 1.9 percent after 5 years. Where EP measures are concerned, the Porter hypothesis (PH) provides the best theoretical insight for explanation. Whilst there is an associated cost with environmental protection (Butler, 1992), the PH proposes that environmental policies induce technological innovation that, in turn, fosters international competitiveness (Porter and van der Linde, 1995). The resultant intersection between production and environmental protection engenders the promotion of technological advancement and market competitiveness (2007). Whilst these results run at odds with the findings of Berger et al. (2018), they do align with the findings of Costantini and Mazzanti (2012) wherein environmental policy yields positive economic outcomes. Table 2.6 details the estimations for the Civil and Political Rights (CPRs) conditions.

Table 2.6: NTI Regression Results. Civil and Political Rights.

Variables	$Trade_t$	$Trade_t$	$Trade_t$	$Trade_t$
CPR_t	0.0120*			
	(0.080)			
CPR_{t-3}		0.0121*		
		(0.050)		
CPR_{t-5}			0.0186	
			(0.142)	
CPR_{t+3}				0.0061
				(0.363)
Depth	0.0058	0.1420	0.0164	0.0089
	(0.649)	(0.183)	(0.103)	(0.543)
PTA	0.0057	0.0080	0.0114	-0.1910
	(0.896)	(0.828)	(0.736)	(0.676)
Pair FE	Yes	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes	Yes
Observations	925,269	880,257	849,638	845,522
R-Squared	0.9935	0.9936	0.9936	0.9935

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at the 5% level; (***) significant at 1% level.

Following the trend across CSR and EP estimations, a one percent increase in the intensive margin is associated with a boost to bilateral trade of 1.2 percent in time t. This increases modestly when a time lag of 3 years is introduced and grows to 1.8 percent after 5 years. Unlike the previous two index estimations, the 5-year lag is statistically insignificant. The removal of the labour-market distortions associated with ESR and CPR inclusions appear to result in a boost to economic activity, as opposed to acting as a constraint upon it. As with ESR conditions, the trade-linked standards arguments appear prevalent to the explanation for their positive estimations. Where labour standards are concerned, the inclusions are based on the ILO core labour standards (Artuso and McLarney, 2015) as a means to ensure that they do not unfairly harm a developing nation in favour of a developed one (Stern & Terrell, 2003).

These results align with the work of Häberli et al. (2012), who identified a positive relationship between the higher labour standards and economic performance in developing nations. The logic contends that economic development is contingent on social development in the long run, and that this induces a common desire to cooperate with the standards set. In trade arrangements such as the EU's EBA, preferential market access is provided to developing nations on the LDC list under the guidelines that the eligible nations adhere to a number of standards, including human rights and labour rights (EU, 2018). The positive values for these features are indicative of the 'trade-reward' incentive between nations for adhering to a preferred shared vision.

At the core of the NTI impact discussion is the question of competitiveness: do NTI conditions necessarily dampen market competitiveness? The theoretical lines of debate that support a positive conclusion to this question are compelling along static lines. Where country B's market compositeness's is fixed, the imposition of behind-the-border regulatory standards in a trade agreement determined by country A, creates a trading environment where country B is at a distinct disadvantage owed to the costs of alignment. However, in the free market that PTAs stand to promote response is not fixed statically. Domestic producers in country B have every motivation to adapt their productive capacity in line with the new standards to remain competitive globally, and gain from the increased market size with country A. Alignment to the regulatory standards that NTIs entail encourages increased trade flows through increased competitiveness and greater market access: crucial components of a globalised value chain network. Having measured the influence at the aggregate level, it is necessary to identify if there are differences experienced relative to national-income levels. This is motivated by the literature insight that HI nations dictate the inclusion of NTIs on MTLI nations.

Empirical Testing 2: NTIs, Trade, and National Income

Having measured the individual NTI indexes against bilateral trade, this chapter seeks to identify whether the magnitude of the relationship changes with respect to the relevant income levels of the trading partners. Accordingly, trade flow partnerships are characterised four-fold utilising the characterisation set out in Table 2.7. Following the procedure of the first stage of testing each regression is run with a three-year and five-year time lag as well as the time t specification. A three-year time lead is also used to address reverse causality.

Table 2.7: National Income Classification

HI to HI	**MTLI to HI**
High-Income Exporter High-Income Importer	Middle-to-Low-Income Exporter High-Income Importer
HI to MTLI	**MTLI to MTLI**
High Income Exporter Middle-to-Low-Income Importer	Middle-to-Low-Income Exporter Middle-to-Low-Income Importer

The expectation informed by the literature is that trade flows between HI nations are unlikely to be impacted greatly by NTI inclusions due to the expectation of relative regulatory alignment (Berger et al., 2018). By comparison, the expected impact on trade flows between MTLI nations is theorised to be negative as a combination of the costs burden of regulatory adjustment combined with a weaker trade boost from MTLI trade partners. The same motivation for this insight is the expectation that trade flows will be positive between MTLI and HI trading pairs. As in the empirical testing regressions above, results in this section may be interpreted as the heterogenous effects of NTIs set within income classification comparisons. However, it is important to note the statistically insignificant results for depth and PTA in tables 2.4, 2.5, 2.6 may be the result of endogeneity.

Table 2.8 contains the regression estimation between HI trading partners. Conforming with the theory proposed by Berger et al. (2018), the inclusion of NTI conditions, on average, places negligible burden on concomitant trade flows between HI partners. This can be seen in the statistical insignificance of all estimated coefficients; except the ESR conditions at time t. As has been noted, HI nations share a greater degree of regulatory alignment owed to their typically comparable institutional capacity. The introduction of NTI conditions on a market that is already observing the standards as best-practice will not experience a knock to competitiveness; principally because it entails no direct cost imposition.

Table 2.8: Regression Results. Trade Flows between HI Exporters and HI Importers

Variables	$Trade_t$	$Trade_t$	$Trade_t$	$Trade_t$	$Trade_t$	$Trade_t$
ESR	-0.024**					
	(0.041)					
ESR_{t-3}		-0.0034				
		(0.742)				
EP			-0.0169			
			(0.749)			
EP_{t-3}				-0.0013		
				(0.904)		
CPR					-0.0002	
					(0.984)	
CPR_{t-3}						0.0046
						(0.661)
Depth	0.0338	0.007	0.0269	0.0043	0.00002	-0.0013
	(0.111)	(0.707)	(0.285)	(0.845)	(0.999)	(0.935)
PTA	0.1240***	0.1205***	0.1205***	0.1187***	0.0998***	0.1145***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.001)
Pair FE	Yes	Yes	Yes	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	105,210	105,210	105,210	105,210	105,210	105,210
R-Squared	0.9947	0.9947	0.9947	0.9947	0.9947	0.9947

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at the 5% level; (***) significant at 1% level.

Table 2.9 contains the regression estimations for the impact of NTI conditions on bilateral trade flows between MTLI trade partners. Of immediate interest is that when regressed between MTLI nation-pairs only, each NTI index is associated with a negative impact on bilateral trade flows. This stands in contrast to the average positive impact associated with the aggregate NTI estimation, and the regressions between HI and MTLI nations. EP conditions are associated with the largest contractionary impact, whereby a 1 percent increase in the relative legalisation of the index is associated with a reduction in trade of 1.2 percent; growing to 1.5 percent after three years. It is important that estimations for the EP NTI conditions are statistically insignificant in time t but regain significance after three (and five) years. In the same trade-

depressing manner, ESR measures are associated with a reduction in bilateral trade of 0.87 percent and 1 percent respectively, whilst CPRs are identified to lessen trade by around 0.21 percent; growing to 0.53 percent after three years.

Table 2.9: Regression Results. Trade Flows between MTLI Exporters and Importers

Variables	$Trade_t$	$Trade_t$	$Trade_t$	$Trade_t$	$Trade_t$	$Trade_t$
ESR	-0.0087*					
	(0.061)					
ESR_{t-3}		-0.0101**				
		(0.049)				
EP			-0.0119			
			(0.119)			
EP_{t-3}				-0.0150*		
				(0.098)		
CPR					-0.0021*	
					(0.097)	
CPR_{t-3}						-0.0053**
						(0.032)
Depth	0.0081	0.0067	0.0469	0.0143	0.0122	0.0226
	(0.151)	(0.604)	(0.135)	(0.845)	(0.229)	(0.896)
PTA	0.0242**	0.0541**	0.0130**	0.0394**	0.0998**	0.1145**
	(0.032)	(0.023)	(0.034)	(0.013)	(0.049)	(0.011)
Pair FE	Yes	Yes	Yes	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	50,565	50,565	50,565	50,565	50,565	50,565
R_Squared	0.9881	0.9881	0.9881	0.9881	0.9881	0.9881

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at the 5% level; (***) significant at 1% level.

This negative association can be attributed to the cost burden of regulatory best-practice associated with shared-visions promotion through PTAs (Milewicz, 2016). The capacity of developing nations to incorporate and enforce a more rigorous set of NTI features is inhibited by limited capacity and resource

(Campbell and Ahmed, 2012). This places a considerable cost-burden on industry and state whilst simultaneously eroding their international competitiveness (Copeland and Taylor, 2004). In a trade relationship with a HI nation, the cost burden can be offset by the preferential market access and boost to bilateral trade (Fugazza and Nicita, 2010). Traditionally, MTLI nations have utilised trade agreements as an economic growth strategy to boost the export of, typically, primary-commodities and resource-heavy manufacturing, in return for the market access and imports of technologically intensive and high-skilled manufactures from HI nations (UNCTAD, 2006; Bernhardt, 2016).

In the event that such burdensome conditions are incorporated in PTAs between MTLI nations one might consider that their adoption is motivated by the support received from an intra-national working group. Where nations have limited experience in establishing PTAs, they will receive working group support from organisations such as the World Bank, WTO, or OECD to inform and support client countries around data, analysis, and design (World Bank, 2018). In this case, conditionality adoption may be undertaken without adequate understanding as to the trade-stifling effects. It may also be the case that such conditionalities are adopted in preparation for subsequent agreements with nations and blocs that mandate for their inclusion such as the EU.

Whilst south-south trade agreements provide an alternative opportunity for developing nations to enhance economic growth (Amsden, 1989; Lall, 1987), their composition-of-contents tends to be shallower and focused on at-the-border trade-barrier liberalisation (Dür et al., 2014). As such, trade agreements with a high burden of NTI adoption will induce an economic burden that suppresses trade flows between MTLI trade partners who are unable to adequately compensate for market export and technological-import requirements in the same manner as HI trade partners.

The empirical support for this logic can be found in the estimations of results tables 2.10 and 2.11 which display the positive trade boost between MTLI and HI trade associated with NTI conditionalities. All three NTI indexes are estimated to induce a positive trade-flow boost at time t: both for MTLI nations as origin exporters and destination importers. As is expected due to the export-oriented nature of economic growth for MTLI nations unfacilitated by PTAs (UNCTAD, 2001), the associated boost is stronger for MTLI export bilateral trade flows (see table 2.11).

EP conditions are associated with the biggest contribution to increasing trade, where a 1 percent increase in environmental protection legalisation is associated with a boost to bilateral trade of 4 percent for MTLI-HI flows, and 3.4 percent for HI-MTLI flows. As is the case for all NTI estimations within the two tables,

the introduction of a 3-year time lag sees the magnitude drop slightly. Both ESR and CPR conditions are also expected to engender a boost to bilateral trade across both trade directions.

Table 2.10: Regression Results. Trade Flows between HI Exporters and MTLI Importers

Variables	$Trade_t$	$Trade_t$	$Trade_t$	$Trade_t$	$Trade_t$	$Trade_t$
ESR	0.0321***					
	(0.005)					
ESR_{t-3}		0.0289***				
		(0.022)				
EP			0.0342***			
			(0.001)			
EP_{t-3}				0.0335***		
				(0.007)		
					0.0211**	
CPR					(0.083)	
						0.0161
CPR_{t-3}						(0.253)
	-0.0288	0.0184	-0.0493	-0.0024	-0.0157	0.0306
Depth	(0.208)	(0.414)	(0.168)	(0.930)	(0.503)	(0.195)
	-0.4420	-0.0723	-0.0520	-0.0836	-0.0315	-0.0575
PTA	(0.468)	(0.187)	(0.390)	(0.123)	(0.614)	(0.308)
Pair FE	Yes	Yes	Yes	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	213,990	213,990	213,990	213,990	213,990	213,990
R_Squared	0.9932	0.9932	0.9932	0.9932	0.9932	0.9932

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at the 5% level; (***) significant at 1% level.

In total, the regressions incorporating trade-partner development classifications have identified that NTI conditions contained in PTAs have a significant influence on the bilateral trade flow between all partner combinations involving at least one MTLI nation. In line with the findings of the aggregate NTI testing

(Table 2.3), NTIs appear to reinforce a positive trade cycle of preferential market access in return for regulatory alignment across features that support domestic economic stability and productivity. Specifically, ESR conditions that provide labour protection, EP measures that protect, conserve, and innovate the use of national resources, and CPR inclusions that ensure the stability associated with the observance of human rights commitments. Where they have a negative impact is where conditions are present in an agreement involving two MTLI nations. In this circumstance, the associated cost of regulatory alignment is non compensated for by market access.

Table 2.11: Regression Results. Trade Flows between MTLI Exporters and HI Importers

Variables	$Trade_t$	$Trade_t$	$Trade_t$	$Trade_t$	$Trade_t$	$Trade_t$
ESR	0.0383***					
	(0.000)					
ESR_{t-3}		0.0297***				
		(0.000)				
EP			0.0402***			
			(0.000)			
EP_{t-3}				0.0363***		
				(0.000)		
					0.0242***	
CPR					(0.005)	
						0.0201**
CPR_{t-3}						(0.014)
	-0.0128	0.0024	-0.0353	-0.0191	-0.0057	0.0047
Depth	(0.424)	(0.867)	(0.042)	(0.231)	(0.733)	(0.750)
	0.0078	-0.0135	-0.0018	-0.0282	0.0217	-0.0041
PTA	(0.848)	(0.674)	(0.964)	(0.363)	(0.605)	(0.899)
Pair FE	Yes	Yes	Yes	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	605,165	605,165	605,165	605,165	605,165	605,165
R_Squared	0.9912	0.9912	0.9912	0.9912	0.9912	0.9912

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at the 5% level; (***) significant at 1% level.

2.5. Conclusion

The past twenty years has seen a significant increase in the number of NTI conditions utilised within PTA frameworks. These conditions are not directly related to trade (Jones, 2002), and instead mandate for nations to make regulatory adjustments across their domestic procedural and legislative space. Despite their proliferation, our understanding as to their treatment effect on trade flows has remained limited.

The trade literature has tended towards theorising the relationship between NTIs and bilateral trade as a cost burden placed upon less wealthy nations by HI trading partners in return for market access (Bhagwati and Hudec, 1996; Lechner, 2016). The motivation herein concerns the loss of competitiveness by MTLI nations as HI partners seek to maintain their market competitiveness through the imposition of regulatory compliance (Baccini et al., 2016). It has been less clear whether the increased market access would be compensatory against the cost of adjustment, or indeed whether theories on market competitiveness would hold and witness the according adaptation of MTLI markets (Porter, 1990; Porter and van der Linde, 1995; Maskus, 1997).

Utilising Lechner's (2016) NTI dataset and testing within a gravity model framework, this chapter has identified that, on average, NTI conditions are associated with a positive return to bilateral trade. These results are aligned theoretically with the discussions on market harmonisation, shared values, and market access. Instead of inhibiting trade through burdensome cost, they are on average acting to support a more stable production and trading environment, motivated by enhanced market access.

Beyond the aggregate impact of each NTI on bilateral trade, it is important to capture the interplay between HI nations (those who have dominated the rule setting of NTI incorporation) and MTLI nations (those who often must accept the conditions or reject the PTA). Accordingly, regressions were run between combinations of HI and MTLI nations.

The findings of this chapter align with the expectations set out within the literature; where an NTI is included in a PTA between HI trading partners, there is an insignificant impact owed to the relative regulatory alignment already in play. In contrast, where there are NTI conditions in play between two MTLI nations the average effect is negative. This can be explained in terms of the interplay between the costs of compliance and the inherent market access potential. For an MTLI nation NTIs incur a cost to competitiveness. For the aggregate outcome to be positive, they must be compensated for by increase trading opportunity. This can be best seen in the relationship between HI and MTLI nations. Where the bilateral trade flow is between a combination of HI and MTLI nations, NTI conditions are associated with

a positive return to bilateral trade whereby MTLI nations are compensated for greater market access and trade volume.

In order to cast further analytical light on these results, and as a suitable next step in the development of this research space, it would be appropriate to estimate the trade creation and trade diversion outcomes associated with the signing of PTAs with NTI conditionality. It can be expected that MTLI nations outside of a given PTA with NTI conditions will see a reduction in trade with MTLI partners who are signatories to the agreement. This is a general equilibrium effect unaccounted for in this chapter's analysis.

It is however clear from this study that the incorporation of NTIs within PTAs has implications for trading relationships and governance moving forward.

3. Foreign Direct Investment and Trade Facilitation Under Preferential Trade Agreements. The ASEAN Experience.

3. 1. Introduction

Contemporary trade and investment theory require examining the relationship between preferential trade agreements (PTAs) and the global organisation of production. In particular, the increasing contents and character of PTAs has ushered this examination ever further under the microscope of research and policy (Osnago et al. 2019). As such, in this chapter I explore the treatment effect of trade facilitation conditions, as contained within PTAs, on the bilateral FDI stocks between ASEAN nations and the countries with which FDI is undertaken. The results in this chapter are built on a structural gravity model of FDI that is applied to bilateral FDI data from UNCTAD (2014). I control for the heterogeneity and depth of PTAs, as well as additional time- and country- varying bilateral policies. The concept of depth[70] in the literature refers to the extent to which a trade agreement requires a signatory party to depart from the actions and policies they would have pursued in its absence (Grossman, 2016). This applies both to the breadth of coverage (the number of trade factors covered[71]) and the extent to which the provision is substantive and binding[72]. The categorisation of a trade agreement as 'deep' is used in the literature to differentiate them from traditional market access commitment agreements (or, 'shallow' agreements). Chapter one provides significant and additional discussion on the concept of depth and the depth variable employed in this chapter.

Since the beginning of the 1990's, international trade has been increasingly governed by the remarkable uptake of PTAs (see Figire 1.2). Concomitantly, the depth and scope of these agreements has continued to grow (Dür et al., 2014; Hofmann et al., 2017). Far from being concerned by the trade of goods alone, PTAs have reached into the realms of public procurement, services, intellectual property, environmental regulation, and investment (to name a few). Whilst the stimulation of bilateral trade remains a core driver for their ratification in the first instance, such scope of coverage necessarily begins to drive change in these

[70] The works of Dür et al. (2014) and Hofmann et al. (2017) represent the two most comprehensive categorisations of depth as a conceptual model.

[71] Factors here include chapters on trading relations around service, investment, intellectual property rights, procurement, technical-barriers-to-trade (TBT), sanitary and phytosanitary (SPS) measures, dispute settlements, trade remedies, and competition.

[72] For example, in the case of intellectual property rights, does the text outline a firm commitment to adopting international standards, or does it note an intention to pursue better practice.

areas. Of particular interest to the contemporary context of international trade, comprising multinational overture and sweeping global supply chains, is the interrelation between trade and investment. Despite investment provisions often being incorporated within PTAs, the impact is far from clear. Trade and FDI, by their very nature, can either complement or substitute each other: contingent on the motivation behind the investment, the industry, and the specific design of the PTA under which the FDI is governed.

From a theoretical perspective, horizontal FDI (the replication of domestic activities by an entity operating in a foreign market) is associated with the FDI substituting for trade. Accordingly, if the motivation underpinning FDI is foreign market replication, PTAs would be expected to reduce FDI flows. By comparison, vertical FDI, where a firm will split its production activities between different geographical locations, is expected to create a complementary relationship between trade, FDI, and PTAs (Markusen, 2002). In addition to the foundation vertical- and horizontal- FDI theories, several motivations for FDI have been postulated; these have largely been motivated by the expansion and complexity of global value chains (GVCs) in recent years. For example, export-platform FDI (Ekholm et al., 2007), complex FDI (Baltagi et al., 2007) and the concepts of horizontal-ness and vertical-ness (Baldwin and Okubo, 2013).

With respect to the motivations underpinning FDI, as they relate to the utilisation of a PTA, the work of Lawrence (1996) and Baldwin (2011) find that the depth of a PTA is correspondent with the international fragmentation of production, such that trading conditions are permissible to assemble components along a larger global value chain. Running in parallel to this is the works by Dür et al. (2014) that identifies the trade enhancing effects of deeper trade arrangements. Hereby, we can identify a pattern whereby more nations have taken on more PTAs, that have themselves increased in depth and scope, and facilitating a fragmentation of production, in addition to motivating greater volumes of trade. At the firm level, these outcomes whereby the opportunities presented for growth increase as foreign markets open up for business, therefore create a choice dynamic as described above; to fragment production for efficiency, or to replicate facilities for foreign market presence. Adding to the complexity of theorising the relationship between PTAs, trade, and FDI, is the increasingly important discussion around trade facilitation; which refers to the simplification of trade regulations in a procedural and administrative regard at the border.

Where trade facilitation has received the most attention was in the wake of the WTOs Trade Facilitation Agreement (TFA). The TFA entered into force in 2017 following ratification and contains provisions for expediting the movement, release and clearance of goods, including goods in transit. It also sets out measures for effective cooperation between customs and other appropriate authorities on trade facilitation and customs compliance issues. It further contains provisions for technical assistance and capacity building

in this area (WTO, 2021). The according simplification, modernisation, and harmonisation of export and import processes, hereby facilitates increased trade both in scale and variety (Persson, 2012).

Whilst the relationship between trade facilitation and trade is clear, how trade facilitation affects other areas of economic activity, with respect to bilateral or plurilateral agreements, has received considerably less attention. A 2017 report by the Global Alliance for Trade Facilitation (GAFTF) found that improving the trade facilitation environment by 1 percent corresponds with a 3.2 percent increase of FDI into manufacturing. However, the authors noted that their correlation methodology was not robust enough to prove causation. In addition, the disaggregated capture of manufacturing FDI alone fails to provide much by way of insight for the general case. It is however a motivating starting point. Accordingly, this chapter focuses on the bilateral effects of trade facilitation conditions, contained within PTAs, on foreign direct investment. This chapter contributes to the body of research by examining how the trade facilitating content of PTAs impact bilateral FDI flows, specifying for the ASEAN region and its trading partners.

The underlying logic is that trade facilitating provisions contained within an agreement will affect a firm's decision-making process when it comes to export, subcontracting, and relocation strategies. The result of this decision process determines whether, at the aggregate national level, there is an increase in trade or investment.

In the context of chapter three, the ASEAN region deserves specific attention for two main reasons. (1) the bloc is a leader in preferential cooperation from a development perspective. It continues to utilise the ASEAN mechanism to foster peace, stability, and economic growth and development. Accordingly, the ability to understand the regional features that support this success are of scholarly interest. Secondly, FDI has played a crucial and formative role in the region.

The remainder of this chapter will go on in Section 3.2 to examine the literature exploring the conceptual background and theoretical underpinnings of trade facilitation measures, before reviewing previous literature on the intersection between PTAs and trade facilitation. The literature section will conclude by exploring the theories surrounding trade facilitation and foreign direct investment and offering a case for the importance of the ASEAN region to this application. Section 3.3 will explore the methodological development of the gravity model with respect to its application against FDI. Section 3.4 shall provide an overview of this chapter's dataset and the results from the gravity model analysis of TF conditions in PTAs upon FDI flows. The chapter shall conclude with a summary of insights in Section 3.5.

3. 2. The Interplay Between Trade Facilitation and FDI

Contemporary global trade has witnessed complex global value chains multiply as multinational spread has seen individual nations, or groups of nations, specialising in the manufacture of a single component of a final product (GAFTF, 2017). In fact, half of all world trade in goods and services takes place within global production networks (WTO, 2015). In order for a production line that is spread across multiple nations to function effectively, smooth and predictable cross-border trade is highly preferable, if not completely essential.

Trade facilitation is the mechanism that encapsulates the various processes aimed at clearing goods across borders as quickly and predictably as possible. As production becomes more sophisticated and inter-dependent, the efficiency and predictability of cross-border trade becomes ever more important. Countries must be able to keep up with the increasing need for timely, reliable, and predictable trade, especially if they seek to attract foreign investment.

In fact, countries that implement trade facilitation reforms, and therefore enhance trade efficiency and connectivity, are generally expected to attract more trade and FDI (Duval and Utoktham, 2014).

A crucial mechanism for governing the incorporation, implementation, and effectiveness of trade facilitation conditions is the PTA. The positive economic prospects associated with an increase to a nation's FDI portfolio (both inward and outward) are recognised to be a primary motivator for the entering into of a PTA in the first instance (Medvedev, 2012). In large part, this is associated with the noted reality in global trading relationships where, increasingly, trade is taking place within an integrated supply network between multiple nations (WTO, 2015).

This is the outcome triggered by firms in advanced economies leveraging profits through the offshoring of production processes to developing countries (OECD, 2013). Conceptually, these gains from the dispersed fragmentation of supply chains can be associated with the difference in factor intensity of different production stages, and the relative factor costs of those stages across and within countries (Park et al., 2013). Accordingly, this process of globalisation has seen a concomitant rise in the growth of both trade and FDI (Thangavelu and Findlay, 2011); increasingly set within a framework of preferential trading relationships (Hofmann et al., 2017).

This section reviews the literature covering the interplay between PTAs and trade facilitation, as well as that covering FDI, trade costs, and bilateral trade, in order to outline a theoretically sound picture of the anticipated effects of trade facilitation on bilateral FDI.

3.2.1. FDI and Trade

The literature exploring the relationship between trade and FDI is extensive and covers ground from the factors affecting firms' decisions to forgo export in favour of FDI (Helpman, 2013), to the role of FDI in alleviating domestic poverty (Oh, 2014). A useful conceptual starting point, to understand the complementary relationship between FDI and trade, is the theory of proximity-concentration trade-offs, proposed by Brainard (1997).

The theory proposes that firms exist in imperfect markets where there are trade-offs between the fixed costs of location and the variable costs of exporting to foreign markets. Accordingly, firms must weigh the cost and benefit of several decisions in the delivery of their final good. For example, a firm may locate production in its primary export market to avoid the trade costs associated with exporting; however, this must be weighed against the opportunities associated with developing larger production facilities to take advantage of increasing returns to scale. Accordingly, firms can decide to either; a) pull out of the foreign market, b) export to the foreign market exclusively, or c) invest in a foreign production facility to serve that specific market (FDI).

Ultimately, the decision is made on the relative costs associated with the mode of foreign market access that will determine whether firms engage in export's only, or to invest in a foreign market (Gao, 2009). Summarily, exporting involves lower fixed costs, whilst FDI involves lower variable costs: relative to exports, FDI saves transport costs, but duplicates production facilities and therefore requires higher fixed costs.

Helpman et al. (2004) outline that (all else remaining equal) an export strategy is more profitable for low-productivity firms; whilst high-productivity firms are better suited to an investment strategy abroad. Gao (2009) meanwhile notes that trade and FDI are complementary unless there is a considerable information asymmetry or barriers to entry.

Of note to this chapter, the purpose of trade facilitation conditions is primarily for the purpose of reducing information asymmetry and, resultantly, eroding barriers to trade and subsequent investment. In addition

to the proximity-concentration trade-offs that underline a firm's investment decision, there are several internal (firm-level) and external (market-level) factors at play.

An early theoretical strand begins in the FDI literature with the work of Dunning (1977), who brought together the theories of economics, ownership advantage, and internationalisation theory to create the Ownership, Location, and Internationalization (OLI) framework. These three factors represented, at this time, the core advantage drivers available to firms. Ownership advantages refer to the multinational-specific assets that allow it to overcome the costs of operating in a foreign country, such as new technologies or pioneering management infrastructure. In contrast, Locational advantage refers to the location-specific factors that makes the area suitable for a multinational to operate in. Finally, Internationalisation advantages describe the factors that make it more profitable for a firm to undertake transactions internally, rather than export arrangements.

Advancing on the notion of internationalisation, Dunning (2000) distinguishes between four main motives for FDI. Firstly, *market seeking* motives whereby FDI is for the purpose of supplying the local market. The host market size, consumer demand, and income per capita, are the driving forces behind this form of FDI. FDI is expected to be higher where destination markets are larger and have a higher income per capita. Secondly, there are *resource seeking* motivations for the purpose of obtaining cheaper factors of production. *Efficiency seeking* motivations refers to where FDI is designed to promote a more efficient division of labour or specialisation of assets. Finally, *strategic asset seeking* motivations that see multinationals seeking strategic resources (skilled workers, new technology, etc.) that can support the development of the firm.

These motivations lead into the dominating theory of contemporary FDI theoretical analysis, the knowledge capital model developed by Markusen et al. (1996) that was later applied to the theories of multinational enterprise by Carr et al. (2001), drawing on the assumptions of fragmentation, skilled-labour, and jointness. Fragmentation refers to the ability for business operations to exist simultaneously in different geographical locations. For example, a research and development (R&D) arm could be based in Stockholm, whilst production of a major component could take place in Ho Chi Minh City. This allows for organisations to apportion their operations in cost effective locations relative to the required inputs; locations for which there is a comparative advantage in that specific input. Where the R&D activities are often skilled-labour intensive, with respect to production, it will more often take place in the source country. However, the insights and research developed through the R&D process, that go on to inform the processes and products of the entire operation, are presumed to be replicable across multiple production sites. This is the jointness of the model; the interlinkage between operational nodes across multiple geographical locations. Trade

costs are likely to be a determining factor when a business comes to deciding whether it should fragment its operation and is looking for suitable foreign markets to invest in. As such, the relationship between trade costs and FDI is ambiguous; if trade costs are high, it is more beneficial for the organisation to invest in production facilities abroad and keep R&D local. Similarly, if trade costs are lower, the operation may favour producing abroad if it is cheaper to produce and export from the foreign market (Neary, 2009). Accordingly, the decision to export or invest might be predicated on the proximity-concentration trade-offs, as motivated by strategic decision making around the OLI framework, and the four motivations of FDI.

Necessarily, a large contributing factor to this decision-making process is the accessibility of a given foreign market, in relation to the home market. Herein resides a deterministic role of the PTA. The knowledge capital model[73], and the motivations proposed by Dunning (2000), sit themselves within a framework for examining FDI that draws from New Trade Theory. In this model multinational firms are incorporated into the general equilibrium trade models (Camarero et al., 2019). This branch of theory proposed the existence of two defining forms of FDI; horizontal (market-focused) and vertical (export-focused).

The dichotomy of FDI motivations is important to acknowledge when measuring the impacts of changes in trading relationships on FDI flows. On one hand, the FDI model sees investment for the greater purpose of export and, therefore, trade in goods set within the established trading relationship of the exporter and importer (vertical-FDI). Whilst, on the other hand, we have a form of investment that focuses on the establishment of one's enterprise in a foreign market to trade internally in absence of inter-nation trade conditions (horizontal).

Following through the logic outline in the chapter thus far, and in aggregation of the previously discussed theory, the outcome opportunities of trade facilitation conditions on FDI will be summarily reviewed against the literature examining horizontal and vertical FDI; as well as the subsequent literature reviewing knowledge-capital FDI. The purpose of which is to provide an explicitly clear theoretical framework to understand FDI in the context of trading relationships and, subsequently, the expectations for FDI around trade facilitation inclusions.

[73] The knowledge-capital model has recently been extended to explain other forms of FDI such as export-platform FDI (see Bergstrand and Egger (2007); Ekholm et al. (2007)) which is used to serve the neighbouring markets of the host country. These studies highlight the importance of considering regional trade agreements in the empirical approach.

Horizontal and Vertical FDI

When a firm is planning to extend its business abroad it is typically afforded two options; it can either export into the foreign market or undertake horizontal FDI. Where a firm undertakes the latter, ultimately duplicating its production facilities in a foreign market, it is able to save on tariffs and variable costs such as transportation, insurance, and storage (Bae and Jang, 2013). Its potential loss in this instance is against the requirement to pay trade variable costs for each export (Camarero et al., 2019). Overall, as noted by Bae and Jang (2013) the relationship between exporting and horizontal FDI can be expressed as the trade-off between economies of scale and tariff-jumping strategy. In addition, it can be explained through the aforementioned proximity-concentration hypothesis that implies horizontal FDI can be considered a substitute for export of goods (Helpman, et al., 2004; Greenaway and Kneller, 2007).

In the instance of PTAs that reduce trading costs through coverage, depth, or trade facilitation conditions, a firm would therefore be expected to export rather than undertake horizontal FDI due to the greater benefit from economies of scale set against a more stable and predictable trading environment. In contrast to this theoretical proposition, Blomstrőm and Kokko (1997) outline that a PTA can alternatively engender increasing horizontal FDI as a result of expanding the common market between member countries and fostering an FDI-friendly economic environment by including investment provisions. As well as this, Irarrazabal et al. (2013) highlight how multinational firms can trade internally between home and foreign-market branches. Resultantly, despite a reduction in trade costs brought about through the PTA, horizontal FDI can still increase because the firm can more easily send its key components to its overseas affiliates in countries partner to the trade agreement.

This strand of thought has been captured in the empirical literature as well. Head and Ries (2004) found that there is a complementary relationship between exports and horizontal FDI present in vertically integrated firms. In theory this all suggests that the impact of a PTA, and trade facilitation measures, on horizontal FDI is dependent on whether FDI is a complement or substitute for exporting. Of course, the relationship between horizontal FDI and exports depends on the types of goods and the characteristics of home and host countries.

The case for vertical FDI is rather straightforward; where a multinational enterprise utilises vertical-FDI to pursue production activities in a host country with relatively low production costs, the relationship between trade and FDI is complimentary (Helpman, 1984; Helpman and Krugman, 1987).

The Knowledge-capital model

It is more often the case that data limitations and information asymmetry make it impossible to discern whether FDI is horizontal or vertical. The according dataset for this chapter therefore contains FDI values aggregated at the country level which conceptually speaks nothing to motivation. Accordingly, the knowledge-capital model is drawn upon to outline the expected theoretical assumptions from which to draw hypotheses for FDI flows in the presence of trade facilitation conditions. The model was proposed by Markusen and Venables (1998) and was motivated by the acknowledgement that horizontal and vertical FDI is mixed up together in the country-level FDI data. It concerns the factors that affect FDI such as the economy sizes of home and host, the difference in factor endowments, barriers to investment, and trade costs. Herein, for the purpose of this chapter is the theoretical suitability whereby trade facilitation can be considered the logical next step of reduction to trade costs.

The Knowledge-Capital model proposes that horizontal FDI will increase with the sizes of home and host economy and economic similarity between the two countries. On the other hand, vertical FDI rises with the difference in factor endowments or the levels of skill between the two. Carr, et al. (2001) empirically test the Knowledge-Capital model and show that FDI is significantly affected by economic size and similarity, the difference in factor endowments, and barriers to investment. They draw a conclusion that the effects of trade costs on FDI depend on the difference in factor endowments between countries, finding that trade costs are more likely to increase aggregate FDI by stimulating horizontal motives, especially when the difference in the factor endowments is small. On the other hand, trade costs negatively affect aggregate FDI by constricting vertical motivation when the difference in factor endowments is large.

Drawing on the insights from the presented theories and studies, this chapter investigates the relationship between trade facilitation and FDI.

3.2.2. Trade Facilitation

The precise definition of trade facilitation can vary and is dependent upon the circumstance of its employment and the actors employing it (Hammenfors, 2016). In a narrow sense, trade facilitation measures are associated with the simplification of trade regulations in a procedural and administrative regard at the border; often referred to as reducing the red tape. In a broader sense, it regards all implicit and explicit trade facilitating mechanisms that would facilitate the use of more advance customs procedures; including implementation of a single-window system, advance rulings, and use of international standards (WTO, 2015). Perhaps most succinctly, trade facilitation is the simplification, modernisation, and harmonisation

of export and import procedures (WTO, 2021). In this context, trade procedures are regarded as "the activities, practices and formalities involved in collecting, presenting, communicating and processing data required for the movement of goods in international trade" (WTO, 1998 cited Grainger, 2008). The importance is derived in the significance of developing trade facilitating governance mechanisms for the purpose of fostering a relationship between regional cooperation and the reduction in trade costs (OECD, 2019).

The reduction in trade costs is of particular significance in the context of this chapter.

From a theoretical perspective, when the time taken for trade is suboptimal there is a delay that results in costs for the trading partners. This cost imposes a wedge between the price received by the exporter and the price paid by the importer, resulting in a domestic import market price set above the world price, and ultimately depressing demand. If this cost was imposed by a tariff imposed on the importer, the deadweight loss would be partially offset by government revenue and the presumed social benefit this brings. However, in the case that the cost is caused by non-tariff trade procedures, the costs are a pure loss (WTO, 2015). These costs are directly related to the administration and supply of information at the border, and indirectly related to the value of the traded good, since inefficient border procedures causes procedural delays and lost business (OECD, 2002).

"Regional cooperation on customs and the facilitation of trade goes hand in hand with preferential trade liberalization" (Maur, 2011). In order to ensure that trade creation is achieved with a preferential trade regime, there is a requirement for specific customs arrangements and a considered level of cooperation between trading partners at the border. The concept of national cooperation to facilitate international trade goes back to antiquity, and the notion of planning failures is longstanding. Regional trade facilitation efforts are thus not a new idea, but rather have evolved to take on new dimensions in an increasingly globalised setting. Of particular importance to the modern context is the intersection at play between two concurrent dynamics; the modern proliferation of PTAs, and the international acknowledgement of a need for suitable modern border management tools (McLinden, 2011). Conceptually, this lends itself to the theories on 'New Regionalism' where co-operation through PTA mechanisms aims to strengthen structural economic reform, aid economic transformation, and attract foreign investment; with the aggregate intention of enhancing the region in question's economic competitiveness on the global stage, leveraging the individual and collective strengths of the signatory group (Sohn, 2004; Leu, 2011). In order to achieve the intended outcome of deeper integration it is of course necessary to reduce the trade frictions present between partners.

Also referred to implicitly in the language of 'trade procedures', trade facilitation conditions seek to minimise the frictions associated with the customs practices and documentary requirements that are imposed on goods crossing national borders (Olofsdotter and Persson, 2013). Globally, customs protocols and practices involve the use of information technology, use of computerised container scanning, risk management techniques, and bureaucratic structures to address the potential pitfalls of corruption. Where documentation requirements are concerned, border agencies require such paperwork as insurance certificates, carrier declarations, and certificate of origin. Where such requirements are more standardised, simplified, and harmonised, it can be expected that processing time will be reduced (through a more streamlined process) and confidence at the border will increase (through the reduction of information asymmetry); resultantly birthing concomitant reductions in administrative border costs and increases in cross-border transactions by volume.

By comparison, the outcome of inefficiencies in the import and export procedures of a given nation is the rise in direct costs to the trading firm; owed to the requirement put upon them to devote additional resources for compliance with the procedures[74]. In addition, the imposition of unnecessarily complex, or inconsistently maintained, procedures often result in the accruement of both direct and indirect trade costs. These costs manifest in a number of ways including: depreciation of goods stuck in transit that are subject to rapid loss of market value such as advanced technologies; storage costs as a result of inability to ensure quick transit; and the loss of business opportunities due to uncertainty around delivery times and transit. As defined by Anderson and van Wincoop (2004), trade costs are all costs involved in getting a good to the end user, other than the marginal cost of producing the good itself.

From a trade facilitation perspective these costs can be considered to relate to all governance and regulatory frictions that result in a direct cost on production, transport, or consumption including freight insurance, customs delays, and unofficial payments. All associated costs along these lines form a barrier to trade that prohibits the optimal level of trade and investment between partners; resultantly imposing unnecessary and artificial costs. It is perhaps no surprise that governance and customs procedures have emerged as two of the key soft-infrastructure mechanisms requiring address for enhanced trade and integration (Mirza and Bacani, 2013; Kingombe, 2014). Governance refers to the institutions and processes where collective decision making is made (Khan, 2004), whilst customs procedures define the decisions, authorisations, and

[74] For example, the imposition of unofficial border payments. Where procedures and regulation are as poorly enforced as to motivate such payments, they have a direct cost on the exporter and importer. This cost can be in the sum total amount of the payment, or in the time taken to resolve the payment issue.

processes undertaken by a sovereign nation, or region, required for market access by a trading partner[75] (UNECE, 2014).

As identified by Alburo (2008), institutional coordination around customs and governance procedures is necessary to maximise trade facilitation outcomes. Whilst tariff rates have traditionally dominated the discussion as to market access, trade facilitation around procedural lines has emerged as the key instrument for reducing trade costs. In particular, soft cross-border infrastructure is seeking to improve the coordination between customs agents and streamline the procedures that can be a major source of economic drag. Of course, the implementation of these mechanisms is a source of complexity owed to the need to overcome different laws and regulations between trading partners. This is a politically sensitive area, especially for developing nations who may perceive the harmonisation of policy in the region with a loss of sovereignty. The process therefore requires a strong economic, political, and business case for the proposed developments, backed by a clear, transparent, and unambiguous agreement between the relevant parties; a preferential trade agreement (as will be studied in this chapter) or a multilateral arrangement such as the TFA ratified by the WTO in 2017 (WTO, 2021).

When it comes to defining trade facilitatiom explicitly for the purpose of measurement there is the ability to define broadly for the incorporation of all conditions relating to harmonisation around governance and process of export and import processes. In a narrower and more precise sense, however, a definition for trade facilitation can be reflected in the parameters defined by the WTO's TFA. With respect to PTAs, trade facilitation conditions can therefore be considered to be any conditions or articles that map with the respective conditions and provisions covered by the TFA[76].

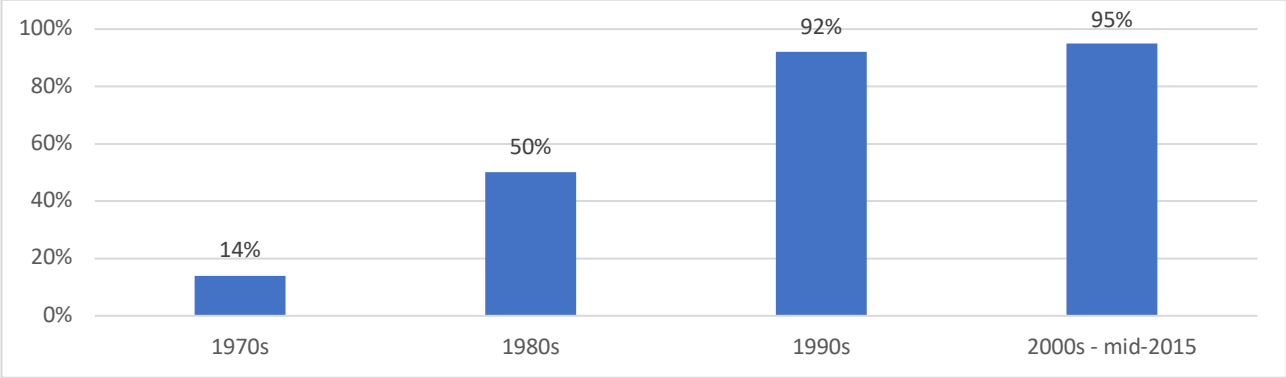
The TFA entered into force in early 2017 and contains provisions for expediting the movement, release and clearance of goods, including goods in transit, in addition to setting out measures for effective cooperation between customs and other appropriate authorities on trade facilitation and customs compliance issues (WTO, 2021). The implementation of the TFA is expected to reduce trade costs by an average of 14% and increase product diversification between 12% and 28% (GAFTF, 2017). The same report also highlights a strong link between a country's trade facilitation environment (how quickly and predictably goods are

[75] As noted in the case of the European Single Market Act, customs procedures consist of presenting the merchandises at the customs office and allotting customs duties. The customs administration only allows certain persons to perform the customs clearance, these can be: the merchandise holder; the professional declarant: the authorised customs agent who is in charge of fulfilling the customs clearance formalities for his client. The forwarding agents can often act as customs agents; other declarants who have been entitled with an authorisation to perform the customs clearance.

[76] The full list of inclusions can be found in appendix C2.

cleared across borders) and the level and number of greenfield FDI projects, estimating that improving the trade facilitation environment by 1 percent corresponds with a 3.2 percent increase of FDI into manufacturing. The comprehensiveness of trade facilitation provisions contained within PTAs varies across agreement but has increased over time, as to have the number of agreements containing such conditions. As can be seen in figure 3.1 below, during the early stages of PTA adoption relatively few agreements contained conditions covering trade facilitation mechanisms. This is the result of the limited focus of early-PTAs around tariff reduction, quotas, non-discrimination, and balance-of-payment (Lechner, 2016). Subsequently, as PTAs proliferated during the 1990s so too did the inclusion of trade facilitation conditions. Further details on the role that date of entry has played is contained in Table 3.1.

Figure 3.1: Preferential Trade Agreements Containing Trade Facilitation Components (as a % of total agreements)



Source: Lechner (2014; 2016)

The importance these 'non-tariff barriers' for overall trade transaction costs has been well established. Rooted in an extensive review of the gravity model literature, Anderson and Van Wincoop (2004) measured that tariff-equivalent trade costs amount to approximately 170% of the ad valorem tax equivalent for industrialised countries[77], while tariff barriers only accounted for around 8%. In addition, many studies undertaken since 2000 have identified the trade cost reduction benefits of trade facilitation measures (WTO, 2015). Furthermore, there is research to show how preferential agreements support a greater efficiency and uptake of trade facilitation mechanisms, and can complement global and national approaches. As noted by Maur and Shepherd (2011), trade facilitation is a potential source of trade gains, whereby its increasing inclusion in PTAs and the interplay between regionalism and trade facilitation is "likely to be a significant feature of the international economy in years to come."

[77] The result is constructed as a representation for a given HI nations' ad valorem tax equivalent. It is measured to include all transport, border-related, and local distribution costs from foreign producer to final user in the domestic country. Broken down, the value represents 55% local distribution costs, and 74% international trade costs.

This increasing attention to trade facilitation may be attributed to the significant reduction in import tariffs achieved over the last two decades, (Caliendo et al., 2017) and to national government's realisation that further trade expansion depends on whether non-tariff barriers can be effectively tackled, including cumbersome import and export procedures. While the impact of including trade facilitation provisions in trade agreements can be difficult to measure, the willingness of governments to systematically include commitments in this area is a welcome development, provided implementation of the provisions do not lead to discrimination against non-members (Hamanaka et al., 2010).

3.2.3. Trade Facilitation and Preferential Trade Agreements

Previously, trade facilitation conditions have remained on the margin of discussion in the literature on PTAs and trade outcomes. This is largely the result of their comparatively recent importance, and the need to examine the initially pervasive questions around outcomes relating to trade creation versus trade diversion (Cernat, 2001; Coulibaly, 2009; Deme and Ndrianasy, 2017; Mattoo and Staiger, 2019), level of conditioned integration (Robinson and Thierfelder, 2002; Dennis, 2006), and more recent explorations of depth and conditionality (Vicard, 2011; Düret al. 2014; Hofmann et al., 2017). However, they have begun to attract more attention in recent years.

As noted previously, the launch of the WTO negotiations in this arena, in concomitance to the increasing role of such measures in contemporary PTA design, evoked scholarly interest. As has been outlined by Neufeld (2014), the evolution of trade facilitation measures in many ways reflect the trends observed in the development of PTAs; such that the expansion of the latter, both in quantity (the numbers signed) and quality (the relative levels of depth and coverage) has been mirrored in their segments on trade facilitation. It is, however, important to note that in other ways trade facilitation provisions have evolved separately, particularly their non-discriminatory nature. For example, the utilisation of a single window portal would provide equal benefit to trade partners out with the trading agreement that stipulated the need for one.

A look at earlier PTAs shows that trade facilitation aspects were almost non-existent (Neufeld, 2016). It was only when governments began to realize the need to expand the trade agenda beyond tariff policies that trade facilitation found its way into PTAs, first in Europe and then in other parts of the world[78]. The launch of WTO negotiations on facilitation in 2004 gave another boost to this trend. Virtually every PTA concluded after that date contain at least some kind of reference to facilitation measures (WTO, 2011).

[78] The now frequent incorporation of TFA conditions was catalysed by the United States and the EU in the 1990s. This was in response to the failing of the WTO, at the time, to institutionalise requirements surrounding trade facilitation.

Many set out a comprehensive set of trade facilitation disciplines. The first attempts to include trade facilitation aspects in PTAs were modest, typically limited to a narrowly defined area of customs reforms. Later agreements expanded their coverage to include areas such as simplification of trade documents and border agency cooperation. The scope expanded further in subsequent treaties, which incorporated measures like risk management, advance rulings, appeal rights, authorised operators, express shipments, single window, temporary admission, or procedures for the rapid release of goods. A look at more recently concluded PTAs reveals an increasingly complex picture. While cross-cutting trends are therefore hard to measure with any precision, Neufeld (2014) has identified several factors that influence how trade facilitation provisions have been incorporated and proliferated in recent PTAs. These are explored in Table 3.1 below.

Table 3.1: Trade Agreement Factors Influencing Trade Facilitation Conditions

Factor	**Overview**
Type of Agreement	Trade facilitation provisions in customs unions typically have a broader scope and a higher level of ambition than those in other regional trade agreements.
Date of Conclusion	Most of the PTAs concluded up to the late 1970s limited themselves to tariff reductions as well as rules on quantitative restrictions, safeguards, balance-of-payment and non-discrimination. This situation slowly began to change in the 1980s when trade-facilitation-specific provisions occurred more frequently in PTAs, albeit limited in scope and mostly aspirational in nature. By the early 1990s, trade facilitation had become a recurrent feature of regional trade accords; and by the end of the decade, the vast majority of all PTAs (92%) set out at least some kind of trade facilitation reforms, reflecting the growing importance of Facilitation at the regional level. This trend intensifies even further after 2000 when regional trade agreements almost always contain a trade facilitation component.
Launch of WTO Negotiations on Trade Facilitation	The start of WTO negotiations in 2004 added a significant boost to this trend. The majority of PTAs concluded after that date contains provisions on trade facilitation. In Asia, for instance, 90% of the PTAs signed between 2005 and 2011 include such measures (compared to less than 25% between 1975 and 2004.)
Level of Development	The parties' level of development can have an influence as well. While there is a certain tendency for trade facilitation provisions in developing country RTAs to be somewhat less ambitious than those in developed-country agreements (although this is not always the case).

Special Interests	Not surprisingly, the key interests of PTA signatories play a role as well. A look at the trade facilitation components of agreements signed by the United States, for instance shows provisions such as expedited shipments, internet publication, penalty disciplines and consularisation. Each of interest in the Washington context.
Geography	Geography also plays a crucial role in the deremation of trade facilitation. Lack of access to the sea, for instance, has been found to have an impact. Transit aspects are more likely to be covered in PTAs that involve a landlocked partner, especially when they share a common border. This tendency is even more pronounced when the country with no sea access has a relatively lower level of development. Geographical proximity of the signatories, on the other hand, does not necessarily have a significant impact on the nature or frequency of trade facilitation provisions. Almost two thirds (63%) of all examined PTAs are not strictly regional. Indeed, the proliferation of inter-regional accords has been especially noticeable over the last 15 years. The majority of the most recent treaties has a broad geographic scope.

The body of literature exploring how trade facilitation impacts international trade is now suitably large (Olofsdotter and Persson, 2013). It embodies ways to define and measure trade facilitation for the purpose of estimating its effect, as noted above. Many papers have confirmed that trade volumes are negatively affected by inefficient trade procedures as a result of imposing both direct and indirect cost burdens, that either dampen or mitigate trade. For example, Djankov et al. (2010) find that for every additional day that a product is delayed, trade is reduced by at least 1 percent[79]. In their research using less aggregated data on trade volumes, Sadikov (2007) and Martínez-Zarzoso and Márquez-Ramos (2008) show that export volumes of differentiated products are more sensitive to trade procedures than export volumes of homogeneous goods. In addition to the volume effects literature, there are a number of studies investigating the effects of trade facilitation at the extensive margin of trade. Inefficient trade procedures are found to be associated with fewer export products (Dennis and Shepherd, 2011; Persson 2012).

Additionally, there have been some recent studies on trade facilitation provisions in PTAs. The earlier studies by Bin Peng (2008) and Duval (2011) employ a broader definition of trade facilitation that includes procedures such as TBT and SPS measures. The broadness of definition described here relates to the fact that these conditionalities fall out with the conditions contained within the WTO's TFA; although they meet

[79] Several other papers support this finding including; Wilson et al. (2003), Nordås and Piermartini (2004), Soloaga et al. (2006), Iwanow and Kirkpatrick (2007; 2009), Lee and Park (2007), Persson (2008), Shepherd and Wilson (2009) and Bourdet and Persson (2012).

the broader definition of trade facilitating mechanisms. More recently, Neufeld (2014; 2016) has focused specifically on the 28 measures outlined explicitly in the multilateral TFA and mapped them throughout 234 PTAs.

This was subsequently made into an index by Duval, Neufeld, and Utoktham (2016) to measure the effects of inclusion against trade cost and multilateral spill overs. They found that TFA-related provisions in PTAs have a statistically significant outcome on reducing bilateral trade costs amongst the agreements signatories, and result in positive multilateral spill overs to trading partners outside the trade-agreement. Overall, the trade cost and trade facilitation literatures offer strong evidence that a streamlining of trade procedures (both at- and behind-the border) are essential to reducing trade costs and facilitating a more conducive trade and investment market. Also reaching into the multilateral context, recent studies have examined the impact of WTO TFA-related measures on trade costs. Moïsé and Sorescu (2013) construct sixteen trade facilitation indicators corresponding to the main WTO TFA provisions and find that implementation of TFA provisions could result in a 16-17% reduction in trade costs. Duval et al. (2015)[80] find that trade costs reductions from WTO TFA implementation in Asia and the Pacific could range from 7% to 11%, depending on the extent of implementation of non-binding provisions.

3.2.4. Trade Facilitation and FDI

There are several channels through which the trade facilitation conditions of PTAs are able to promote increased flows of FDI. Firstly, PTAs reduce or remove export regulations by lowering barriers to trade that facilitate the movement of component, intermediate, or final products between source countries and host countries. In addition, clauses covering investment regulations, technical-barriers, and sanitary and phytosanitary measures, specifically condition for the direct governance and regulation around investment between the parties to the agreement. This works to increase the mobility of capital and funding flows across borders. Such regulations make it feasible for multinational companies (MNCs) to expand their operations out with their domestic operations and to divert financial resources to foreign branches. Following this logic, a nation seeking to boost their inward FDI flow (or indeed, their outward FDI flow) could seek to implement a PTA with an identified FDI source (flow) country.

PTAs are also associated with the development of indirect benefits. Signing an agreement signifies both economic cooperation as well as cooperation on political and institutional fronts, wherein they can support

[80] This study utilises data from a United Nations Regional Commissions (UNRCs) Survey on Global Trade Facilitation and Paperless Trade Implementation, and accounts for the additional trade cost factors identified in Arvis et al. (2015).

signatory nations in the harmonisation of their regulatory and institutional frameworks (Kawai and Wignaraja, 2008). As such, the political legitimacy and binding nature of PTAs support a more secure political and institutional environment for FDI to take place (Büthe and Milner, 2013). As described in the work of Medvedev (2012), preferential liberalisation, in this case through the conditionality around trade facilitation, may affect FDI patterns through three distinct categories: trade liberalisation; non-trade provisions; and market extension.

As regards trade liberalisation, the early literature undertaken by authors such as Dunning (1958) identified how high-tariff rates on imported goods would result in a greater degree of investment into the host market in order to 'tariff hop'. This implies that preferential liberalisation, deepened through trade facilitation conditions, would result in a reduction to investment. However, as has been shown subsequently in the literature[81], there exists great complementarity between trade and investment. This results from the importance of multinational enterprise production, set within an increasingly globalised world, and the resultant intra-industry and intra-trade production networks. In fact, Chakrabarti (2001) shows how market size, openness to trade has been the most reliable indicator of the attractiveness of a location for FDI.

From a non-trade provisions perspective, Adams et al. (2003) pointed to the investment inducing role of deeper integration through non-trade provisions contained within PTAs[82]: investment, liberalisation of trade in services, setting and harmonisation of standards, competition policy, customs cooperation, dispute settlement, and IPR protection. They found that in the majority of cases studied, the conditionality around these features was an important driver of FDI. This can largely be explained through the lens of lower political risk. The work of Kolstad and Tondel (2002) finds a positive association between low political risk and larger FDI per capita; where the risk reduction is owed to a greater degree of regulatory coverage and harmonisation.

In addition to the provisions themselves, be they trade or non-trade in variety, the act of preferential liberalisation creates an extension of the market. Regarding the literature, the relationship between host market size and FDI is well established. Lim (2001) confirms that market size is the most robust determinant of FDI, and this finding is consistent across similar studies (Kolstad & Tondel, 2002). The work of Blomstrőm and Kokko (1997) explains how a larger market facilitates the ability for some firms to grow beyond what they would have been able to achieve in segmented national markets. Alternatively, the

[81] See the work of Caves (1996) and Markusen, (2002).

[82] Broadly speaking, each PTA contains a boilerplate of language that defines the conditions to market entry around quota and tariff access. However, in addition to the baseline expectations, nations are increasingly negotiating additional and specific conditions relating to trade facilitation, environmental protection, and labour laws (to name a few).

competitive pressures found in a larger marketplace induce firms to expand through a process of mergers and acquisitions with former competitors.

Beyond the aggregate understanding of FDI decision making, it is important to consider the choice differences relative to a nation's stage of development[83]. In their paper looking at the complementarity of trade and investment patterns of multinational firms, Markusen et al. (1996) find that horizontal FDI is more relevant to developed countries, whereas vertical FDI is a more relevant investment in developing countries. This can be explained through the outcome factor that vertical multinationals lead where countries are diverse in relative factor endowments. This is supported by the work of Zhang and Markusen (1997) that highlights how vertical multinationals exploit factor-price differences in the world economy and allocate their investments and production accordingly. For the case of horizontal multinationals, they lead where countries are similar in size and relative endowments, and trade costs are moderate to high.

Whilst the aforementioned theories provide a reasonable baseline of insight as to the interplay between FDI and trade decision making in multinationals, there remains a limited consensus as to which variables are most deterministic when it comes to the determination of these FDI flows (Camarero et al., 2019). In beginning to identify such features, Bergstrand and Egger (2007) and Head and Ries (2008) provide theoretical foundations that motivate the use of gravity equations to analyse FDI patterns. The gravity model states that FDI between two countries will be higher where they are the closer (geographically, economically and culturally). Thus, geographical location and the size of the country are key explanatory variables. Kleinert and Toubal (2010) provide the theoretical underpinnings of the gravity equation applied to the analysis of Foreign Affiliate Sales (FAS) showing that gravity equations can be used to discriminate between different theoretical approaches, namely, two proximity-concentration models of horizontal FDI with homogenous (Brainard (1997) or heterogenous firms (Helpman et al., 2004) and a two-country factor proportions model of fragmentation that explains vertical FDI and based on Venables (1999). Heterogenous firms also explain the behaviour of an additional type of MNEs, that is, diversified MNEs. According to the risk diversification hypothesis, firms that are assumed to be risk averse try to spread business risk. Moreover, based on the heterogenous-firm trade theory of Helpman et al. (2004), there have been extensions to explain how these firms expand into overseas markets either through exports or FDI. Overseas production can therefore be a substitute for exporting (see Lankhuizen et al. (2011)).

From the institutional perspective, research highlights the important role played by policy variables (such as corruption, corporate tax rates, tax concessions but also the degree of political rights and civil liberties)

[83] This is of particular interest for the purposes of this chapter as it explores the outcomes within the ASEAN bloc of nations.

together with other fiscal and financial investment incentives on attracting FDI. Deciding about investment in a foreign country requires a multidimensional evaluation. Accordingly, the expectation of earning profit in the country where investment takes place is determined by economic, social and political factors which make FDI a complex issue (Camarero et al., 2019). In the literature examining the institutional quality and FDI relationship, from a theoretical point of view, it is commonly accepted that low institutional quality will negatively affect the investment choices by creating a risk factor. However, the opposite can also occur, as corruption can speed up bureaucratic processes or gain access to publicly funded projects (Egger and Winner (2005). From the perspective of policymakers, it is the factors that determine the nature of the national trade and investment relationship that are of greatest relevance (Duval and Utoktham, 2014). In his review of the FDI literature, Blonigen (2005), promotes five primary factors that impact FDI from a trade perspective: exchange rates, domestic taxes, quality of institutions, trade protectionism, and the complementary effect between trade and FDI. The last of these factors is supported by the emergence of regional and global value chains and the negative effects that trade protectionism has on FDI (Tekin-Koru, 2009).

Before this chapter outlines the methodological approach to capturing the treatment effect of trade facilitation conditions on FDI, it is important to frame the importance of the ASEAN region to this discussion.

3.3. ASEAN

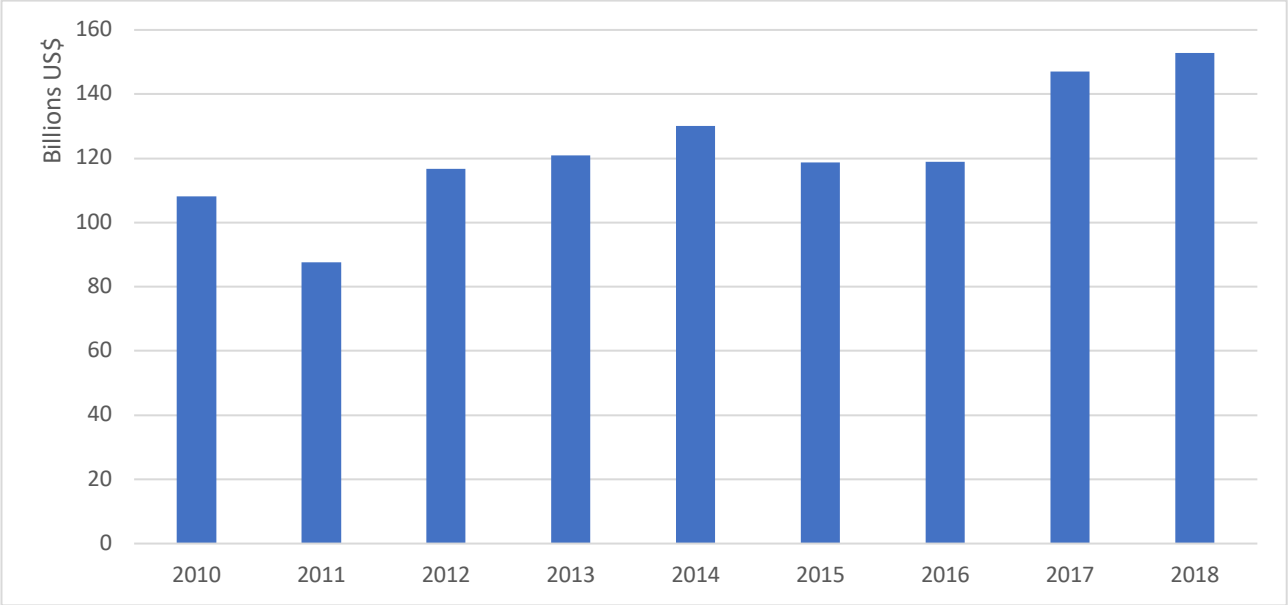
As explored in chapter one, countries in the ASEAN region deserve special attention for two reasons.

Firstly, the ASEAN bloc, and its constituent nations, are the focus of a number of trade agreement negotiations with global economic powerhouses including China, the EU, Japan, and the United States. Additionally, the ASEAN has for many years been considered the most durable and successful regional grouping in the developing world (Hill and Menon, 2010). The early steps of this economic cooperation began in the 1970s with a focus on industrial cooperation. Thereafter, following post-crises recovery in the 1980s, ASEAN took a significant step towards integrating the regional market through the establishment of the AFTA in 1992, and the signing of the AFAS in 1995: working respectively to reduce intra-ASEAN tariffs and establish a basis for services liberalisation in the region. One of the driving forces in the development and growth within the ASEAN region has been the development of PTAs. Cumulatively, ASEAN nations have 54 PTA's currently in force, and a further 8 early announcements in place with the WTO. Following the global patter, early uptake was modest and paced, with no more than one agreement signed a year. Accordingly, the 2000s witness a large increase in formation and signing of various PTAs.

Secondly, FDI has played a crucial role in the economic growth of developing countries in the region; considering the 'flying geese' model of dynamic comparative advantage in the ASEAN (Thangavelu and Findlay, 2011). As can be seen in Figure 3.2, FDI inflows into the region increased for a third consecutive year to reach an all-time high level of US$ 155billion (ASEAN Investment Report, 2019). This represents a global FDI market capture of 11.5 percent. As noted by the same report, this trend is predicted to continue as a result of dynamic industrial developments and improvement of the investment and business environments". In addition, and as outlined in the World Investment Report (2019), the ASEAN benefitted from investment from other Asian economies, particularly China who oversaw investment diversion and relocation of manufacturing activity into the region. Strong intra-bloc investments also contributed to this trend.

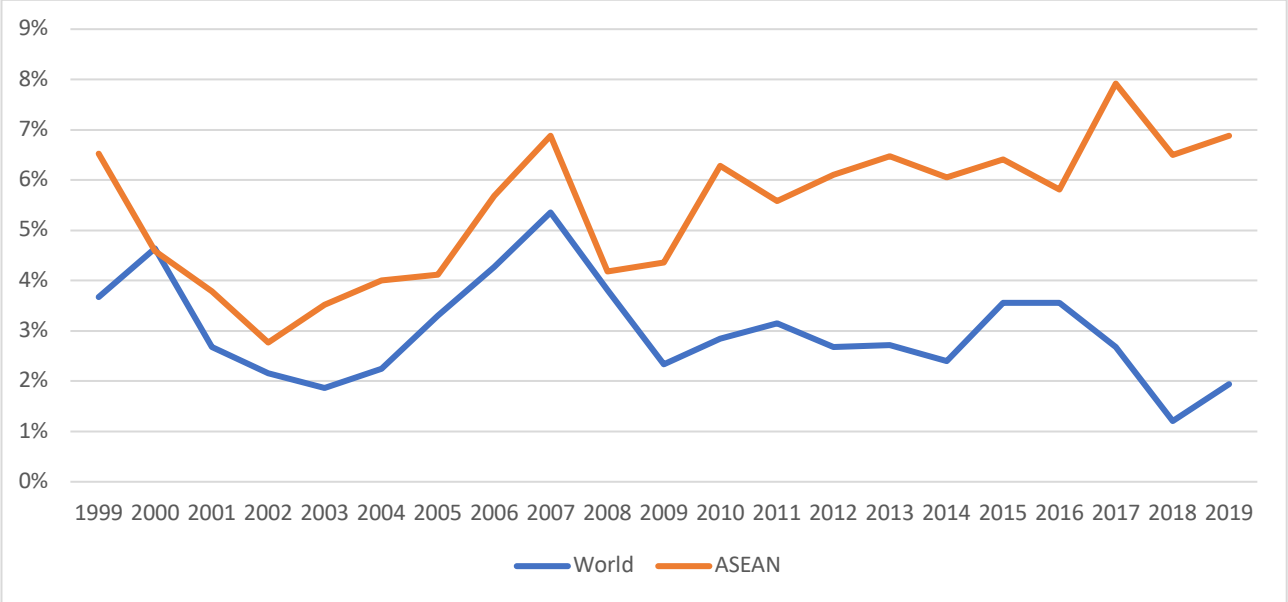
Figure 3.3 highlights the significance of FDI inflows as a percentage of GDP in the ASEAN region. Between 1999 and 2019 the average FDI inflow has remained above the world average year-on-year. Over this time, the Philippines (20 percent), Cambodia (9 percent), Vietnam (6 percent), and Laos (5 percent) have seen FDI as a significant contributor to their economic development. These figures capture FDI inflow for ASEAN countries with all ASEAN and non-ASEAN bilateral investment partners.

Figure 3.2. ASEAN Inward FDI (US$)



Source: ASEAN Stats Data Portal (2020)

Figure 3.3. FDI Inflow (% of GDP)



Source: World Bank (2021)

3.4. Methodology. The Gravity Model.

As is also the case when it comes to the estimation and analysis of factors relating to trade flows, as undertaken in chapters 1 and 2; Jan Tinbergen's (1962) gravity model is a suitable methodology for estimating the relative importance of competing factors when it comes to FDI (Eichengreen and Irwin, 1998).

As noted by Blonigen (2005), the gravity specification fits cross-country data on FDI rather well. In fact, a large body of research has emerged in support of this acknowledgment[84].

At its most basic, the gravity model utilises econometric modelling techniques to evaluate bilateral observations, representing trade and investment flows between countries, across multiple time periods against, what Jan Tinbergen (1962) referred to as the 'gravitational mass' characteristics of explanatory variables that describe the relationship. As noted by DeRosa (2008), "trade and FDI are closely linked, with worldwide investment by multinational firms motivating trade flows and guiding their directions in important ways".

As presented in the literature discussion, the relationship between trade and FDI is both interrelated and contentious. It rests within a network of competing motivations at the firm and macro-economic levels, buttressed by the frictions in play; be these physical, cultural, or policy driven. With respect to this chapter, trade facilitation measures represent additional policy inclusions that work towards removing trade and FDI frictions. They do this through establishing a further concentration of guidelines and norms, proxying for stability, that act to encourage further trade and investment behaviour.

The relationship between FDI and trade has been firmly established in the economic literature (Gao, 2009). Casson (2000) identified that FDI forms a "logical intersection" of the theory of international capital markets, the theory of the firm, and trade theory. This is further promoted in the works of Singh and Jun (1995) and Tanaka (2006), who note that firms may conduct FDI for the specific purpose of 'tariff hopping' and avoiding trade costs. Following the subsequent works of Bergstrand and Egger (2007) and Head and Ries (2008), who established an early theoretical foundation for the gravity equations for foreign direct

[84] As will be explained in greater detail throughout the section, the gravity model posits that the volume of trade and investment between countries depends on a range of inter- and intra-country characteristics. These include and are supported by the works of: market size (Brainard, 1997), the presence of a shared land border and geographic distance (Cuervo-Cazurra, 2008), host country institution (Pajunen, 2008), culture and cultural distance (Dow and Karunaratna, 2006; Huang, 2007), language and religion (Rose, 2004), and the presence of a trade instrument, such as a PTA (Mishra and Jena, 2019).

investment (FDI), research has used a gravity approach to investigate the cross-country pattern of FDI (Camarero et al., 2019). Whilst the approach has delivered interpretable and useful results in the approximation of bilateral FDI flows (Blonigen and Piger, 2014), the debate has continued around the precision of the estimation approach (Camerero et al., 2019).

3.4.1. Theoretical Gravity Model for FDI

The purpose of this section is to outline a theoretically consistent gravity model specification in order to measure the impact of PTAs on bilateral FDI flows. The FDI gravity model specification employed in this chapter is rooted in the recent work of Kox and Rojas-Romagosa (2020); which itself is motivated by the advances of Anderson et al. (2019; 2020).

Regarding the latter, Anderson et al. (2019) established a dynamic model of multi-country trade, domestic capital accumulation, and FDI in the form of non-rival technology capital. Under Armington[85] preferences, the world consist of *N* countries where each produce a single tradable good, differentiated by place of origin. This advance in model specifications facilitates general equilibrium modelling for trade and investment. However, as has been the case for chapter 1 and chapter 2, the focus in this chapter is on the partial equilibrium effects of the trade facilitation conditions contained within PTAs. As such, the adapted model employed by Kox and Rojas-Romagosa (2020) is of interest.

It is of course important to note that this chapter differs from that of Kox and Rojas-Romagosa by introducing specific trade facilitation criteria to identify the role of trade agreement architecture on bilateral investment flows. Specifically, the Neufeld trade facilitation index. It also measures the ASEAN specific experience around inward, outward, and total bilateral FDI flows, as opposed to the global context.

The core model itself is rooted in Jan Tinbergen's (1962) gravity model for trade, for which many of the recent methodological developments hold. The resultant equations for bilateral FDI employs the classical structural gravity form outlined in Head and Mayer (2014):

[1] $$FDI_{ij}^{stock} = \omega_{ij} \frac{\propto Y_i}{P_i} \frac{\beta Y_j}{\Pi_j}$$

[2] $$P_i = \left[\sum_{j=1}^{N} \left(\frac{z_{ij}}{\Pi_j} \right)^{1-\sigma} \frac{Y_j}{Y} \right]^{\frac{1}{1-\sigma}}$$

[85] Each country purchases goods from every available source.

[3] $$\Pi_j = \left[\sum_{i=1}^{N} \left(\frac{z_{ji}}{P_i}\right)^{1-\sigma} \frac{Y_i}{Y}\right]^{\frac{1}{1-\sigma}}$$

Where, in equation [1] the value of outward bilateral FDI from country *i* to be hosted by county *j* is represented by the term FDI_{ij}^{stock}. It is positively affected by the economic size of the country of origin (Y_i) as larger economies tend to invest more in knowledge capital. This reality holds for the traditional north-south (vertical) and north-north (horizontal) patterns of FDI and has been show in recent findings to hold for developing economy investment flows (south-south) (Gonzalez et al., 2017). Similarly, the bilateral FDI stock is also positively impacted by the economic size of the host country (Y_j). This is rooted in the observation that larger economies have a greater number of consumers, firms, and industries that can absorb foreign knowledge-capital. ω_{ij} represents the absolute FDI frictions between origin country *i* and host country *j*. If $\omega_{ij} = 1$, the host country is fully open for the entry of knowledge capital from the origin country. Whilst, where $\omega_{ij} = 0$ there is no permitted admission of knowledge capital from country *i* into country *j*. P_i represents the average of inward friction costs in all destination markets, weighted by their economic mass. A larger P_i is considered to make FDI less attractive and will resultantly lower the volume of bilateral FDI. Finally, there are existing origin market frictions, represented as Π_j. This captures the average outward friction costs of all countries that invest in destination country j.

Both inward (P_i) and outward multilateral resistance terms (Π_j) are, as in the gravity model for trade, theoretical constructs that are incorporated to capture general equilibrium effects that are often unobservable. Their inclusion allows us to estimate the relative FDI friction costs alongside absolute barriers to investment (ω_{ij}), in order to ascertain how much inward FDI a host country can expect to receive from a particular partner country. The multilateral resistance terms are of particular use in providing valuable policy-relevant insights. For example, one could utilise the terms to identify national policies that were most effective in attracting FDI inflows. Alternatively, and off interest to this chapter, one could utilise the terms to identify trade facilitating conditions, contained in PTAs, that are most effective at stimulating both outward and inward FDI flows.

For the purpose of theoretical analysis with respect to the subsequently estimated parameters, the model is rooted in the knowledge-capital literature on FDI (see works by Blonigen et al., 2003; Kristjansdottir, 2010; Chen and Novy, 2011), whereby firms hold proprietary knowledge capital that can be used on a non-rival basis across multiple locations. A firm can increase the value of their knowledge capital by leasing it to outward destinations in the form of FDI.

The free flow of this knowledge capital across national borders is encumbered by both absolute and relative FDI frictions. Absolute FDI frictions are legal and statutory barriers that a country imposes on the access of foreign FDI capital. Broadly, this would include total bans on investment, industry-specific restriction lists, market destination industry-protection that inhibits foreign competition, and comparable access-related policy measures. As outlined by the OECD (2002), the attitudes and policies towards international capital flow liberalisation are subject to controversy; owed largely to concerns about the loss of national sovereignty. Accordingly, and in the presence of uncertainty, domestic governments may take action to restrict inward-FDI through limitations on foreign ownership, screening or notification procedures, management restrictions, and operational restrictions (UNCTAD, 2006).

In addition, relative FDI frictions denote the opportunity costs of operation in a foreign market, when compared against additional foreign market alternatives. It incorporates a number of operational costs, including: physical distance (the cost of transport), infrastructure, communication (the language used), the domestic legal system (enforceability of contracts), government characteristics (ease of doing business), labour costs, corporate tax rate, corruption, and security.

The absolute FDI frictions are considered to precede the relative FDI frictions in the decision-making process through the establishment of constraints that frame the initial choice possibilities for FDI destination choice. For the purpose of this chapter, it is crucial to note that PTAs, and the trade facilitating conditions they contain, can impact both absolute and relative frictions. From the absolute perspective, the absence of a PTA may confer a market access restriction issue where FDI is not possible between home and the targeted foreign nations. By comparison, the presence of a PTA may help to reduce the institutional uncertainty around undertaking FDI in a host market and condition for practices that work to erode relative frictions.

Due to the intangible nature of knowledge capital, they are rather hard to measure accurately. In this chapter, bilateral FDI flows (both inward and outward) act as proxies for the flow of such capital between two nations.

Having established a partial-equilibrium gravity model for FDI, one can reiterate the main empirical question for this study; are trade facilitating conditions, contained within PTA frameworks, associated with positive gains to bilateral FDI flows?

Rooted in the methodological discussion above, and in the setup seen in chapter's 1 and 2, this chapter employs the following gravity model specification in order to ensure a robust, theoretically grounded, and econometrically consistent model.

[4][86] $\mathrm{FDI}_{ij,t} = c + \beta_1 \ln GDP_{i,t} + \beta_2 \ln GDP_{j,t} + \beta_3 \tau_{ij,t} + \beta_5 \mathrm{TF\_Index}_{ij,t} + \beta_6 \mathrm{PTA}_{ij,t} + \beta_7 \mathrm{Depth}_{ij,t} + \left[FE_{ij,t}\right] + e_{ij,t}$

Where, $\mathrm{FDI}_{ij,t}$ represents the bilateral FDI between exporter *i* and importer *j* at time *t;* GDP is the proxy for national size; and $\tau_{ij,t}$ represents the standard proxies for trade cost determined in the literature. TF_Index represents the inclusion of one of the indexes for trade facilitation developed by Neufeld (2014). Fixed effects are represented by FE_{ij}, captures the use of fixed effects for importer at time *t*, exporter at time *t*, and a dyad fixed effect between importer and exporter. In addition, I control for the presence of a PTA utilising both a binary index to represent the presence of a PTA between trade partners, $\mathrm{PTA}_{ij,t}$, and the depth score utilised in chapter one developed by Dür et al. (2014), $\mathrm{Depth}_{ij,t}$. This model allows for one to test the following hypotheses:

- Shared membership in any PTA increases bilateral FDI due to the removal of absolute trade cost frictions.
- Deeper PTAs impact FDI more than PTAs with average depth due to the greater erosion of relative trade costs frictions.
- Trade facilitation conditions are positively associated with bilateral FDI flows due to the greater erosion of relative trade cost frictions.

3.4.2 Estimation of the Structural Gravity Model

As has been the similar case for chapter's one and two, the theoretical foundations of the FDI gravity model in this chapter, and subsequent model setup, are for the purpose of ensuring that the main policy variables (trade facilitating variables) can be estimated robustly and significantly. However, it is also the case that there may be non-observed or unknown factors, unaccounted for, that could result in biased estimations. In order to deal with these data-related and econometric challenged, there are several procedures that must be undertaken.

[86] See chapter 2, section 2.4.2, for a more detailed overview of the model.

Firstly, a primary concern is related to the econometric problems encountered by estimating the gravity equation in its additive form (i.e., log-log form). Santos Silva and Tenreyro (2006, 2010) argued that the conventional practice in the literature of log-linearising the GM and subsequent estimation in its additive form through OLS could not deal with the zero-valued bilateral FDI observations and heteroskedasticity in the data; and, thereby, led to misleading estimates. Accordingly, the recommendation is to estimate the GM in its multiplicative form.

Another concern involves the choice of the most suitable estimation method that allows the model to deal with the presence of zero-valued bilateral FDI observations. Zero values are frequent in FDI data and neglecting them might provide inconsistent estimates. Accordingly, and in line with recent literature, I employ a PPML estimator, as it can effectively derive significant estimates where there are zero bilateral FDI flows; in addition to controlling for the presence of heteroskedasticity in the FDI data (Santos Silva & Tenreyro, 2006).

Thirdly, I employ the best practice of using country-pair fixed effects in order to account for any unobservable time-invariant barriers to FDI. Incorporating country-pair fixed effects has been proven to be a better measure of the bilateral costs than the standard set of gravity variables[87] (Agnosteva et al., 2014; Egger & Nigai, 2015). Additionally, the use of country-pair fixed effects can address the endogeneity issue present as a result of the relation between trade facilitating protocols and FDI. The former is far more likely between partners who already have FDI (and trade) relations. Whilst there are several methods that can be employed to account for the endogeneity issue (see, e.g., Anderson et al., 2020; Egger et al., 2011), I follow the established practice of using country-pair fixed effects as they are able to deal with the endogeneity issue by accounting for the observable and unobservable linkages between the endogenous trade facilitation policy covariate and the error term (Yotov et al., 2016). In addition, I use origin-time and destination-time fixed effects to properly account for multilateral resistance terms in the panel gravity estimations[88] (Olivero and Yotov, 2012).

Fourth, in the setup of the data, I use panel data, which lead to improved estimation efficiency and, more importantly, allows the use of the country-pair fixed effects and the origin-time and destination-time fixed effects (Baldwin and Taglioni, 2006; Martínez-Zarzoso et al.,2009).

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[87] The standard set of gravity variables referring to GDP (a proxy for economic size), distance (a proxy for cost), and the established set of cost variables including contiguity, common language, a history of colonialisation, and common currency.

[88] The origin-time and destination-time fixed effects also absorb the country size variables (Y_{it} and Y_{jt}) from the structural gravity system in equations 1–3, in addition to all other observable and unobservable time-varying country-specific characteristics, including different national policies, institutions and exchange rates (Yotov et al., 2016).

Fifth, FDI flows (as with trade flows) do not respond immediately to policy changes. Accordingly, there has been some criticism of using panel data estimation over consecutive years (Trefler, 2004). Following the recommendation of Cheng and Wall (2005), the regressions are run, additionally, with three- and five-year FDI flow lags.

Finally, there is the potential for significant heterogeneity between PTAs (Horn, et al., 2010). As such, the utilisation of a simple dummy variable may fail to capture the true effects of PTAs on FDI flows. Deep PTAs usually include investment provisions and other provisions that might ease FDI inflows, in this might impact a different effect than in shallow PTAs. I utilise the depth variables developed by Dür et al. (2014).

3.5. Data, Testing, and Results

Similarly to Kox and Rojas-Romagosa (2020), I have deliberately refrained from modelling more FDI specificities that are considered to have an impact on FDI. For example, industry differences on FDI strategies, tax routing biases[89] (Damgaard et al., 2019), and firm-level interaction between investment and trade strategies (Conconi et al., 2016). These factors may cause additional variance in bilateral FDI patterns but are notoriously difficult to model. Primarily this is due to the increasing gap between the refinement of theoretical FDI models and the availability of FDI data. The underlying motivation of investments is rarely revealed and is generally only inferred through post-investment outcomes. Additionally, the industry decomposition of bilateral FDI is only available for a small number of countries or for limited applications. For example, The Financial Times *fDiMarkets* database provides industry level breakdown, but only for the reported amounts at announcement stage, and only for green-field investments. As such, country-wide and inter-country analysis is inhibited. Accordingly, for the interests of this chapter, the key focus of the econometric modelling is whether the main policy variable (trade facilitation conditions) remain significant despite the non-modelled, non-observed or even non-observable impacts on global bilateral FDI patterns.

3.5.1. Dataset Description

The dataset developed for this chapter is for the purpose of estimating the treatment effect of trade facilitation, as contained as conditions in PTAs, on bilateral FDI stocks between ASEAN nations and their investment partners. It consists of 104 countries, covering a period of 12 years (2001-2012), containing 23,640 bilateral partnerships. Bilateral partnerships are present for every ASEAN nation and their 103 investment partners, providing 1,030 country-pairs.

FDI Bilateral Data

In order to undertake gravity analysis, one needs bilateral data that is structured to provide information on the full sample population matrix (the bilateral relationship between countries). With respect to FDI, the availability of data is limited as most sources provide inflow and outflow data from one country to the rest of the world. Of the sources available, UNCTAD (2014) is recognised as having a suitable dataset for such work; the *Bilateral FDI Statistics database.* It provides systematic FDI data for over 200 countries and

[89] Tax routing refers to bilateral FDI that may be 'phantom FDI traffic' which is motivated by countries with low tax rates (tax havens), or by countries that facilitate special-purpose-enterprises (letter-box companies) that are frequently used in private or corporate tax evasion.

states and is broken down into four categories: (1) inflows, (2) outflows, (3) inward stocks ('instock'), and (4) outward FDI stocks ('outstock'). The data is compiled primarily from national sources of data where available. In the event data is withheld or unavailable, it is complemented with the mirror data (data from partner countries) and other international sources, such as the OECDs international direct investment statistics database. Data is available for the years 2001-2012 and all data is given in US$ millions.

Following the best practice of Anderson et al. (2019, 2020), inward bilateral FDI stocks are employed as the main dependent variable in the main specification. Primarily, this is because instock is more widely available and reliable than FDI flow data, and it aligns closely with the previously discussed knowledge capital stock theory. In addition, it is the category of data for which there is most observations. Of the ASEAN bilateral investment partnerships for which there is FDI data, zero-values represent 32% of total observations. This is in only marginally higher than the 31% of zero observations present in the entire global dataset[90].

Of note, there are around 2% of stock value observations in the UNCTAD dataset that are negative. This can be explained by examining the three core investment features included in the datasets stock and flow values: (1) greenfield direct dis/investments; (2) changes in intra-company loans, leases, and franchise fees between holding firms and their subsidiaries, and; (3) and changes in the valuation of foreign subsidiaries. The latter two of these features can result in the accounting notation of negative flows and stocks. Where negative values appear I have utilised either a four-year average or, where this is not available, set the value to zero[91]. FDI stock figures will be given in standard volume as the PPML estimator does not require the logged version. The resulting panel is strongly balanced. The bilateral trade and FDI cost variables are sourced from the CEPII gravity model dataset.

Policy Variables: Trade Facilitation and DESTA

The key measurement effect of interest to this chapter's analysis is the treatment effect of the trade facilitation conditions contained in PTAs on bilateral FDI. As such, it is necessary to employ a suitable classification of trade facilitation. Table 3.2 contains the overview of each trade facilitation index that will be incorporated into the testing. The indexes are from the work Neufeld (2014) and represent the conditions present in the WTOs Trade Facilitation Agreement (TFA), mapped against PTAs. In total, Neufeld codes

[90] See Kox and Rojas-Romagosa (2020).

[91] It is not practically or theoretically consistent to have negative FDI stock values. From the perspective of the gravity model, a negative FDI stock could only arise in the case that at least one of the economic masses (national GDPs) was negative.

TFA conditions against 275 agreements. Given the ASEAN focus of this chapter, conditions are mapped for a total of 42 agreements[92].

Table 3.2: Trade Facilitation Agreement Indexes[93]

Index Name	Contents and Overview
TFA Index[94]	The 'TFA Index' contains the TFA-related measures that are featured in the PTAs for which each bilateral pair is involved. There are 28 TFA-related measures in total. Each measure is representative of a condition featured in the WTOs TFA. This index is the aggregate of the subsequent three indexes.
GATT Article V index	GATT Article V regards the conditions for '*Freedom of Transit'*. This is captured in the index where PTAs condition for the *freedom of transit for goods*. The index is 1 where the condition is present, and 0 if it is not.
GATT Article VIII index[95]	GATT Article VIII regards the conditions relating to '*fees and formalities connected with importation and exportation'*. The index capturing this article is an additive index comprising of 19 conditions; covering aspects from the use of a single window system to post clearance audit procedures.
GATT Article X index[96]	GATT Article X regards the conditions covering procedures around '*transparency'*. The additive index capturing this article comprises 8 conditions that cover areas such as the internet publication of procedural materials, the establishment of enquiry points, and consultation obligations.

All dyadic partnerships in the dataset have resultantly been coded with the relevant trade facilitation classifications where there is a PTA between the nations. The adoption of, and compliance to, such PTA conditions provides harmonised, modernised, and streamlined preferential market access to the host market and is resultantly theorised to boost FDI. As such, the investment impact of trade facilitation conditions is made at the cross-section between preferential market liberalisation and regulatory compliance. In addition, the dataset incorporates the PTA depth classifications developed by Dür et al. (2014) from their Design of Trade Agreements (DESTA) dataset, which is by far the most comprehensive collection of PTAs available

[92] The list of agreements can be found in Appendix C1.

[93] Adapted from the work of Neufeld (2014). The full index conditional contents can be found in appendix 2.

[94] A comprehensive overview of the index can be found in the work of Neufeld (2014).

[95] The full list can be found in Appendix C2.

[96] The full list can be found in Appendix C2.

(Berger et al, 2018). Accordingly, each bilateral partnership coded for a PTA is also coded for depth. Pioneered to be the most sophisticated operationalisation of the concept of depth agreements depth is coded across 10 broad sectors of cooperation: market access, services, investments, IPR, competition, public procurement, standards, trade remedies, non-trade issues, and dispute settlement. Using these provisions, DESTA generates a PTA depth index that ranges from one to seven, depending on how many provisions are present in each trade agreement. The remainder of the dataset utilises CEPIIs gravity model database to provide standard bilateral gravity variables including GDP, distance, contiguity, common language, and previous colonial ties.

3.5.2. Main Regression Equation

In line with the current literature best practice, the structural model of equations 1-3 is applied to a data panel using the following econometric specification for the baseline regression:

$$[4] \qquad FDI_{ijt} = exp\left[\gamma_1 TF_{ijt} + \gamma_2 PTA_{ij} + \gamma_3 D_{ij} + \mu_{it} + \mu_{jt} + \mu_{ij}\right] + \varepsilon_{ijt}$$

Where:

- FDI_{ijt} is inward FDI from origin country *i* to host country *j* in time period *t*.
- TF_{ijt} is a time-variant vector of trade facilitation conditions. There are two TF vectors being regressed in this chapter. Firstly, TF-Index; a variable representing the summed trade facilitation conditions present in a given PTA. Secondly, TF-Dummy; a binary dummy that take the value of zero where there are no trade facilitation conditions, and one where there are one or more trade facilitation condition is present.
- PTA_{ij} is a time-variant control variable accounting for the presence of a PTA.
- $\gamma_3 D_{ij}$is a time-variant control variable accounting for the depth of a given PTA.
- μ_{it} is a time varying origin-country fixed effects (dummy variable) that controls for the outward multilateral resistance terms and the countries' output share.
- μ_{jt} represents time-varying destination-country fixed effects that account for the inward multilateral resistance terms and total expenditure.
- μ_{ij} is the set of country-pair is the set of country-pair fixed effects that absorb all time-invariant gravity covariates from z_{ij} along with any other-time invariant determinants of FDI frictions that are not observable.
- ε_{ijt} is the combined error term.

This chapter is testing a partial equilibrium model where FDI flows change only where a change is made in the bilateral trade facilitation policy variables. The time-varying multilateral resistance terms in the gravity model account for the change in each partner's relative opportunity cost for FDI. The focus here is specifically on the direct effects of trade facilitation policy variables on FDI. The estimations are made using a Poisson Pseudo-Maximum Likelihood (PPML) estimator as was the case in chapter's 1 and 2.

3.5.3. Empirical Testing and Results

Where trade agreements and FDI are concerned, the literature points to the positive economic prospects of increased investment resulting from the ratification of a trade agreement (Medvedev, 2012). It is, in part, the result of the interrelation between trade and investment set within an improving regulatory environment, noting that the positive association between trade and PTAs is well established (Cipollina and Salvatici, 2010; Dür et al., 2014). Overarchingly, however, it is the associated positive effects of preferential liberalisation. As discussed, preferential liberalisation may affect FDI through four distinct groups: trade liberalisation, non-trade provisions, market extension, and growth effects. Summarily, there is an observed complementarity between trade and investment as a result of the growing importance of MNE production networks and intra-industry and intra-firm trade (Caves, 1996; Markusen, 2002; Globerman and Shapiro, 2002). As identified by Chakrabarti (2001), after market size, openness to trade has been the most reliable indicator of the attractiveness of a location for FDI. One would therefore expect to see positive returns to investment from a greater degree of trade facilitation conditionality in a given PTA. Additionally, and from the perspective of non-trade liberalisation, the effects of deeper integration provisions in PTAs[97], such as trade facilitation coverage, are found to be an important driver of FDI, whereby they can lower political risk by locking-in reforms and improving the investment climate Kolstad and Tondel (2002). As motivated by these insights, and for the purpose of identifying the ASEAN context, prior to running the regressions with trade facilitation classifications by GATT index breakdown, it is important to identify the average impact PTAs have on foreign direct investment. It is useful as a starting point to estimate the average effect of ASEAN, or ASEAN nation, associated PTAs on the level of bilateral FDI between nations. It provides a novel insight on the historical circumstance of investment within the 2000 to 2012 period and provides the additional benefit of setting the estimate within the greater body of PTA-FDI literature. Accordingly, a regression incorporating a full set of fixed effects is run to estimate the impact of the average PTA in the dataset (regression (1) in Table 3.3).

[97] Identified in the work of Adams et al. (2003) as condition covering: investment, liberalisation of trade in services, setting and harmonisation of standards, competition policy, customs cooperation, dispute settlement, and IPR protection. They can also be considered to be trade facilitation conditions.

Table 3.3: Regression Results. PTAs, Depth, and Trade Facilitation

Variables	(1) FDI_t	(2) FDI_t	(3) FDI_t	(4) FDI_t	(5) FDI_t	(6) FDI_t	(7) FDI_t	(8) FDI_t	(9) FDI_t
PTA	0.603***	0.193	0.311	0.303	0.002	0.214	0.193	0.015	0.228
	(0.004)	(0.286)	(0.295)	(0.355)	(0.993)	(0.423)	(0.505)	(0.963)	(0.325)
Depth (index)			0.034	0.053	0.153		0.018	0.067*	0.06
			(0.548)	(0.163)	(0.168)		(0.775)	(0.092)	(0.107)
TF_t (Index)		0.051***	0.062**						
		(0.001)	(0.019)						
TF_{t-3} (Index)				0.048***					
				(0.000)					
TF_{t+3} (Index)					0.006				
					(0.683)				
TF_t (Dummy)						0.469**	0.367**		
						(0.042)	(0.036)		
TF_{t-3} (Dummy)								0.610***	
								(0.000)	
TF_{t+3} (Dummy)									-0.142
									(0.55)
Pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,302	7,302	7,302	7,302	7,302	7,302	7,302	7,302	7,302
R_Squared	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at the 5% level; (***) significant at 1% level.

As can be seen from the results, at an aggregate level, the presence of a PTA between signatory country partners is associated with an increase in bilateral FDI, where the coefficient is a statistically significant and positive 0.603. Converted into percentage terms this is an increase of 83% on average. This is in line with the literature on the topic. The work of Yeyati et al. (2003) finds that joining a PTA increases bilateral FDI between members by 27%, whilst the earlier work of Lim et al. (2001) identified that FDI to GDP rates increased significantly for nations joining large preferential trading blocs; 50% in the case of Portugal and Spain (on their EU accession), Brazil (on joining MERCOSUR), and Mexico (signing off on NAFTA). This increased to 70% in the case of Argentina joining MERCOSUR[98]. Notably, however, the results estimated in this chapter point to a greater degree of bilateral FDI increase, resulting from the adoption of a PTA, in the case of the ASEAN nations. This can be partially explained through the lens of the region's designation as a strategically important centre for investment and development. This can be explained through the presence of several investment motivating regional features (Ambashi, 2017).

Firstly, ASEAN nations offer a comparatively low wage to that of alternative market destinations such as China. This is enhanced by the fact that, under AFTA, ASEAN presents the world's fifth largest economy. In addition, the growth in development of the CLMV nations (Cambodia, Lao, Myanmar, and Vietnam) helps to secure the regions medium term growth potential. Theoretically, these features align with the FDI motivations of market scale opportunity and the positive relationship between market liberalisation and investment.

As the primary focus of this chapter is to identify the effects of trade facilitation upon bilateral FDI in the context of its inclusion in a PTA, I then run a regression incorporating a dummy measure of PTA participation and a measure of trade facilitation. The first measure is an indexed classification capturing the 28-condition classification across articles V, VIII, and X. The second measure of trade facilitation is a dummy variable for the presence of any conditionalities in the PTA captured by the Neufeld (2014) classification. As noted, the TFA index is an additive index incorporating 28 conditions contained in PTAs that map directly to conditions in the multilateral TFA. In practice for this dataset, the range of the index is between 0 and 20. Of the 1,894 indexes with a value greater than 0, the average PTA contains 14 TFA conditions.

As can be seen in column five, on the introduction of trade facilitation conditions as a dummy variable, the associated increase to bilateral FDI from the presence of a PTA is reduced to 24 percent. The effect where

[98] Similar positive associations can be found in the works of Adams et al. (2003) DeRosa (2008), Gao (2009) Blonigen and Piger (2014), and Mishra and Jena (2019).

the trade facilitation dummy is equal to one, however, is estimated to facilitate an increase in bilateral FDI of 60 percent. This finding is reasonably expected when set within the existing empirical literature on the effect of preferential liberalisation on FDI[99]. As a stand-alone binary variable PTAs are a representation of their total conditions set. When a particular condition set is extracted and estimated in tandem (as is the case here with trade facilitation), the effect of the PTA can be expected to reduce. It is important to note that in cases where a bilateral partnership has a PTA and conditions governing trade facilitation, investment is expected to be greater than where the PTA absent the conditions. Where the trade facilitation conditions are estimated as an index, each additional condition is also positive and statistically significant[100].

Following the estimation with a focus on PTA effects it is time to measure the effect of the aggregate trade facilitation agreement index on bilateral FDI, with the addition of depth classifications. As is emerging as the literature standard, each regression of the index is controlled for using an indexed variable for depth. As noted by Kox and Rojas-Romagosa (2019), there is a high degree of positive correlation between variables denoting the presence of a PTA and the variables capturing depth. This is the result of depth measurements only existing in the presence of the PTA they represent. Accordingly, the trade facilitation index, and subsequent trade facilitation feature indexes, are regressed alongside depth as they can capture the heterogeneity of PTAs.

In addition, having measured for the effect in time *t,* a subsequent regression captures the effect following a three-year policy lag to account for the required rules and regulations to take effect (Cheng and Wall, 2005). Finally, a three-year time lag is introduced to account for the reality that policy changes are rarely instantaneous and need time to imbed within an economy. In addition, and in order to address the issue of reverse causality, each index will be tested with a three-year time lead. Regressions 3-5 utilise the Trade Facilitation Index variable (TF-Index) and regressions 7-9 employ the Trade Facilitation Dummy variable (TF-Dummy). The purpose of estimating both indexed and dummy measures of trade facilitation is twofold.

Firstly, the incorporation of the indexed measures is in line with the previous literature; for example, Duval et al. (2016) incorporating the Neufeld (2014) classification into the study of how they affect subsequent trade costs. Secondly, the dummy provides measure of the total effect of the presence of trade facilitation conditions in PTAs such that one can identify the total effect of its aggregate presence. By comparison, the indexed measure provides an iterative estimation that allows us to return to FDI of one more trade facilitation condition, from the total packet of conditions. As the literature has outlined in expectation, when

[99] In this application the form of preferential liberalisation is set specifically within PTAs and trade facilitation conditions.

[100] Each additional condition is estimated to increase bilateral FDI by 5.2%.

the trade facilitation dummy is regressed in time *t* (column 6) there is an estimated increase in bilateral FDI of 44.3% in the presence of trade facilitation conditions[101]. This increases to 83% after three years. As is consistent with the literature on depth and trade, depth is also associated with a positive return to FDI, as is the presence of a PTA. These findings align theoretically with the literature around preferential trade liberalisation and new regionalism. At the aggregate level, the incorporation of trade facilitation conditions is intended for the purpose of simplifying, modernising, and harmonising the export and import process, contained within a cooperative mechanism.

Specifically, the conditions measured here seek to facilitate an environment for greater trade and investment by enhancing performance in signatory transparency, transit, and formalities. This is achieved through a concert of increased confidence and reduced cost, owed to a reduction of corruption (achieved through the use of IT, risk management practices, and bureaucratic structure) and a reduction in processing time (owed to a standardisation and predictability of at- and behind-the-border procedures. Accordingly, investment and trade conditions are enhanced. As noted in the work of Adams et al. (2003), PTA provisions related to non-trade aspects (such as services or investment) can directly stimulate FDI. Additionally, the signing of a PTA can offer signatory's access to a larger host market into which they will be motivated to invest (Kolstad and Tondel, 2002). Explored through the lens of Dunning's four FDI motivations one can see how PTAs provide investment opportunity that previously could have been deemed too costly or uncertain. It is an additional and crucial aspect of the PTA-architecture that underpins global trade relations.

The remainder of this section goes on to examine the treatment effect of TFA features broken into three separate indexes[102]: (1) the GATT Article V index; (2) the GATT Article VIII index; and (3) the GATT Article X index. Having measured the average effect of trade facilitation conditions on bilateral FDI flows, it is useful to examine whether the positive association is driven by a particular feature of trade facilitation: transparency, formalities, or transit procedures. Each provides a different lens through which to examine the interplay of PTAs, FDI, and trade facilitation.

Table 3.4 contains the results for the regression on GATTs article X, covering transparency conditions. In total there are 1,880 non-zero observations, with the average agreement containing five transparency conditions.

[101] In regard to the indexed capture of trade facilitation conditions, the positive effect is estimated to be 6.4% at time t and 5% at time t-3.

[102] Table 1 contains the comprehensive overview of each index.

Table 3.4: Regression Results. Article X. Transparency.

Variables	FDI_t	FDI_t	FDI_t	FDI_t	FDI_t	FDI_t
Article X_t (Index)	0.106***					
	(0.030)					
Article X_{t-3} (Index)		0.090***				
		(0.005)				
Article X_{t+3} (Index)			0.036			
			(0.281)			
Article X_t (Dummy)				0.425*		
				(0.070)		
Article X_{t-3} (Dummy)					0.667***	
					(0.000)	
Article X_{t+3} (Dummy)						-0.167
						(0.473)
PTA	0.412	0.135	0.335	0.222	0.047	0.217
	(0.199)	(0.663)	(0.301)	(0.447)	(0.881)	(0.505)
Depth (index)	0.01	0.046	0.056	0.018	0.065	0.06
	(0.835)	(0.274)	(0.152)	(0.692)	(0.104)	(0.104)
Pair FE	Yes	Yes	Yes	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,302	7,302	7,302	7,302	7,302	7,302
R_Squared	0.92	0.92	0.92	0.92	0.92	0.92

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at the 5% level; (***) significant at 1% level.

The effect on bilateral FDI in time *t* is associated with a positive return to article ten conditions; the presence of the trade facilitation transparency dummy is estimated to be statistically significant and positive at 0.106. In percentage terms this outlines an average return to bilateral FDI of 53%[103]. Following the introduction of the three-year time-lag (and the allowance for policy changes to take effect), the effect is estimated to have increased to 0.667. This represents an effect almost double that in time *t*. This is the largest estimated return of the three indexes and may represent the fact that the market effect is greater in determining the

[103] As an indexed measure, the increase is estimated at 11% in time t and 9.5% in time t-3.

initial investment cycle, whilst strategic decisions for medium term investment are considered following the certainty of implementation.

Transparency mechanisms relate to the rules and regulation governing FDI between signatories with relation to the publication and availability of information, advance rulings, and appeals. They are the, in time *t*, the conditions that allow business to prepare for investment decisions with certainty as to process and procedure. They are also the least time-adjustment bound as they can be released instantaneously upon ratification of the agreement and its coming into practice. The index is additionally, at least in part, proxying for the reduction of information asymmetry. Where asymmetry is reduced, confidence in decision making is higher. Resultantly, each additional improvement in the information landscape can be motivating a greater degree of investment. As is the case for each classification of TF-index, the introduction of a time lead is statistically non-significant as is to be expected.

Table 3.5 contains the results for the regression containing the GATT article eight index. The largest of the indexes, Article VII regards the fees and processes of FDI arrangements. This includes consularisation, the use of international standards, the implementation of a single window system, and risk management protocols, amongst others. These features take time to implement within the scope a PTA, but work alongside article X transparency conditions to provide a full investment picture for businesses abroad to base their decisions upon. Broadly, this index captures the direct and indirect cost impositions faced by traders and investors in a host market. In practice, this index has a range from 0 to 13, with the average PTA containing 10 article eight conditions.

As we can see from the table, the GATT Article VIII dummy variable is associated with a statistically significant and positive increase to bilateral FDI. Similarly, to conditions around transparency, the magnitude of the effect increases when the policy adaption time frame is introduced[104].

The positive association here is in line with expectations. The imposition of cost (be it direct or indirect) is a direct disincentive to investment. Where costs and formal procedures are streamlined and harmonised the reduction in cost is also met with a greater degree of confidence, and opportunity for investment in a new (or at least easier met) market. This would be expected to bring about an increased flow of investment. For example, a single window system is expected to facilitate trade and investment by enabling the submission of all regulatory documents to a single point of entry, that fulfils the full range of transit, export, and import

[104] t the index level, the return is estimated to be 12% at time t, and 10% at time t-3.

related requirements. This ensures a reduction in information asymmetry, promotes confidence, and eases the burden of time and cost for mapping previously disparate regulatory requirements.

Table 3.5: Regression Results. Article VIII. Fees and Formalities for Export and Import

Variables	FDI_t	FDI_t	FDI_t	FDI_t	FDI_t	FDI_t
Article $VIII_t$ (Index)	0.116**					
	(0.020)					
Article $VIII_{t-3}$ (Index)		0.095***				
		(0.000)				
Article $VIII_{t+3}$ (Index)			0.0003			
			(0.990)			
Article $VIII_t$ (Dummy)				0.388		
				(0.311)		
Article $VIII_{t-3}$ (Dummy)					0.622***	
					(0.000)	
Article $VIII_{t+3}$ (Dummy)						-0.062
						(0.795)
PTA	0.175	0.085	0.276	0.189	0.200	0.254
	(0.526)	(0.786)	(0.402)	(0.513)	(0.950)	(0.439)
Depth (index)	0.030	0.059	0.054	0.015	0.067*	0.057
	(0.593)	(0.144)	(0.154)	(0.802)	(0.091)	(0.130)
Pair FE	Yes	Yes	Yes	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,302	7,302	7,302	7,302	7,302	7,302
R_Squared	0.92	0.92	0.92	0.92	0.92	0.92

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at the 5% level; (***) significant at 1% level.

The final index to examine in the breakdown of the TFA mapping reflects GATT article five on freedom of transit (Table 3.6). Primarily this regards the ability for parties to freely make transit through the territory of each host nation via the route most suitable for international transit (WTO, 2020). In absence of such a condition there is large degree of inability to conduct trade in a timely and efficient manner, resulting in large indirect costs. Unlike the previous two indexes, the GATT article 5 index is binary.

Table 3.6: Regression Results. Gatt Art. V Index. Freedom of Transit.

Variables	FDI_t	FDI_t	FDI_t
Article V (Dummy) t	0.001**		
	(0.996)		
Article V (Dummy) t-3		0.214	
		0.242	
Article V (Dummy) t+3			-0.017
			(0.949)
PTA	0.275	0.220	0.271
	(0.390)	(0.505)	(0.396)
Depth (index)	0.055	0.058	0.055
	(0.300)	(0.133)	(0.133)
Pair FE	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes
Observations	7,302	7,302	7,302
R_Squared	0.92	0.92	0.92

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at the 5% level; (***) significant at 1% level.

As noted, freedom of transit incorporates the principles that goods will travel on the most convenient route, with no discrimination, no unnecessary delays or restrictions, and no duties. It is the least positive association of the three indexes in time t at 0.001. This makes sense in the context that investment decision are partially rooted in the ability to export goods with ease, but there is little opportunity to affect that change immediately. After three-years this increases to 0.214. Whilst the larger difference in magnitude may initially seem unusual, it can be explained in line with theory. In the case of the indexes capturing transparency and formalities effects, the day of ratification can usher in instantaneous policy changes for some of the variables. For example, in the case of transparency, country *i* can immediately ensure publication and availability of information for businesses in country *j*. Where fees and formalities are concerned, the same can be true for penalty disciplines or release times. By comparison, freedom of transit may require a greater degree of cost and time to harmonise, simply and modernise; especially where exchange and transit infrastructure has not previously existed. One may have access to all necessary information and be freed by a reduction in cost, but still face difficulties in the shipping or cargo routes. As a stand-alone estimation, the magnitude and directional effect of greater transit harmony is expected due to the market facilitation effect it provides.

3.6. Conclusion

The past twenty-five years has seen a significant increase in the number of preferential trade agreements. Increasingly these agreements are provisioning for a greater degree of conditionality that enhances preferential liberalisation around trade and investment. Concomitantly, the proliferation of multinational enterprises under the globalisation of business and trade has seen FDI surge globally to increasingly webbed in a pattern of PTAs.

Accordingly, of particular interest is the interplay between PTAs and FDI around the concept of trade facilitation. The simplification, modernisation, and harmonisation of export and import processes (WTO, 2019) is expected to enhance trade efficiency and connectivity, through the means of reducing uncertainty, promoting symmetry of information, and minimising the cost of regulatory compliance.

The co-operation outcomes facilitated through the ratification of a PTA can work to support structural economic reform, aid economic transformation, and ultimately attract and enhance foreign investment. In the absence of total multilateral consensus, the preferential arrangements of trade provide a suitable platform for enhanced border cooperation to play out in the channels of FDI. The fact that Increasingly, trade is taking place within an integrated supply network between multiple nations (WTO, 2021) bears witness to the positive economic prospects associated with an increase to a nation's FDI portfolio (both inward and outward).

However, despite our collective understanding on the interplay between trade, FDI, and PTAs, there remains comparatively little work on the effect of trade facilitation conditions on FDI set within a PTA framework. What we do know comes primarily from the works of Neufeld (2014) and Duval et al. (2016). From this we know that trade facilitation conditions have resulted in the significant reduction of trade costs, and resultantly a greater return to trade and investment.

Accordingly, this chapter is the first to measure the treatment effect of trade facilitation conditions in PTAs within the context of a regional grouping: in this case ASEAN.

The results of this chapter highlight that trade facilitation conditions contained within PTAs have been deterministic in the positive bilateral FDI flows between signatories of ASEAN agreements.

This aligns itself with the theoretical branch of FDI-PTA literature that has identified how the ratification of a trade agreement results in increased and positive economic prospect between partners (Medvedev,

2012) resulting from the interrelation between trade and investment as set within an improving regulatory environment: noting that the positive association between trade and PTAs is well established (Cipollina and Salvatici, 2010; Dür et al., 2014) and building on the complimentary relationship between trade and FDI (Brainard, 1997; Helpman et al, 2004; and, Camarero et al., 2019).

At the aggregate level as estimated by a dummy variable for the presence of trade facilitation conditions (mapped against the World Bank's Trade Facilitation Agreement by Neufeld (2014)), the incorporation of trade facilitation measures is associated with a statistically significant return to bilateral FDI, in the ASEAN context, of 84% after three-years of agreement ratification and incorporation. The same positive effects are estimated for the three articles of incorporation covering trade facilitation in the agreements: article X on transparency, article VIII on fees and formalities, and article V on freedom of transit.

The results align with the expectation that an enhanced trade facilitation landscape (one in which such formalities, procedures, information, and expectations around trade facilitation are conditioned for) are expected to incentivise and attract FDI. In the literature that examines the institutional quality and FDI relationship, it is commonly accepted that low institutional quality will negatively affect the investment choices by creating a risk factor, in addition to burdensome costs of procedural compliance. By comparison, business decision making in the context of investment versus export decision making is vastly improved by access to timely and correct information and enhanced by streamlined, harmonised, and enhanced trade mechanisms and practices. In addition to the new-market opportunities that a trade agreement brings about, the trade facilitation conditions contained therein offer an investment road map for companies to base their decisions.

Of course, in light of the many factors that can explain the relationship between FDI and trade facilitation under PTAs, it is important to note that it is difficult to pin down a precise effect at the aggregate level. Subsequent study in this space would benefit from an understanding of the growing literature on trade and multinational activity at the firm level[105]. The firm-level modelling allows researchers to further specify specific change-driving effects.

[105] See, for example, Head and Mayer (2019) on multinational decision-making in the car industry or Baccini et al. (2017) on the distributional consequences of PTAs at the firm level.

Conclusion

In the realm of economic theory, it is clear that preferential trade agreements are not all even in purpose, design, implementation, or effect. The myriad factors that underpin the arenas of national development, international relations, and global economic structure necessarily generate contextually bound interactions from which change may occur. In the context of international trade and investment we can see this as the factors most commonly associated with the establishment of a beneficial relationship: shared borders, common language, geographical distance, and *trade agreements* (to name but only a few).

Knowing this to be the case, it is therefore important to develop fit-for-purpose modelling parameters that can support researchers collective understanding as to the factors that support the economic system in which we reside. For the purpose of this Thesis, the Gravity Model has served as the gold standard methodological underpinning from which to explore the importance of PTA design characteristics.

As noted in the introduction, economic growth is driven by international trade, and PTAs supply a fit-for-purpose mechanism of choice for establishing, facilitating, and governing its flows. Where the specifics of content and conditionality have been nascent, the growing works in this arena have provided an opportunity to further the knowledge on the trade and investment relationships in the context of trade agreements. Where this work has begun, notably around depth, it has allowed for regional specific understanding to be born.

Accordingly, this thesis provides a useful extension of its forbears and supports the motivating assertion that PTA conditionality composition has a significant economic effect (in terms of trade or FDI) on the bilateral relationships that it governs.

Appendices

Appendix A. Chapter 1

Appendix A1. DESTA Depth_Rasch Variables.

Table A1.1: Service Variables

Service Chapter	Does the agreement contain a reference to the liberalization of trade in services?
GATS Reference	Does the agreement contain a reference to the General Agreement on Trade in Services (GATS)?
MFN Treatment	Does the agreement contain an MFN clause for services?
Negative List Approach	Does the agreement foresee a negative list approach to services liberalization?
Services National Treatment	Does the agreement contain a national treatment clause for services?
Services Non-Establishment	Does the agreement grant the right of non-establishment for service provision (that is, does it allow the provision of services without local presence)?
Movement of Natural Persons	Does the agreement allow the movement of natural persons in the provision of services?
Service Continuous	Does the agreement contain a review provision for the ser- vices provisions?

Table A1.2: Investment Variables

Investment Chapter	Does the agreement contain substantive investment provisions?
Standards of Treatment	Does the agreement contain provisions that grant compensation to investors in case of strife and/or expropriation?
TRIM reference	Does the agreement contain a reference to the WTO agreement on trade-related investment measures?
Pre-Establishment Operation	Does the agreement contain non-discrimination provisions in relation to pre-establishment operations?
Establishment	Does the agreement contain non-discrimination provisions in relation to establishment (e.g., greenfield investments)?

Post-Establishment Operation	Does the agreement contain non-discrimination provisions in relation to post-establishment operation (e.g., the free movement of capital and resale)?
Mergers	Does the agreement contain non-discrimination provisions in relation to mergers and acquisitions?
Investments MFN	Does the agreement grant MFN treatment on investments?
Investments National Treatment	Does the agreement grant national treatment on investments?
Transfers and Payments	Does the agreement mention specific restrictions regarding transfers and payments?
Movement of Natural Persons (Investments)	Does the agreement mention restrictions related to the temporary movement of business or natural persons?

Table A1.3: Intellectual Property Right Variables

IPR General	Does the agreement contain a provision on intellectual property rights (IPRs)?
IPR MFN	Does the agreement contain an MFN provision for IPRs?
Rome Convention	Does the agreement include obligations for acceding to the Rome Convention?
Paris Convention	Does the agreement contain obligations for acceding to the Paris Convention?
Bern Convention	Does the treaty contain obligations for acceding to the Bern Convention?
TRIPS	Does the agreement mention the TRIPS Agreement?
WIPO Copyright Treaty	Does the agreement contain obligations for acceding to the World Intellectual Property Organization (WIPO) Copyright Treaty?
WIP Phonograms Treaty	Does the agreement contain obligations for acceding to the WIPO Phonograms treaty?
IPR Substantive Standards	Does the agreement contain specific provisions in relation to substantive standards of protection?
Pharmaceuticals in IPRs	Does the agreement contain references to pharmaceuticals?
Geographical Indications	Does the agreement contain references to geographical indications?

Table A1.4: Public Procurement Variables

Procurement Chapter	Does the agreement contain substantive provisions on public procurement?
Procurement National Treatment	Does the agreement guarantee national treatment with respect to public procurement?
Procurement Transparency	Does the chapter on public procurement include a transparency provision?
Procurement WTO	Does the agreement contain a reference to the WTO/GATT procurement agreements?

Table A1.5: Standards Variables

TBT WTO	Does the agreement contain a reference to the WTO Agreement on technical barriers to trade (TBTs) (the GATT standards code)?
TBT Cooperation	Does the agreement call for cooperation and/or information exchange on TBTs?
Non-distorting Standards	Does the agreement contain a requirement for standards to be least trade-distorting?
International Standards	Does the agreement encourage the use of international standards?
SPS Cooperation	Does the agreement contain provisions calling for information exchange and technical cooperation on sanitary and phytosanitary (SPS) measures?
SPS WTO	Does the agreement contain a reference to the WTO SPS agreement?
TBT Harmonization	Does the agreement contain provisions that stipulate the harmonization of standards?
SPS Harmonization	Does the agreement contain provisions that stipulate the harmonization of SPS provisions?

Table A1.6: Competition Variables

Competition Chapter	Does the agreement contain a competition chapter?
National Competition Authority	Does the agreement contain a provision stipulating the establishment of a national competition authority?

Competition Coordination	Does the agreement contain a provision stipulating coordination among national authorities?
Common Competition Authority	Does the agreement contain a provision stipulating the creation of a common authority/institution on competition?
Monopoly	Does the agreement contain a provision on monopolies and cartels?
Acquisitions	Does the agreement contain a provision on mergers and acquisitions?

Appendix A2. 'Latent Trait Analysis' Discussion.

Latent Trait Analysis (LTA) is a form of latent structure analysis (Lazarsfeld and Henry, 1968), and is used for the analysis of categorical data. It is best thought of as a form of factor analysis for binary or ordered-category data. In the area of educational testing and psychological measurement, LTA is termed Item Response Theory (IRT).

It is used to reduce a set of many binary variables to a small set of factors, called latent traits. This can be done for the purposes of data reduction, data exploration or theory confirmation.

The power of LTA models is derived from the fact that they are formalised probability models: they include a 'theory' that relates the unobserved (latent) construct(s) of interest to the observed (manifest) variables that are actually measured. Such models let one determine the association of each item with the construct being measured.

Two variations exist. There is the Gaussian ('normal ogive') model, which derives from the assumption of normally-distributed measurement error. The second (which is utilised by the DESTA team) is the Rasch model. This model derives from somewhat different theoretical assumptions.

Rasch analysis (RA) is a unique approach of mathematical modelling based upon a latent trait and accomplishes stochastic conjoint additivity. The purpose of such a method is to maximise the homogeneity of the trait and allow greater reduction of redundancy at no sacrifice of measurement information, by decreasing items and/or scoring levels to yield more valid and simple measures.

RA permits rating of a limited set of attributes that are representative of the underlying trait. The summed rating of the attributes represents how much of the trait has been mastered, since the raw score is the 'sufficient statistic' for the Rasch measure. Measurement represents the mapping of a group of predefined objects and their empirically observable relationship with a set of numbers;

$$\varepsilon = \{A, r_1, \dots, r_m\}$$

Such that A is a set of objects (such as PTA conditions) and r_j is a relationship between them concerning a certain attribute (depth). These are mapped on to a numerical relations system;

$$\mathbb{N} = \{\mathbb{R}, r_1', \dots, r_m'\}$$

Where $r_j \Leftrightarrow r_j'$ for all defined j.

As acknowledged by DESTA, utilising LTA allowed the team to deal with highly correlated data and to account for the fact that not all items are of equal importance in establishing the extent of countries commitments.

Owed to the Rasch-assumption that all items are related to a single underlying dimension (trait), all 48 variables utilised are theoretically related to the depth of an agreement. They pertain to aspects of services liberalisation, trade-related investment measures, intellectual property rights and standards.

Further and considered exploration of the process can be found in Bartholomew et al. (2011) and Bond and Fox (2007).

Appendix A3. Dataset Features

Table A3.1: List of Preferential Trade Agreements and Details

PTA Name	Entry Force Year	Members of the Agreement	Flex_ Rigid	Flex_ Escape	Depth_ Index	Depth_ Rasch
Protocol on Trade Negotiations (PTN)	1973	Brazil; Chile; Egypt; Greece; India; Israel; Mexico; Peru; Republic of Korea; Pakistan; Philippines; Spain; Tunisia; Turkey; Uruguay; Serbia.	0	2	0	-1.428
Asia Pacific Trade Agreement (APTA)	1976	India; Bangladesh; Republic of Korea; Lao PDR; Sri Lanka.	0	4	1	-1.428
Association of Southeast Asian Nations (ASEAN) Preferential Trading Arrangements (PTA)	1977	Indonesia; Malaysia; Philippines; Singapore; Thailand.	0	1	1	-1.007
Global System of Trade Preferences (GSTP)	1989	Algeria; Argentina; Bangladesh; Benin; Bolivia; Brazil; Cameroon; Chile; Colombia; Cuba; Ecuador; Egypt; Ghana; Guinea; Guyana; India; Indonesia; Iran; Iraq; Democratic People's Republic of Korea; Korea, Republic of; Libya; Malaysia; Mexico;	0	4	0	-1.428

		Morocco; Mozambique; Myanmar; Nicaragua; Nigeria; Pakistan; Peru; Philippines; Singapore; Sri Lanka; Sudan; Tanzania; Thailand; Trinidad and Tobago; Tunisia; Venezuela, Bolivarian Republic of; Viet Nam; Zimbabwe				
Laos Thailand	1991	Lao PDR; Thailand.	0	0	0	-1.428
Association of Southeast Asian Nations (ASEAN) FTA	1992	Brunei Darussalam; Indonesia; Malaysia; Philippines; Singapore; Thailand.	1	1	2	-1.007
Association of Southeast Asian Nations (ASEAN) FTA Vietnam accession	1995	Brunei Darussalam; Indonesia; Malaysia; Philippines; Singapore; Thailand; Vietnam.	1	1	2	-1.007
Association of Southeast Asian Nations (ASEAN) FTA Laos and Myanmar accession	1997	Brunei Darussalam; Indonesia; Lao PDR; Malaysia; Myanmar; Philippines; Singapore; Thailand; Vietnam.	1	1	2	-1.007
Association of Southeast Asian Nations (ASEAN) FTA Cambodia accession	1999	Brunei Darussalam; Cambodia; Indonesia; Lao PDR; Malaysia; Myanmar; Philippines; Singapore; Thailand; Vietnam.	1	1	2	-1.007
New Zealand Singapore	2001	New Zealand; Singapore.	4	4	5	1.374

United States Vietnam	2001	United States of America; Vietnam.	0	3	4	1.529
Bangkok Agreement China accession	2002	China; India; Bangladesh; Republic of Korea; Lao PDR; Sri Lanka.	0	4	1	-1.428
EFTA Singapore	2003	Liechtenstein; Iceland; Norway; Switzerland; Singapore.	5	3	5	1.476
Japan Singapore	2002	Japan; Singapore.	6	4	6	1.223
Australia Singapore	2003	Australia; Singapore.	3	4	7	1.693
Jordan Singapore	2005	Jordan; Singapore.	7	4	4	1.071
Association of Southeast Asian Nations China	2005	Brunei Darussalam; Cambodia; China; Indonesia; Lao PDR; Malaysia; Myanmar; Philippines; Singapore; Thailand; Vietnam.	4	3	2	-0.109
Australia Thailand	2005	Australia; Thailand.	3	4	5	1.425
India Singapore	2005	India; Singapore.	5	4	4	1.172
Japan Malaysia	2006	Japan; Malaysia.	5	4	6	1.582
Korea Singapore	2006	Republic of Korea; Singapore.	5	4	7	1.751
Asia Pacific Trade Agreement (Bangkok Agreement amended)	2006	China; India; Bangladesh; Republic of Korea; Lao PDR; Sri Lanka.	2	4	1	0.187
New Zealand Thailand	2005	New Zealand; Thailand.	6	3	5	1.172

Trans Pacific Strategic EPA	2006	Brunei Darussalam; Chile; New Zealand; Singapore.	3	3	6	1.425
Peru Thailand	2005	Peru; Thailand.	3	3	1	-0.370
D8 PTA	2006	Bangladesh; Egypt; Indonesia; Iran; Malaysia; Nigeria; Pakistan; Turkey.	0	4	1	-0.534
Japan Philippines	2008	Japan; Philippines.	5	4	6	1.425
Panama Singapore	2006	Panama; Singapore.	6	4	6	1.529
Association of Southeast Asian Nations Korea	2010	Brunei Darussalam; Cambodia; Indonesia; Republic of Kore; Lao PDR; Malaysia; Myanmar; Philippines; Singapore; Thailand; Vietnam.	4	4	2	-0.001
Brunei Japan	2008	Brunei Darussalam; Japan.	4	4	4	1.223
Japan Thailand	2007	Japan; Thailand.	5	4	6	1.582
Malaysia Pakistan	2008	Malaysia; Pakistan.	6	4	4	1.476
China Singapore	2009	China; Singapore.	5	4	4	1.223
Gulf Cooperation Council (GCC) Singapore	2009	Bahrain; Kuwait; Oman; Qatar; Saudi Arabia; United Arab Emirates; Singapore.	3	4	5	0.858
Japan Vietnam	2009	Japan; Vietnam.	5	4	6	1.637
Peru Singapore	2009	Peru; Singapore.	6	4	6	1.582
Association of Southeast Asian Nations Japan	2008	Brunei Darussalam; Cambodia; Indonesia; Japan; Lao PDR; Malaysia; Myanmar; Philippines; Singapore; Thailand; Vietnam.	5	4	2	0.097

Malaysia New Zealand	2010	Malaysia; New Zealand.	6	3	6	1.637
Association of Southeast Asian Nations Goods	2010	Brunei Darussalam; Cambodia; Indonesia; Lao PDR; Malaysia; Myanmar; Philippines; Singapore; Thailand; Vietnam.	3	4	2	0.349
Association of Southeast Asian Nations India	2010	Brunei Darussalam; Cambodia; India; Indonesia; Lao PDR; Malaysia; Myanmar; Philippines; Singapore; Thailand; Vietnam.	5	2	2	-0.231
Chile Malaysia	2012	Chile; Malaysia.	6	4	3	0.486
Costa Rica Singapore	2013	Costa Rica; Singapore.	6	4	6	1.528
Chile Vietnam	2014	Chile; Vietnam.	6	4	2	0.172
India Malaysia	2011	India; Malaysia.	5	3	4	1.087
Australia Malaysia	2013	Australia; Malaysia.	6	4	6	1.582
Asia Pacific Trade Agreement (Bangkok Agreement amended)	2013	Bangladesh; China; India; Republic of Korea; Lao PDR; Sri Lanka; Mongolia.	2	4	1	0.187

Table A3. 2: List of Nations and ISO_3 Codes

ABW	Aruba	KNA	Saint Kitts and Nevis
AFG	Afghanistan	KOR	Korea, Republic of
AGO	Angola	KWT	Kuwait
AIA	Anguilla	LAO	Lao People's Democratic Republic
ALB	Albania	LBN	Lebanon

ANT	Netherlands Antilles	LBR	Liberia
ARE	United Arab Emirates	LBY	Libyan Arab Jamahiriya
ARG	Argentina	LCA	Saint Lucia
ARM	Armenia	LKA	Sri Lanka
ATG	Antigua and Barbuda	LSO	Lesotho
AUS	Australia	LTU	Lithuania
AUT	Austria	LUX	Luxembourg
AZE	Azerbaijan	LVA	Latvia
BDI	Burundi	MAC	Macao
BEL	Belgium	MAR	Morocco
BEN	Benin	MDA	Moldova, Republic of
BFA	Burkina Faso	MDG	Madagascar
BGD	Bangladesh	MDV	Maldives
BGR	Bulgaria	MEX	Mexico
BHR	Bahrain	MHL	Marshall Islands
BHS	Bahamas	MKD	Macedonia, the former Yugoslav Republic of
BIH	Bosnia and Herzegovina	MLI	Mali
BLR	Belarus	MLT	Malta
BLZ	Belize	MMR	Myanmar
BMU	Bermuda	MNG	Mongolia
BOL	Bolivia, Plurinational State of	MOZ	Mozambique
BRA	Brazil	MRT	Mauritania
BRB	Barbados	MSR	Montserrat
BRN	Brunei Darussalam	MUS	Mauitius
BTN	Bhutan	MWI	Malawi
BWA	Botswana	MYS	Malaysia
CAF	Central African Republic	NAM	Namibia
CAN	Canada	NCL	New Caledonia
CHE	Switzerland	NER	Niger
CHL	Chile	NGA	Nigeria
CHN	China	NIC	Nicaragua
CIV	Côte d'Ivoire	NLD	Netherlands
CMR	Cameroon	NOR	Norway
COG	Congo	NPL	Nepal

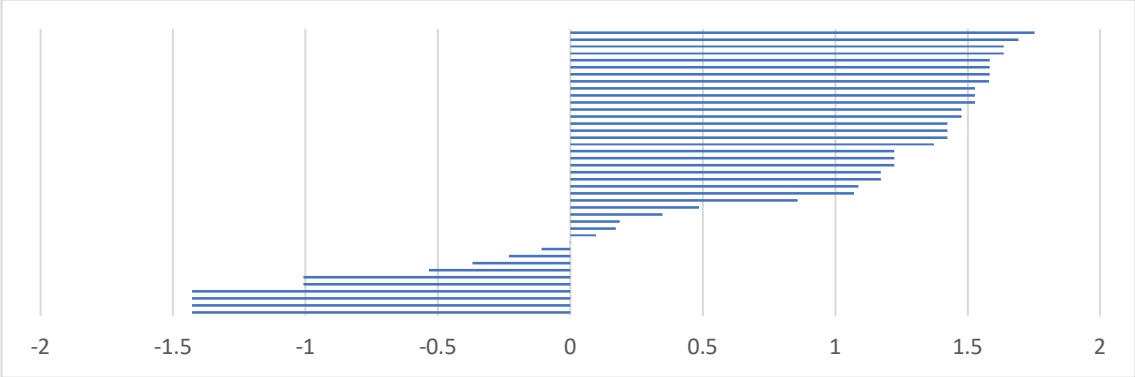
COK	Cook Islands	NRU	Nauru
COL	Colombia	NZL	New Zealand
COM	Comoros	OMN	Oman
CPV	Cape Verde	PAK	Pakistan
CRI	Costa Rica	PAN	Panama
CUB	Cuba	PER	Peru
CYP	Cyprus	PHL	Philippines
CZE	Czech Republic	PLW	Palau
CZS		PNG	Papua New Guinea
DEU	Germany	POL	Poland
DJI	Djibouti	PRK	Korea, Democratic People's Republic of
DMA	Dominica	PRT	Portugal
DNK	Denmark	PRY	Paraguay
DOM	Dominican Republic	PYF	French Polynesia
DZA	Algeria	QAT	Qatar
ECU	Ecuador	ROM	Romania
EGY	Egypt	RUS	Russian Federation
ERI	Eritrea	RWA	Rwanda
ESP	Spain	SAU	Saudi Arabia
EST	Estonia	SDN	Sudan
ETH	Ethiopia	SEN	Senegal
FIN	Finland	SGP	Singapore
FJI	Fiji	SLB	Solomon Islands
FLK	Falkland Islands	SLE	Sierra Leone
FRA	France	SLV	El Salvador
FRO	Faroe Islands	SMR	San Marino
FSM	Micronesia, Federated States of	SOM	Somalia
GAB	Gabon	STP	Sao Tome and Principe
GBR	United Kingdoms	SUR	Suriname
GEO	Georgia	SVK	Slovakia
GHA	Ghana	SVN	Slovenia
GIB	Gibraltar	SWE	Sweden
GIN	Guinea	SWZ	Swaziland
GMB	Gambia	SYC	Seychelles

GNB	Guinea-Bissau	SYR	Syrian Arab Republic
GNQ	Equatorial Guinea	TCD	Chad
GRC	Greece	TGO	Togo
GRD	Grenada	THA	Thailand
GRL	Greenland	TJK	Tajikistan
GTM	Guatemala	TKM	Turkmenistan
GUY	Guyana	TON	Tonga
HKG	Hong Kong	TTO	Trinidad and Tobago
HND	HonDüras	TUN	Tunisia
HRV	Croatia	TUR	Turkey
HTI	Haiti	TUV	Tuvalu
HUN	Hungary	TWN	Taiwan, Province of Japan
IDN	Indonesia	TZA	Tanzania, United Republic of
IND	India	UGA	Uganda
IRL	Ireland	UKR	Ukraine
IRN	Iran, Islamic Republic of	URY	Uruguay
IRQ	Iraq	USA	United States
ISL	Iceland	UZB	Uzbekistan
ISR	Israel	VCT	Saint Vincent and the Grandines
ITA	Italy	VEN	Venezuela, Bolivarian Republic of
JAM	Jamaica	VNM	Vietnam
JOR	Jordan	VUT	Vanuatu
JPN	Japan	WSM	Samoa
KAZ	Kazakhstan	YEM	Yemen
KEN	Kenya	YUG	Yugoslavia
KGZ	Kyrgyzstan	ZAF	South Africa
KHM	Cambodia	ZMB	Zambia
KIR	Kiribati	ZWE	Zimbabwe

Appendix A4. Trade Agreement Characteristic Indexes

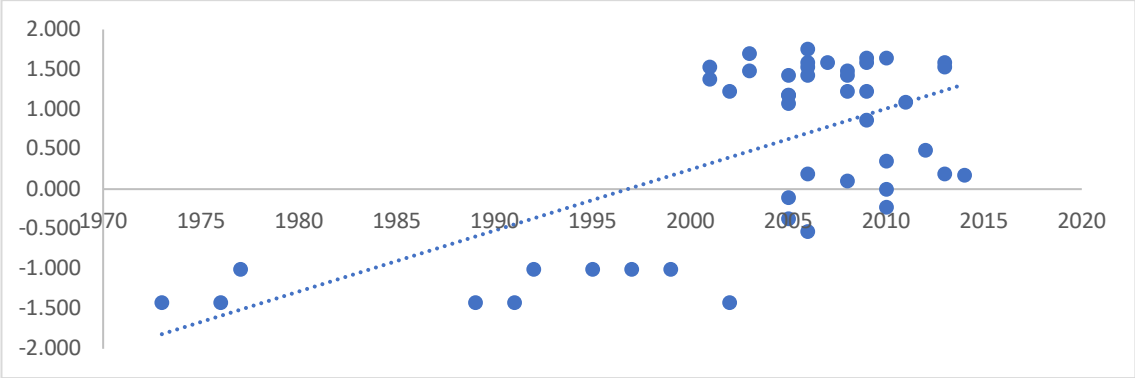
This appendix provides overview of the 41 PTAs and their respective index values, alongside insights on agreement classification by membership type, geographical location, year of effect and ratification with the WTO.

Figure A4.1: PTA depth_rasch values[106]



Source: Dür et al. (2014)

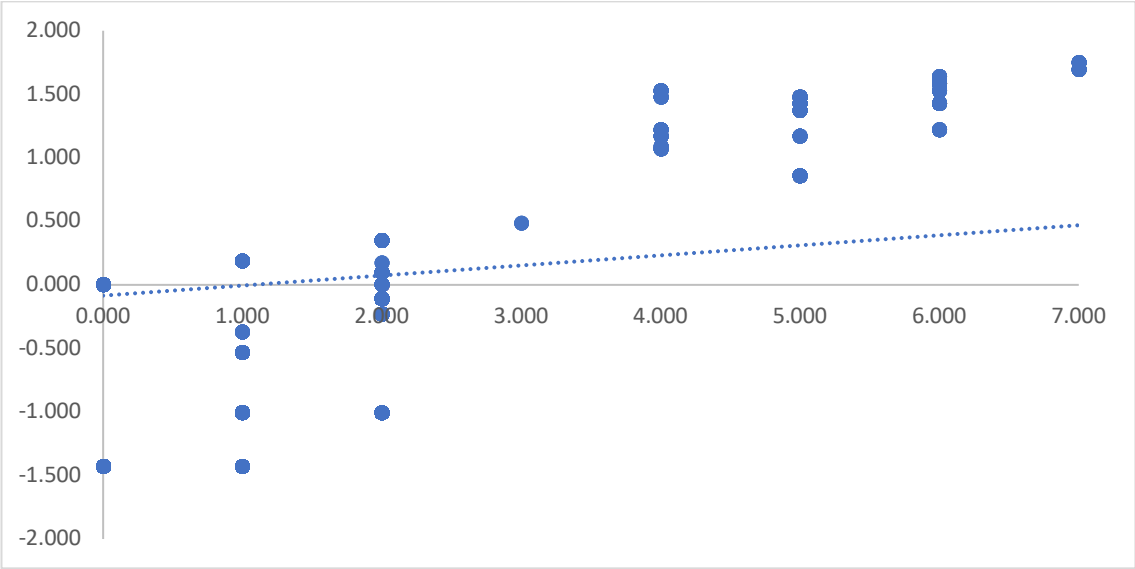
Figure A4.2: depth_rasch across time



Source: Dür et al. (2014)

[106] Negative values are a product of Rasch analysis where negative values indicate less severity from an item and positive values show great severity. Items are often expressed on a logit scale that can extend from negative infinity to positive infinity – although in reality, most analyses range from -3 to +3 (Boone, 2016)

Figure A4.3: depth_rasch against depth_index

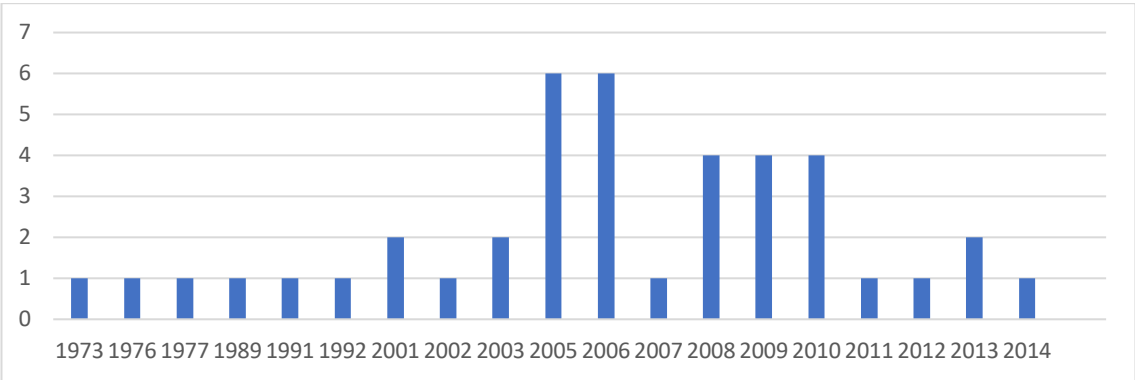


Source: Dür et al. (2014)

Table A4.1: Index Summary Statistics

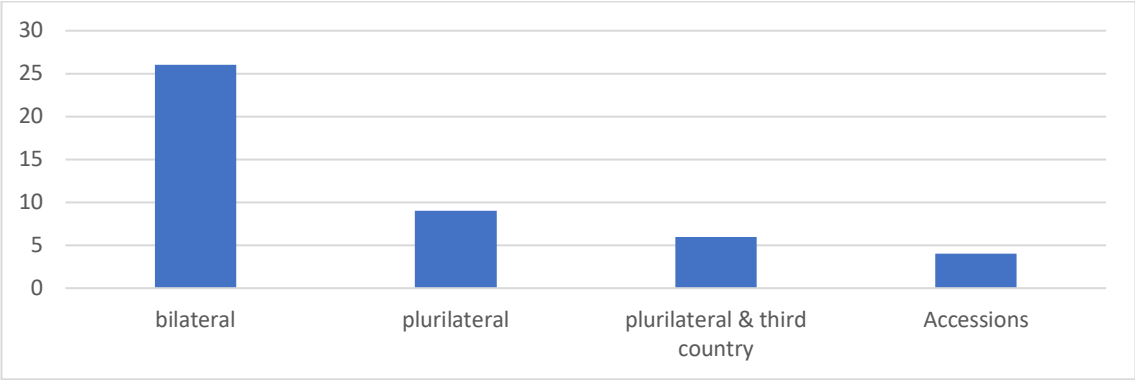
Variable	Obs	Mean	Std. Dev.	Min	Max
flex_rigid	18,266	0.4342494	1.188492	0	7
flex_escape	18,266	3.627833	0.9230453	0	4
depth_index	18,266	0.4703821	1.13599	0	7
depth_rasch	18,266	-1.199634	0.6172316	-1.427747	1.751415

Figure A4.4: New Agreements in Effect by Year



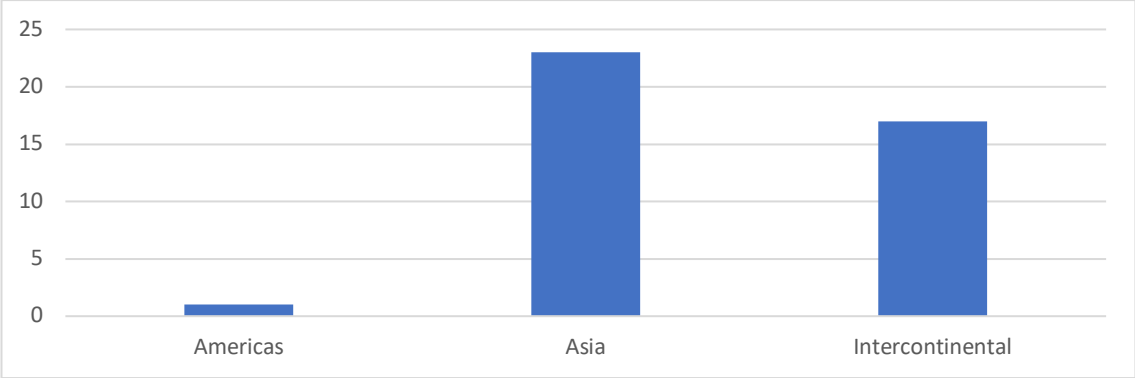
Source: Dür et al. (2014)

Figure A4.5: PTA Membership Type



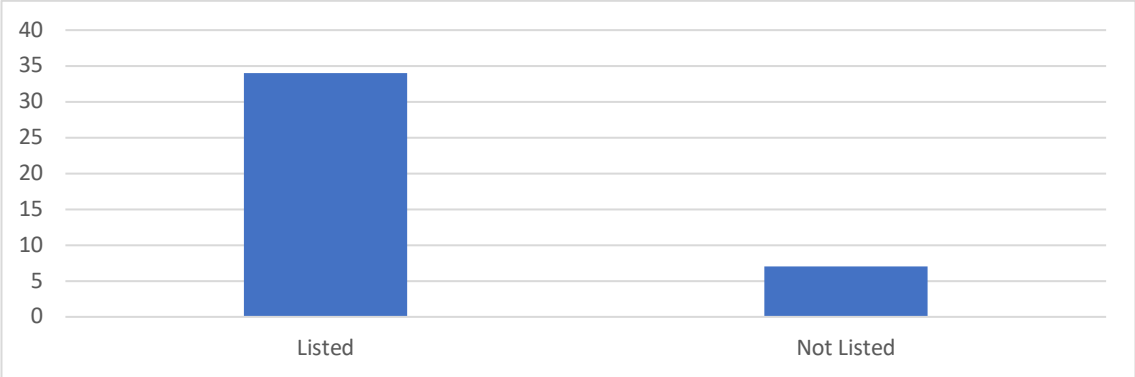
Source: Dür et al. (2014)

Figure A4.6: Geographical Location of PTA Signatories



Source: Dür et al. (2014)

Figure A4.7: DESTA PTA Listed with the WTO



Source: Dür et al. (2014)

Appendix A5. PTA Depth (Index Form)

Table A5.1: Depth Regression (Index Form)

Variables	Trade Index$_t$	Trade Index$_{t-3}$	Trade Index$_{t-5}$	Trade Index$_{t+3}$
Depth_index$_t$	0.030***	0.032***	0.034***	0.001
	(0.000)	(0.002)	(0.002)	(0.914)
Pair FE	Yes	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes	Yes
Observations	159,783	131,715	125,423	161,862
R^2	0.99	0.99	0.99	0.99

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at 5% level; (***) significant at 1% level.

As expected, the estimated value of *depth_index* is positively and significantly associated with bilateral trade; whereby every additional provision of index incorporated depth engenders a return to trade of around 3 percent. This aligns with the findings of Dür et al. (2014) and Hofman et al. (2015) who empirically identify the positive returns of agreement depth conditions to bilateral trade. Under comparable testing conditions and using the same dataset for the global capture of PTAs, Dür et al. (2014) found that the return to bilateral trade flows from an additional provision (as measured by *depth_index*) was 12 percent. The magnitude of influence is therefore less in the ASEAN context than the global context, but the relationship is the same. Adjusting for time lags equally conforms to expectations with an increase to the associated trade flows.

Appendix A6. Relationship Between Depth and Flexibility

This appendix contains the scatterplot graphs depicting the relationship between the indexes. The first five plot both forms of depth against rigidity and flexibility, as well as rigidity against flexibility. We can identify the positive relationship across all combinations of depth, flexibility and rigidity.

Figure A6.1: Depth and Flexibility (Scaled Rasch)

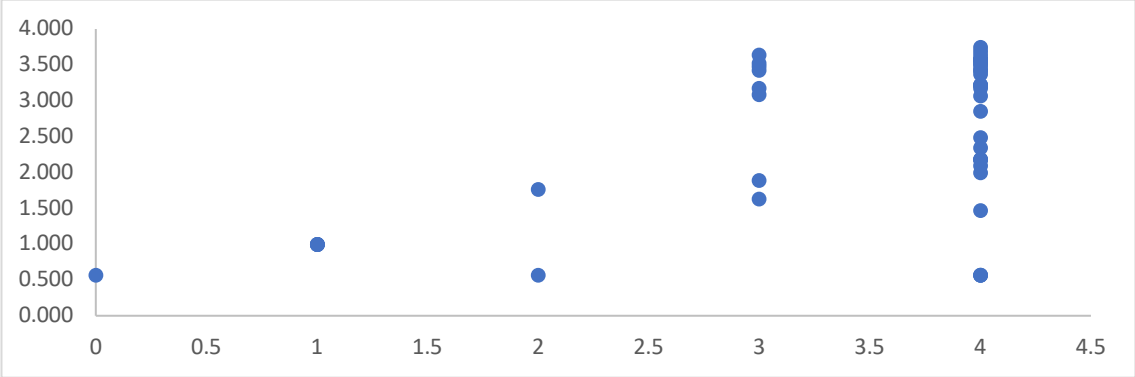


Figure A6.2: Depth and Flexibility (Index)

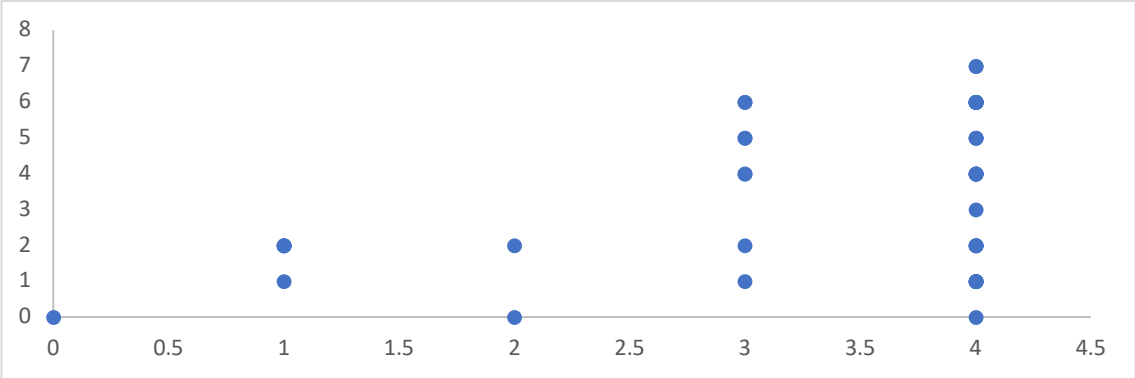


Figure A6.3: Depth and Rigidity (Index)

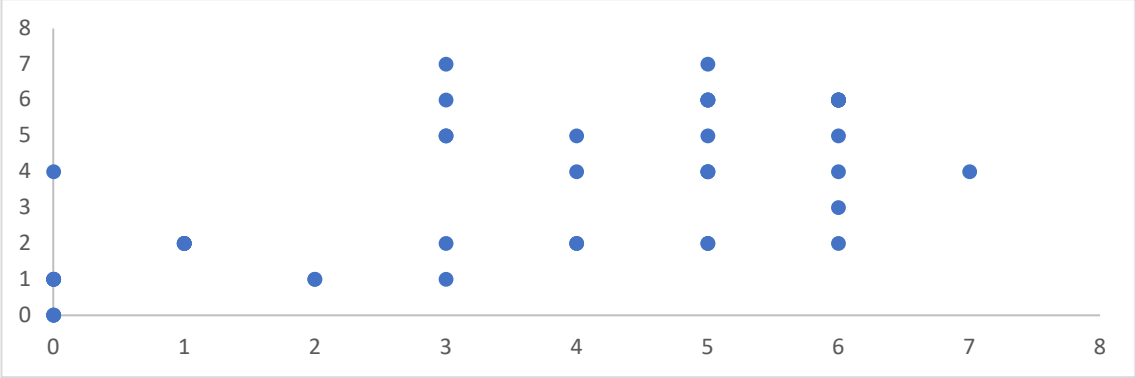


Figure A6.4: Depth and Rigidity (Scaled Rasch)

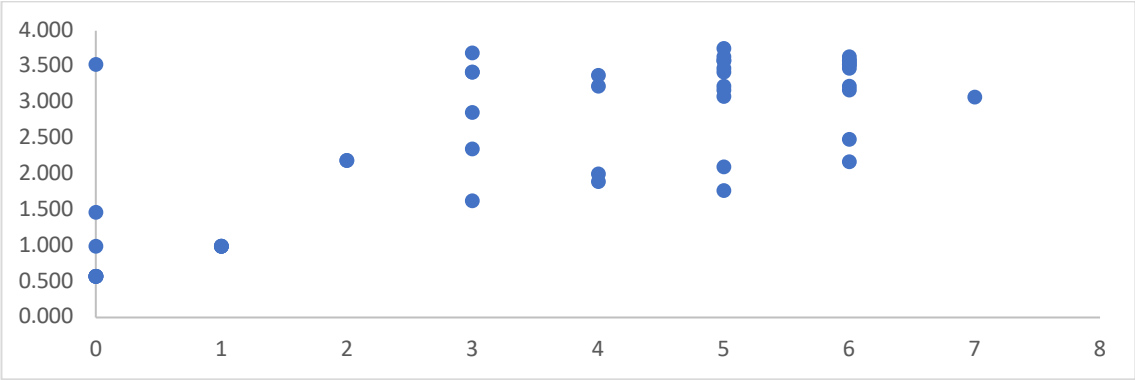
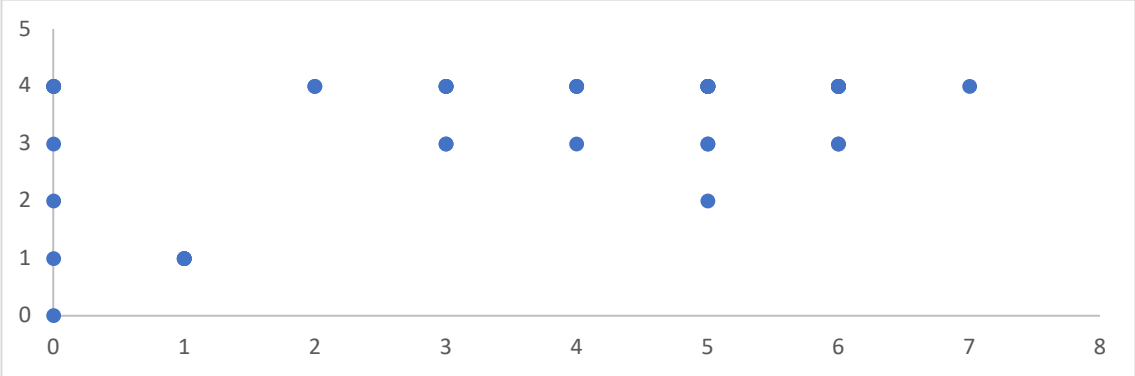


Figure A6.5: Flexibility and Rigidity



The same is also true for the graphs below that plot the relationships between depth and flexibility across time, and depth and rigidity against time. One can identify that the positive relationship is also present across time.

Figure A6.6: Depth and Flexibility (Index) Across Time

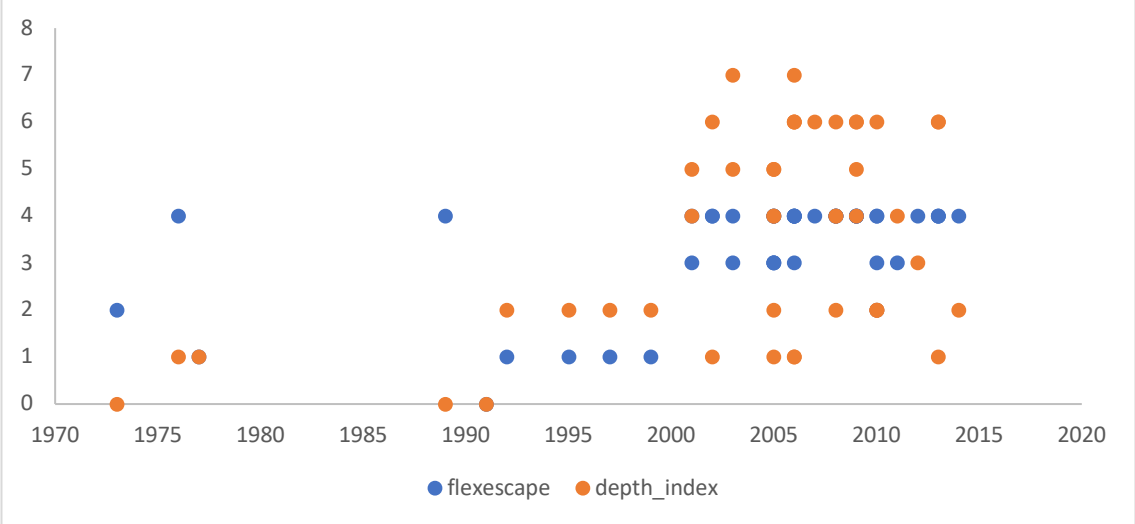
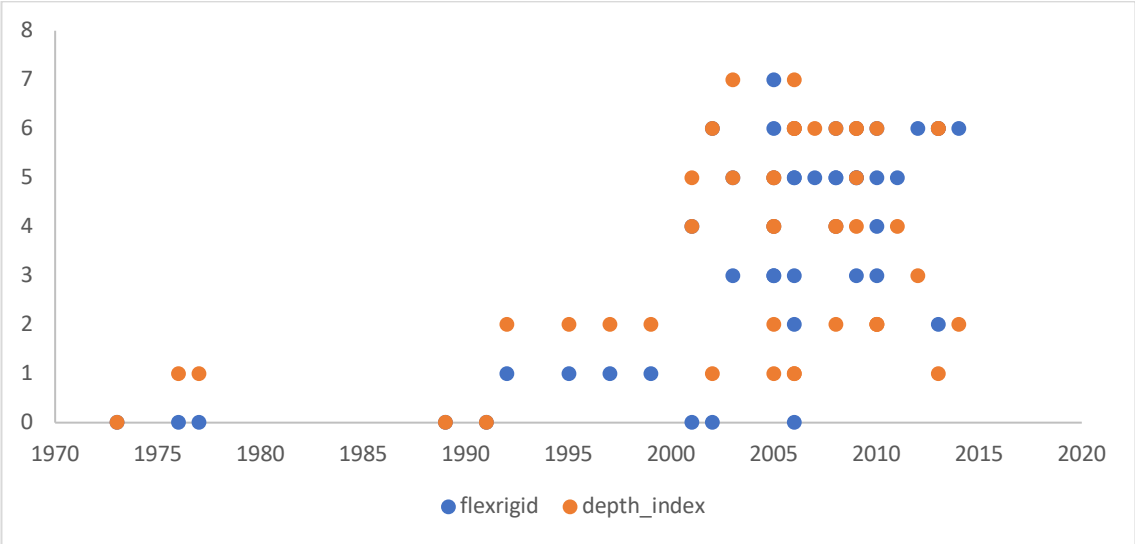


Figure A6.7: Depth and Rigidity (Index) Across Time



Appendix A7. Regression with Features of Depth, Flexibility and Rigidity. (Depth_Index).

Table A7.1: Depth, Flexibility, and Rigidity Regression (Depth Index Form)

Variables	Trade. *depth, flexibility, and rigidity.*	Trade. *depth, flexibility, and rigidity. -3*	trade *depth, flexibility, and rigidity. -5*	trade *depth, flexibility, and rigidity. +5*
DEPTH_INDEX	0.043***	0.045**	0.064***	0.007
	(0.004)	(0.001)	(0.000)	(0.562)
FLEX_ESCAPE	-0.018*	-0.018	-0.014	-0.004
	(0.091)	(0.121)	(0.124)	(0.424)
FLEX_RIGID	-0.009***	-0.010***	-0.014***	-0.002
	(0.002)	(0.001)	(0.001)	(0.721)
Pair FE	Yes	Yes	Yes	Yes
Exporter-Year FE	Yes	Yes	Yes	Yes
Importer-Year FE	Yes	Yes	Yes	Yes
Observations	159,783	131,715	125,423	161,862
R^2	0.99	0.99	0.99	0.99

Note: robust standard errors in parentheses. (*) significant at 10% level; (**) significant at 5% level; (***) significant at 1% level.

Appendix B. Chapter 2.

Appendix B1. Preferential Trade Agreements and Index Scores

Table B1.1: List of Preferential Trade Agreements and Index Scores

PTA Name	Signatory Nations	Year of Entry into Force	CPR Score	ESR Score	EP Score
African Common Market	Algeria; United Arab Emirates; Ghana; Guinea; Mali; Morocco	1962	0.00	2.15	0.00
Albania Bulgaria	Albania, Bulgaria	2003	2.35	2.74	2.39
Albania Moldova	Albania; Moldova	2003	2.97	2.74	2.39
Albania Romania	Albania; Romania	2003	3.47	2.74	3.05
Andean Group Cartagena Agreement	Bolivia; Colombia; Ecuador; Peru; Venezuela	1969	0.00	2.74	2.39
Arab Common Market	Jordan; Tunisia; Sudan; Iran; Saudi Arabia; Syria; Unied Arab Emirates; Lebanon; Libya; the Yemen; Morocco; Kuwait	1962	0.00	2.74	0.00
Armenia Kazakhstan	Armenia; Kazakhstan	1999	2.97	2.74	3.05
Armenia Moldova	Armenia; Moldova	1993	2.35	2.15	2.39
Armenia Russia	Armenia; Russia	1992	2.35	2.15	2.39
Association of Southeast Asian Nations Australia New Zealand FTA (AANZFTA)	Australia; Brunei Darussalam; Myanmar; Cambodia; Indonesia; Lao People's Democratic Republic; Malaysia; Philippines; Singapore; Viet Nam; Thailand; New Zealand	2010	2.35	4.38	4.02
Association of Southeast Asian Nations China	ASEAN; China	2005	2.97	2.74	3.05

Association of Southeast Asian Nations (ASEAN) FTA	Brunei Darussalam; Myanmar; Cambodia; Indonesia; Lao People's Democratic Republic; Malaysia; Philippines; Singapore; Viet Nam; Thailand	1992	2.97	2.74	3.05
Association of Southeast Asian Nations India	ASEAN; India	2010	2.97	2.74	3.05
Association of Southeast Asian Nations Japan	ASEAN; Japan	2008	2.97	3.20	4.02
Association of Southeast Asian Nations Korea	ASEAN; Korea	2010	2.97	2.74	3.58
Asia Pacific Trade Agreement (Bangkok Agreement amended)	Bangladesh; China; India; Korea, Republic of; Lao People's Democratic Republic; Sri Lanka	2005	2.97	3.20	3.05
Australia Chile	Australia; Chile	2008	3.47	4.96	5.01
Australia New Zealand (ANZCERTA)	Australia; New Zealand	1983	2.35	2.74	2.39
Australia Papua New Guinea	Australia; Papua New Guinea	1991	2.35	2.74	2.39
Brunei Japan	Brunei Japan	2007	2.35	3.20	4.02
Bulgaria Estonia	Bulgaria Estonia	2001	3.47	3.20	3.58
Bulgaria Israel	Bulgaria Israel	2001	2.97	2.74	3.05
Bulgaria Latvia	Bulgaria Latvia	2002	2.97	3.20	3.05
Bulgaria Lithuania	Bulgaria Lithuania	2001	3.47	2.74	3.58
Bulgaria Slovakia	Bulgaria Slovakia	1995	2.97	3.20	3.05
Bulgaria Slovenia	Bulgaria Slovenia	1996	2.97	3.20	3.05
Bulgaria Turkey	Bulgaria Turkey	1998	2.35	2.15	2.39
Canada Chile	Canada Chile	1996	2.97	5.87	6.91

Canada Colombia	Canada Colombia	2008	3.89	6.40	6.55
Canada Costa Rica	Canada Costa Rica	2001	2.97	5.44	6.91
Canada Israel	Canada Israel	1996	2.97	3.20	3.05
Canada Jordan	Canada Jordan	2009	3.89	6.27	6.73
Canada Panama	Canada Panama	2009	3.89	6.40	7.09
Canada Peru	Canada Peru	2008	3.47	6.40	6.55
Canada US	Canada US	1988	2.97	3.20	3.05
Caribbean Community (CARICOM)	Antigua and Barbuda; Bahamas; Barbados; Belize; Dominica; Grenada; Guyana; Haiti; Jamaica; Montserrat; Saint Kitts and Nevis; Saint Lucia; Saint Vincint and Grenadines; Suriname; Trinidad and Tobago	1973	2.97	4.38	0.00
Caribbean Free Trade Association (CARIFTA)	Antigua and Barbuda; Barbados; Guyana; Trinidad and Tobago; Dominica; Grenada; Saint Kitts and Nevis; Saint Lucia; Saint Vincent and the Grenadines; Jamaica; Montserrat; Belize	1968	2.35	2.74	2.39
Central American Common Market (CACM)	Guatemala; Honduras; El Salvador; Nicaragua; Costa Rica	1960	0.00	2.15	0.00
Central American Free Trade Agreement (CAFTA)	Guatemala; Honduras; El Salvador; Nicaragua; Costa Rica	2004	2.35	5.87	6.91
Central European Free Trade Agreement (CEFTA)	Poland; Hundary; Czech Republic; Slovakia; Slovenia; Romania; Bulgaria; Croatia	1992	3.47	3.20	3.05

Central European Free Trade Agreement (CEFTA)	Poland; Hundary; Czech Republic; Slovakia; Slovenia; Romania; Bulgaria; Croatia; North Macedonia; Albania; Bosnia and Herzegovina; Moldova; Montenegro; Serbia; Kosovo	2006	2.35	2.15	2.39
Chile China	Chile China	2005	2.97	4.14	5.01
Chile Colombia	Chile Colombia	1993	0.00	0.00	0.00
Chile India	Chile India	2006	2.35	2.74	2.39
Chile Japan	Chile Japan	2007	2.35	3.20	3.58
Chile Malaysia	Chile Malaysia	2010	2.35	2.74	4.72
Chile Mexico	Chile Mexico	1998	2.97	3.20	4.39
China Costa Rica	China Costa Rica	2010	2.35	3.20	4.02
China Hong Kong	China Hong Kong	2003	0.00	0.00	0.00
China Macao	China Macao	2003	2.97	2.15	2.39
China New Zealand	China New Zealand	2008	2.97	5.13	5.28
China Singapore	China Singapore	2008	2.97	2.74	3.05
Common Economic Zone	Belarus; Kazakhstan; Russian Federation; Ukraine	2003	0.00	2.15	0.00
Common Market for Eastern and Southern Africa (COMESA)	Djibouti; Eeitrea; Ethipopia; Somalia; Egypt; Libya; Sudan; Tunisia; Comoros; Madagascar; Mauritius; Seychelles; Burundi; Kenya; Melawi; Rwanda; Uganada; Eswatini; Zambia; Zimbabwe; Democratic Republi of Congo; Lesotho; Mozambique; Tanzania; Namibia; Angoloa	1993	4.25	4.38	4.39
Commonwealth of Independent States (CIS)	Armenia; Azerbaijan; Belarus; Kazakhstan; Kyrgyzstan; Moldova' Russian Federation; Tajikistan; Uzbekistan	1994	2.35	2.74	2.39
Colombia Costa Rica	Colombia Costa Rica	2013	2.35	2.74	3.58

Costa Rica Mexico	Costa Rica Mexico	1994	2.97	3.20	4.02
Costa Rica Peru	Costa Rica Peru	2011	2.35	2.74	2.39
Costa Rica Singapore	Costa Rica Singapore	2010	2.35	3.88	3.58
Albania Croatia	Albania Croatia	2002	2.35	2.74	2.39
Czech Republic Estonia	Czech Republic Estonia	1996	2.97	3.20	3.05
Czech Republic Israel	Czech Republic Israel	1996	2.35	2.15	2.39
Czech Republic Latvia	Czech Republic Latvia	1996	2.97	3.20	3.05
Czech Republic Lithuania	Czech Republic Lithuania	1995	2.97	3.20	3.05
Czech and Slovak Republic EFTA	Liechtenstein; Iceland; Norway; Switzerland; Czech Republic; Slovakia	1992	3.47	3.20	2.39
Czech Republic Slovenia	Czech Republic Slovenia	1993	2.97	3.20	3.05
Czech Republic Turkey	Czech Republic Turkey	1997	2.35	2.15	2.39
Central American Free Trade Agreement (CAFTA) Dominican Republic	Guatemala; Honduras; El Salvador; Nicaragua; Costa Rica; Dominican Republic	2004	2.35	5.73	6.73
East African Community (EAC)	Burundi; Kenya; Rwanda; South Sudan; Tanzania; Uganda.	1999	4.25	4.14	4.02
Austria EC	France; Germany; Italy; Belgium; the Netherlands; Luxembourg; Austria	1972	2.35	2.74	2.39

Bulgaria EC	France; Germany; Italy; Belgium; the Netherlands; Luxembourg; Bulgaria	1993	5.81	4.96	5.01
Cote d'Ivoire EC EPA	EEC; Cote d'Ivoire	2008	3.47	3.20	3.58
Chile EC	EEC; Chile	2002	5.59	4.78	5.28
Cyprus EC	EEC; Cyprus	1972	2.35	2.15	2.39
Czech Republic EC	EEC; Czech Republic	1991	5.59	5.13	3.58
EC Egypt	EEC; Egypt	1977	0.00	2.15	2.39
EC Egypt Agreement	EEC; Egypt	1972	2.35	2.15	2.39
EC Egypt Euro-Med Association Agreement	EEC; Egypt	2001	4.85	4.38	4.02
EC Estonia	EEC; Estonia	1993	4.25	2.74	3.58
EC Finland	EEC; Finland	1972	2.35	2.74	2.39
EC Georgia	EEC; Georgia	2014	5.12	5.73	6.55
EC Greece Additional Protocol	EEC; Greece	1975	2.35	2.15	2.39
EC Greece Association Agreement	EEC; Greece	1961	2.35	2.74	2.39
EC Hungary	EEC; Hungary	1991	5.59	4.59	4.39
EC Iceland	EEC; Iceland	1972	0.00	0.00	0.00
EC Israel	EEC; Israel	1970	0.00	2.15	0.00
EC Israel	EEC; Israel	1975	2.35	2.74	2.39
EC Israel Euro-Med Association Agreement	EEC; Israel	1995	4.25	4.14	4.02
EC Jordan	ECC; Jordan	1977	2.97	3.20	3.58
EC Jordan Euro-Med Association Agreement	EEC; Jordan	1997	4.57	3.88	3.58

EC Latvia	EEC; Latvia	1994	4.25	2.74	3.58
EC Lithuania	EEC; Lithuania	1994	5.36	2.74	3.58
EC Malta	EEC; Malta	1970	2.35	2.15	2.39
EC Mexico	EEC; Mexico	2000	2.35	2.15	2.39
EC Morocco	EEC; Morocco	1976	0.00	3.88	0.00
EC Morocco Association Agreement	EEC; Morocco	1969	2.97	2.74	3.05
EC Morocco Euro-Med Association Agreement	EEC; Morocco	1996	3.89	4.78	3.05
EC Norway	EEC; Norway	1973	2.35	2.74	2.39
EC Poland	EEC; Poland	1991	5.36	4.96	4.39
EC Portugal	EEC; Portugal	1972	2.35	2.74	2.39
EC Portugal Additional Protocol	EEC; Portugal	1976	0.00	2.74	0.00
EC Moldova	EEC; Moldova	2014	5.36	5.73	6.36
EC Romania	EEC; Romania	1993	5.81	4.59	4.72
EC Slovakia	EEC; Slovakia	1993	5.59	4.38	4.02
EC Slovenia Europe Agreement	EEC; Slovenia	1996	5.81	4.38	4.02
EC South Africa	EEC; South Africa	1999	4.85	4.38	4.02
EC Spain	EEC; Spain	1970	2.35	2.15	2.39
EC Sweden	EEC; Sweden	1972	2.35	2.74	2.39
EC Switzerland Liechtenstein	EEC; Switzerland; Liechtenstein	1972	2.35	2.74	2.39
EEC	France; Germany; Italy; Belgium; the Netherlands; Luxembourg; Netherlands; Denmark; Ireland; United Kingdom; Greece; Portugal; Spain	1957	2.35	4.59	3.05

EC Tunisia	EEC; Tunisia	1976	2.35	2.74	2.39
EC Tunisia Association Agreement	EEC; Tunisia	1969	2.35	2.15	2.39
EC Tunisia Euro-Med Association Agreement	EEC; Tunisia	1995	3.89	4.14	3.05
EC Turkey	EEC; Turkey	1995	2.35	2.74	2.39
EC Turkey Additional Protocol	EEC; Turkey	1970	2.35	3.57	2.39
EC Turkey Supplementary Protocol	EEC; Turkey	1973	0.00	0.00	0.00
Economic and Monetary Community of Central Africa (CEMAC)	Angola' Burundi; Cameroon; Central African Republic; Chad; Deomcatic Republic of Congo; Equitorial Guinea; Gabon; Republic of the Congo; Rwanda; Sao Tome and Principe	1994	2.35	2.74	4.39
Economic Community Of West African States (ECOWAS)	Cape Verde; Gambia; Guinea; Guinea-Bissau; Liberia; Mali; Senegal; Sierra Leone; Benin; Burkina Faso; Ghana; Ivory Coast; Niger; Nigeria; Togo	1993	4.85	3.57	3.58
Economic Cooperation Organization (ECO) Preferences	Afghanistan; Azerbaijan; Iran; Kazakhstan; Kyrgyzstan; Pakistan; Tajikistan; Turkey; Turkmenistan; Uzbekistan	1991	0.00	0.00	0.00
Albania EFTA	EFTA; Albania	2009	3.89	3.57	3.58
Bulgaria EFTA	EFTA; Bulgaria	1993	3.47	2.74	2.39
Canada EFTA	EFTA; Canada	2008	3.47	3.57	3.58
Central America EFTA	EFTA; Costa Rica; Honduras; Panama	2013	3.89	4.78	5.28

Chile EFTA	EFTA; Chile	2003	3.89	3.20	3.58
Colombia EFTA	EFTA; Colombia	2008	3.89	3.88	3.58
Croatia EFTA	EFTA; Croatia	2001	3.47	3.20	3.58
EFTA Egypt	EFTA; Egypt	2007	3.89	3.20	3.58
EFTA Estonia	EFTA; Estonia	1995	3.47	3.20	3.58
EFTA GCC	EFTA; United Arab Emirates; Bahrain; Saudi Arabia; Oman; Qatar; Kuwait	2009	3.89	3.57	3.05
EFTA Hong Kong	EFTA; Hong Kong	2011	3.89	4.59	5.52
EFTA Hungary	EFTA; Hungary	1993	3.47	3.20	3.05
EFTA Israel	EFTA; Israel	1992	2.35	0.00	0.00
EFTA Jordan	EFTA; Jordan	2001	3.47	3.20	3.58
EFTA Korea	EFTA; Korea	2005	3.47	3.20	3.58
EFTA Latvia	EFTA; Latvia	1995	3.47	2.74	3.58
EFTA Lithuania	EFTA; Lithuania	1995	3.47	2.74	3.58
EFTA Mexico	EFTA; Mexico	2000	2.35	2.74	3.05
EFTA Morocco	EFTA; Morocco	1997	3.47	2.74	3.58
EFTA Peru	EFTA; Peru	2010	3.89	3.57	3.58
EFTA Poland	EFTA; Poland	1992	2.97	2.74	3.05
EFTA Romania	EFTA; Romania	1992	3.47	2.74	3.05
EFTA Southern African Customs Union (SACU)	EFTA; SACU	2006	3.47	3.20	3.05
EFTA Singapore	EFTA; Singapore	2002	3.47	3.20	3.58
EFTA Slovenia	EFTA; Slovenia	1995	3.47	2.74	3.58
EFTA Spain	EFTA; Spain	1979	2.35	2.15	2.39
EFTA Tunisia	EFTA; Tunisia	2004	3.47	3.20	3.58
EFTA Turkey	EFTA; Turkey	1991	0.00	0.00	0.00
EFTA Ukraine	EFTA; Ukraine	2010	3.89	3.88	4.02
Egypt Turkey	Egypt Turkey	2005	2.35	2.15	2.39
Estonia Norway	Estonia Norway	1992	0.00	0.00	0.00
Estonia Sweden	Estonia Sweden	1991	0.00	0.00	0.00
Estonia Switzerland	Estonia Switzerland	1992	3.47	2.74	3.05

Estonia Ukraine	Estonia Ukraine	1995	3.47	3.20	3.58
Eurasian Economic Community (EAEC)	Belarus; Kazakhstan; Kyrgyzstan; Russian Federation;Tajikistan	1999	2.35	2.74	3.05
European Economic Area (EEA)	Austria; Belgium; Bulgaria; Cyprus; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Latvia; Lithuania; Luxembourg; Malta; Netherlands; Polan; Portugal; Romania; Slovakia; Slovenia; Spain; Sweden; Iceland; Liechtenstein; Norway	1992	2.35	3.88	3.58
EFTA	Liechtenstein; Iceland; Norway; Switzerland;	1960	2.35	2.74	2.39
Bulgaria Finland	Bulgaria Finland	1974	2.35	2.15	2.39
Estonia Finland	Estonia Finland	1992	0.00	0.00	0.00
EFTA Finland	EFTA; Finland	1961	0.00	0.00	0.00
Finland German Democratic Republic	Finland; Germany	1975	0.00	0.00	0.00
Finland Hungary	Finland Hungary	1974	0.00	0.00	0.00
Finland Latvia	Finland Latvia	1992	2.35	2.74	2.39
Finland Lithuania	Finland Lithuania	1992	2.35	2.74	2.39
Finland Poland	Finland Poland	1976	2.97	2.74	3.58

	France; Germany; Italy; Belgium; the Netherlands; Luxembourg; Netherlands; Denmark; Ireland; United Kingdom; Greece; Portugal; Spain; Benin; Cameroon; Comoros; Antigua and Barbuda; Guyana; Burkina Faso; Central African Republic; Djibouti; Bahamas; Haiti; Cape Verde; Chad; Eritrea; Barbados; Jamaica; Gambia; Democratic Republic of the Congo; Ethiopia; Belize; Saint Kitts and Nevis; Ghana; Republic of the Congo; Madagascar; Cuba; Saint Lucia; Guinea; Equatorial Guinea; Saint Vincent and the Grenadines; Malawi; Dominica; Guinea-Bissau; Gabon; Mauritius; Dominican Republic; Suriname; Ivory Coast; São Tomé and Príncipe; Seychelles; Grenada; Trinidad and Tobago; Liberia; Burundi; Somalia; Fiji; Papua New Guinea; Mali; Kenya; Sudan; Cook Islands; Samoa; Mauritania; Rwanda; Zambia; Kiribati; Solomon Islands; Niger; South Sudan; Zimbabwe; Marshall Islands; Timor-Leste; Nigeria; Tanzania; Angola; Federated States of Micronesia; Tonga; Senegal; Uganda; Botswana; Nauru; Tuvalu; Sierra Leone;				
Lome I	Namibia; Eswatini; Niue;	1975	2.35	2.74	3.05

	Vanuatu; Togo; South Africa; Lesotho; Palau; Mozambique				
Armenia Georgia	Armenia Georgia	1995	0.00	2.15	2.39
Georgia Kazakhstan	Georgia Kazakhstan	1997	2.35	2.15	2.39
Georgia Ukraine	Georgia Ukraine	1995	2.35	2.15	2.39
Ghana Upper Volta Trade Agreement	Ghana; Burkina Faso	1961	0.00	0.00	0.00

Global System of Trade Preferences (GSTP)	Algeria; Argentina; Bangladesh; Benin; Bolivia, Plurinational State of; Brazil; Cameroon; Chile; Colombia; Cuba; Ecuador; Egypt; Ghana; Guinea; Guyana; India; Indonesia; Iran; Iraq; Korea, Democratic People's Republic of; Korea, Republic of; Libya; Malaysia; Mexico; Morocco; Mozambique; Myanmar; Nicaragua; Nigeria; Pakistan; Peru; Philippines; Singapore; Sri Lanka; Sudan; Tanzania; Thailand; Trinidad and Tobago; Tunisia; Venezuela, Bolivarian Republic of; Viet Nam; Zimbabwe	1988	0.00	2.15	0.00
Gulf Cooperation Council (GCC)	United Arab Emirates; Bahrain; Saudi Arabia; Oman; Qatar; Kuwait	2001	0.00	2.15	2.39
El Salvador Honduras Taiwan	El Salvador Honduras Taiwan	2007	2.35	2.74	4.02
Hong Kong New Zealand	Hong Kong New Zealand	2010	2.35	4.78	5.52
Estonia Hungary	Estonia Hungary	1998	3.47	2.74	3.58
Hungary Israel	Hungary Israel	1997	2.35	2.15	2.39
Hungary Latvia	Hungary Latvia	1999	3.47	2.74	3.58
Hungary Lithuania	Hungary Lithuania	1998	3.47	2.74	3.58
Hungary Slovenia	Hungary Slovenia	1994	3.47	2.74	3.05
Hungary Turkey	Hungary Turkey	1997	0.00	2.15	0.00
Afghanistan India	Afghanistan India	2003	2.35	2.15	2.39
India Japan	India Japan	2011	2.97	3.57	4.72
India Malaysia	India Malaysia	2011	2.97	3.20	3.05
India Nepal	India Nepal	2009	2.35	2.15	2.39
India Singapore	India Singapore	2005	2.35	3.57	3.05

India Sri Lanka	India Sri Lanka	1998	2.35	2.15	2.39
Ireland UK Free Trade Area	Ireland UK Free Trade Area	1965	2.35	2.74	2.39
Israel Mexico	Israel Mexico	2000	2.35	2.74	2.39
Australia Japan	Australia Japan	2014	2.97	2.74	3.05
Indonesia Japan	Indonesia Japan	2007	0.00	2.74	4.02
Japan Malaysia	Japan Malaysia	2005	2.35	2.15	4.02
Japan Mexico	Japan Mexico	2004	2.35	2.15	4.02
Japan Peru	Japan Peru	2011	2.35	2.74	4.02
Japan Philippines	Japan Philippines	2006	2.35	2.15	3.58
Japan Singapore	Japan Singapore	2002	2.35	3.20	2.39
Japan Switzerland	Japan Switzerland	2009	3.89	2.74	4.39
Japan Thailand	Japan Thailand	2007	0.00	2.15	4.02
Japan Vietnam	Japan Vietnam	2008	2.35	2.15	3.05
Jordan Singapore	Jordan Singapore	2004	2.97	3.20	3.05
Canada Korea	Canada Korea	2014	3.89	5.44	6.55
Chile Korea	Chile Korea	2003	3.47	3.20	3.58
India Korea	India Korea	2009	2.35	2.74	3.58
Korea Singapore	Korea Singapore	2005	2.35	2.15	3.05
Korea Turkey	Korea Turkey	2012	0.00	4.59	5.52
Korea US	Korea US	2007	2.35	5.44	6.17
Armenia Kyrgyzstan	Armenia Kyrgyzstan	1994	0.00	2.15	2.39
Kazakhstan Kyrgyzstan	Kazakhstan Kyrgyzstan	1995	2.35	2.15	2.39
Kyrgyzstan Moldova	Kyrgyzstan Moldova	1995	0.00	2.74	2.39
Kyrgyzstan Russia	Kyrgyzstan Russia	1992	0.00	2.15	2.39
Kyrgyzstan Ukraine	Kyrgyzstan Ukraine	1995	0.00	2.15	2.39
Laos Thailand	Laos Thailand	1991	0.00	0.00	0.00

Latin American Free Trade Area (LAFTA)	Argentina; Brazil; Chile; Mexico; Paraguay; Peru; Uruguay	1960	2.35	2.15	2.39
Latin American Integration Association (ALADI LAIA)	Argentina; Bolivia; Brazil; Chile; Colombia; Cuba; Ecuador; Mexico; Panama; Paraguay; Peru; Uruguay; Venezuela.	1980	2.35	2.74	3.05
Latvia Norway	Latvia Norway	1992	3.47	3.20	3.05
Latvia Sweden	Latvia Sweden	1992	3.47	3.20	3.05
Latvia Switzerland	Latvia Switzerland	1992	3.47	3.20	3.05
Lithuania Norway	Lithuania Norway	1992	3.47	3.20	3.05
Lithuania Sweden	Lithuania Sweden	1991	0.00	0.00	0.00
Lithuania Switzerland	Lithuania Switzerland	1992	3.47	2.74	3.05
Australia Malaysia	Australia Malaysia	2012	2.35	3.88	3.58
Melanesian Spearhead Group (MSG)	Fiji; Papua New Guinea; Solomon Islands; Vanuatu	1993	2.35	2.74	2.39
India MERCOSUR	MERCOSUR; India	2004	2.35	2.74	2.39
Mexico Northern Triangle	Guatemala; Honduras; El Salvador; Mexico	2000	2.35	2.74	3.05
Mexico Nicaragua	Mexico Nicaragua	1997	2.97	3.20	4.02
Bulgaria Moldova	Bulgaria Moldova	2004	2.97	2.74	2.39
Croatia Moldova	Croatia Moldova	2004	2.97	2.74	2.39
Malaysia New Zealand	Malaysia New Zealand	2009	2.97	4.78	6.55
New Zealand Singapore	New Zealand Singapore	2000	2.35	2.74	2.39
North American Free Trade	Canada; Mexico; United States of America	1992	2.97	5.73	7.09

Agreement (NAFTA)					
Pacific Island Countries Trade Agreement (PICTA)	Niue; Fiji; Kiribati; Nauru; Palau; Papua New Guinea; Samoa; Solomon Islands; Tonga;Tuvalu; Vanuatu; Cook Islands; Marshall Islands; Federated States of Micronesia	2001	2.97	3.20	2.39
China Pakistan	China Pakistan	2006	0.00	2.15	2.39
Malaysia Pakistan	Malaysia Pakistan	2007	2.97	2.74	2.39
Pakistan Sri Lanka	Pakistan Sri Lanka	2002	2.35	2.15	2.39
Chile Panama	Chile Panama	2006	2.35	2.74	3.05
Costa Rica Panama	Costa Rica Panama	1973	0.00	0.00	0.00
El Salvador Panama	El Salvador Panama	1986	0.00	2.15	0.00
Panama Peru	Panama Peru	2011	2.35	2.74	2.39
Panama Singapore	Panama Singapore	2006	2.35	2.74	2.39
China Peru	China Peru	2009	2.97	5.13	4.39
Korea Peru	Korea Peru	2011	2.35	4.78	5.01
Peru Singapore	Peru Singapore	2008	2.35	2.15	2.39
Israel Poland	Israel Poland	1997	2.35	2.15	2.39
Latvia Poland	Latvia Poland	1997	2.97	3.20	3.05
Lithuania Poland	Lithuania Poland	1996	2.97	2.74	2.39
Protocol on Trade Negotiations (PTN)	Bangladesh; Brazil; Chile; Egypt; Israel; Korea, Republic of; Mexico; Pakistan; Paraguay; Peru; Philippines; Serbia; Tunisia; Turkey; Uruguay	1971	0.00	2.15	0.00
Israel Romania	Israel Romania	2001	2.35	2.15	2.39
Moldova Romania	Moldova Romania	1994	2.35	2.15	2.39
Romania Turkey	Romania Turkey	1997	2.97	2.15	2.39

Lome II	See Lome I	1979	0.00	2.15	3.05
Australia Singapore	Australia Singapore	2003	2.97	3.57	3.05
Estonia Slovakia	Estonia Slovakia	1996	2.97	2.74	3.05
Israel Slovakia	Israel Slovakia	1996	2.35	2.15	2.39
Latvia Slovakia	Latvia Slovakia	1996	2.97	3.20	3.05
Lithuania Slovakia	Lithuania Slovakia	1996	2.97	2.74	3.05
Romania Slovakia	Romania Slovakia	1994	2.97	2.74	3.05
Slovakia Slovenia	Slovakia Slovenia	1993	2.97	2.74	3.05
Slovakia Turkey	Slovakia Turkey	1997	2.35	2.15	2.39
Croatia Slovenia	Croatia Slovenia	1997	3.47	2.74	3.05
Estonia Slovenia	Estonia Slovenia	1996	2.97	3.20	3.58
Israel Slovenia	Israel Slovenia	1998	2.35	2.15	2.39
Latvia Slovenia	Latvia Slovenia	1996	3.47	3.20	3.05
Lithuania Slovenia	Lithuania Slovenia	1996	2.97	2.74	2.39
South Africa Southern Rhodesia Customs Union	Botswana; Eswatini; Lesotho; Na mibia; South Africa	1948	0.00	0.00	0.00
South Asian Free Trade Area (SAFTA)	Afghanistan; Bangladesh; Bhutan ; India; the Maldives; Nepal; Pakistan; Sri Lanka	2004	2.35	2.15	2.39
South Asian Association for Regional Cooperation, Preferential Trading Arrangement (SAPTA)	Bangladesh; Butan; India; Maldives; Nepal; Pakistan; Sri Lanka	1993	0.00	2.15	0.00

South Pacific Trade and Economic Co Operation Agreement (SPARTECA)	Australia; Cook Islands; Fiji; Kiribati; Marshall Islands; Micronesia; Nauru; New Zealand; Niue; Papua New Guinea; Samoa; Solomon Islands; Tonga; Tuvalu; Vanuatu	1980	2.35	2.74	2.39
Southern Africa Customs Union (SACU)	Botswana; Eswatini; Lesotho; Namibia; South Africa	2002	2.35	0.00	0.00
Southern African Development Community (SADC)	Angola; Botswana; Comoros; Democratic Republic of the Congo; Eswatini; Lesotho; Madagascar; Malawi; Mauritius; Mozambique; Namibia; Seychelles; South Africa; Tanzania; Zambia; Zimbabwe	1996	2.35	2.15	2.39
MERCOSUR	Brazil, Argentina, Uruguay, Parag uay; Venezuela	1991	3.47	4.38	2.39
China Switzerland	China Switzerland	2013	3.47	4.59	5.28
Australia Thailand	Australia Thailand	2004	2.35	3.20	2.39
New Zealand Thailand	New Zealand Thailand	2005	2.97	4.96	5.96
Lome III	See Lome I	1984	2.97	3.20	2.39
Trans Pacific Strategic EPA	Brunei; Chile; Singapore; New Zealand	2005	2.35	3.20	4.02
Transpacific Partnership (TPP)	Australia; Brunei; Canada; Chile; Japan; Malaysia; Mexico; New Zealand; Peru; Singapoe; Vietnam	2016	3.89	6.40	7.26
Commonwealth of Independent States (CIS)	Armenia; Azerbaijan; Belarus; Kazakhstan; Kyrgyzstan; Moldova' Russian Federation; Tajikistan; Uzbekistan	2011	2.35	2.15	2.39
Albania Turkey	Albania Turkey	2006	2.35	2.74	2.39

Chile Turkey	Chile Turkey	2009	2.35	3.88	4.72
Croatia Turkey	Croatia Turkey	2002	2.35	2.74	2.39
Estonia Turkey	Estonia Turkey	1997	2.35	2.15	2.39
Georgia Turkey	Georgia Turkey	2007	2.35	2.74	2.39
Israel Turkey	Israel Turkey	1996	0.00	0.00	2.39
Jordan Turkey	Jordan Turkey	2009	2.35	3.20	2.39
Latvia Turkey	Latvia Turkey	1998	2.35	2.15	2.39
Lithuania Turkey	Lithuania Turkey	1997	2.35	2.15	2.39
Mauritius Turkey	Mauritius Turkey	2011	0.00	2.15	0.00
Morocco Turkey	Morocco Turkey	2004	2.35	2.15	2.39
Poland Turkey	Poland Turkey	1999	2.35	2.15	2.39
Slovenia Turkey	Slovenia Turkey	1998	2.35	2.15	2.39
Tunisia Turkey	Tunisia Turkey	2004	2.35	2.74	2.39
Kazakhstan Ukraine	Kazakhstan Ukraine	1994	2.35	2.15	2.39
Moldova Ukraine	Moldova Ukraine	2003	2.97	3.20	3.05
Russia Ukraine	Russia Ukraine	1993	0.00	0.00	0.00
Tajikistan Ukraine	Tajikistan Ukraine	2001	2.35	2.15	2.39
Australia US	Australia US	2004	2.35	5.29	6.17
Bahrain US	Bahrain US	2004	2.97	6.00	6.55
Chile US	Chile US	2003	2.35	5.29	6.55
Colombia US	Colombia US	2006	2.35	5.59	6.55
Israel US	Israel US	1985	0.00	2.15	0.00
Jordan US	Jordan US	2000	2.35	3.88	4.72
Morocco US	Morocco US	2004	2.97	5.13	6.17
Oman US	Oman US	2006	2.35	5.29	6.36
Panama US	Panama US	2007	2.35	5.29	6.73
Peru US	Peru US	2006	2.35	5.29	6.36
Singapore US	Singapore US	2003	2.35	5.13	5.96
West African Economic and Monetary Union	Benin; Burkina Faso; Cape Verde; Ivory Coast; Gambia; Ghana; Guinea; Guinea-Bissau; Liberia;	1994	3.47	3.20	2.39

	Mali; Niger; Nigeria; Senegal; Sierra Leone; Togo				

Table B1.2: List of Countries and ISO_3 Codes

ABW	Aruba	KWT	Kuwait
AFG	Afghanistan	LAO	Lao People's Democratic Republic
AGO	Angola	LBR	Liberia
ALB	Albania	LCA	Saint Lucia
ARE	United Arab Emirates	LKA	Sri Lanka
ARG	Argentina	LSO	Lesotho
ARM	Armenia	LTU	Lithuania
ATG	Antigua and Barbuda	LUX	Luxembourg
AUS	Australia	LVA	Latvia
AUT	Austria	MAC	Macao
BDI	Burundi	MAR	Morocco
BEL	Belgium	MDA	Moldova, Republic of
BEN	Benin	MDG	Madagascar
BFA	Burkina Faso	MDV	Maldives
BGD	Bangladesh	MEX	Mexico
BGR	Bulgaria	MLI	Mali
BHR	Bahrain	MLT	Malta
BLZ	Belize	MMR	MMR Myanmar
BOL	Plurinational State of Bolivia	MNG	Mongolia
BRA	Brazil	MOZ	Mozambique
BRB	Barbados	MRT	Mauritania
BRN	Brunei Darussalam	MUS	Mauritius
BWA	Botswana	MWI	Malawi
CAF	Central African Republic	MYS	Malaysia
CAN	Canada	NAM	Namibia
CHE	Switzerland	NER	Niger
CHL	Chile	NGA	Nigeria
CHN	China	NIC	Nicaragua
CIV	Côte d'Ivoire	NLD	Netherlands
CMR	Cameroon	NOR	Norway
COG	Congo	NPL	Nepal
COL	Colombia	NZL	New Zealand
CPV	Cape Verde	OMN	Oman
CRI	Costa Rica	PAK	Pakistan
CUB	Cuba	PAN	Panama
CYP	Cyprus	PER	Peru
CZE	Czech Republic	PHL	Philippines
DEU	Germany	PNG	Papua New Guinea
DJI	Djibouti	POL	Poland
DMA	Dominica	PRT	Portugal
DNK	Denmark	PRY	Paraguay
DOM	Dominican Republic	QAT	Qatar

ECU	Ecuador	ROM	Romania
EGY	Egypt	RUS	Russian Federation
ESP	Spain	RWA	Rwanda
EST	Estonia	SAU	Saudi Arabia
FIN	Finland	SEN	Senegal
FJI	Fiji	SGP	Singapore
FRA	France	SLB	Solomon Islands
GAB	Gabon	SLE	Sierra Leone
GBR	United Kingdom	SLV	El Salvador
GEO	Georgia	SUR	Suriname
GHA	Ghana	SVK	Slovakia
GIN	Guinea	SVN	Slovenia
GMB	Gambia	SWE	Sweden
GNB	Guinea-Bissau	SWZ	Swaziland
GRC	Greece	SYC	Seychelles
GRD	Grenada	TCD	Chad
GTM	Guatemala	TGO	Togo
GUY	Guyana	THA	Thailand
HKG	Hong Kong	TJK	Tajikistan
HND	Honduras	TON	Tonga
HRV	Croatia	TTO	Trinidad and Tobago
HTI	Haiti	TUN	Tunisia
HUN	Hungary	TUR	Turkey
IDN	Indonesia	TZA	Tanzania, United Republic of
IND	India	UGA	Uganda
IRL	Ireland	UKR	Ukraine
ISL	Iceland	URY	Uruguay
ISR	Israel	USA	United States
ITA	Italy	VCT	Saint Vincent and the Grenadines
JAM	Jamaica	VEN	Venezuela, Bolivarian Republic of
JOR	Jordan	VNM	Viet Nam
JPN	Japan	VUT	Vanuatu
KAZ	Kazakhstan	WSM	Samoa
KEN	Kenya	YEM	Yemen
KGZ	Kyrgyzstan	ZAF	South Africa
KHM	Cambodia	ZAR	Democratic Republic of Congo
KNA	Saint Kitts and Nevis	ZMB	Zambia
KOR	Korea, Republic of	ZWE	Zimbabwe

Appendix B2. Non-Trade Issue Index. Descriptive Stats.

Table B2.1: Non-Trade Issue Index Correlation with Trade

	Trade	ESR	EP	CPR
Trade	**1.0000**			
ESR	**0.1091**	**1.0000**		
EP	**0.0838**	**0.9225**	**1.0000**	
CPR	**0.0780**	**0.9029**	**0.9516**	**1.0000**

Table B2.2: Non-Trade Issue Variable Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ESR	1,170,240	0.7371564	1.547276	0	6.400174
EP	1,170,240	0.6264086	1.531799	0	7.088878
CPR	1,170,240	.6073572	1.514194	0	5.810403

Figure B2.1: Inclusion of CPR NTIs in PTAs (%)

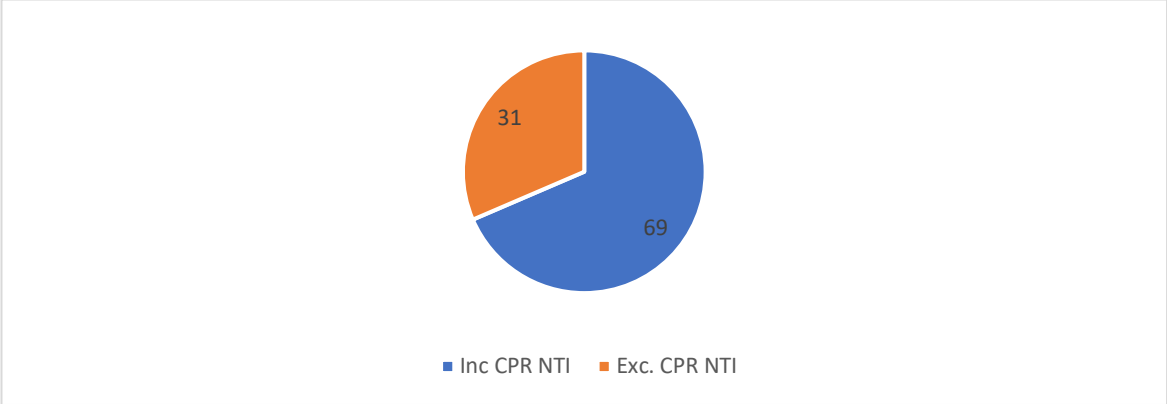


Figure B2.2: Inclusion of ESR NTIs in PTAs (%)

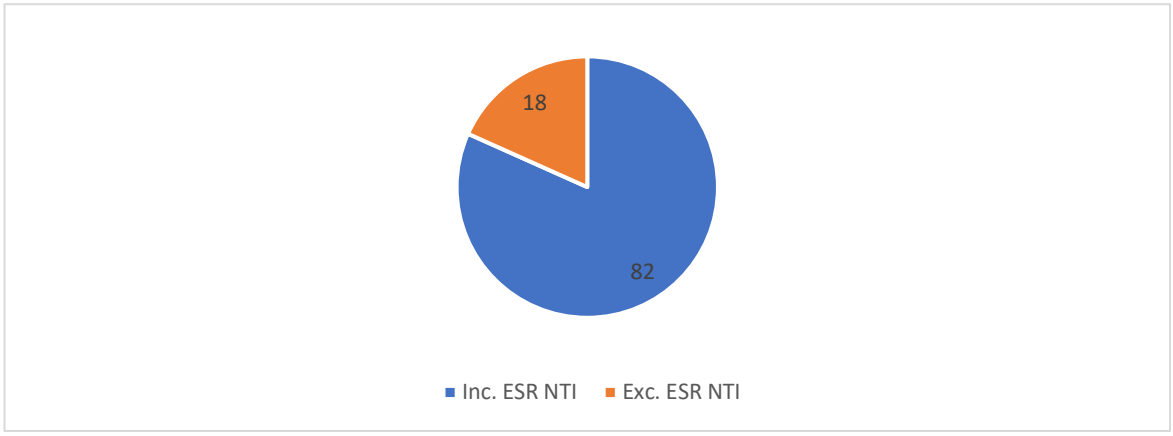
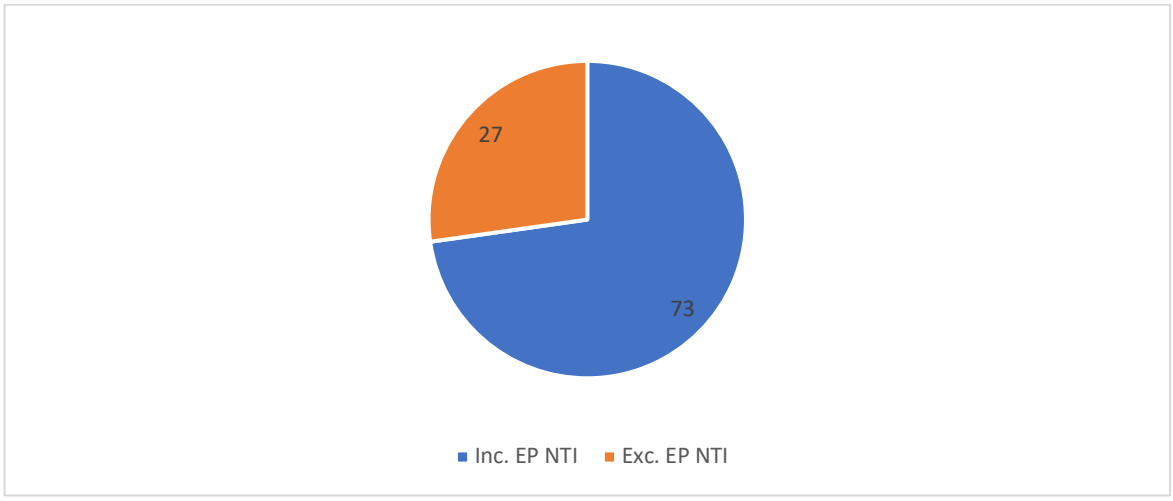


Figure B2.3: Inclusion of EP NTIs in PTAs (%)



Appendix C. Chapter 3.

Appendix C1. List of Preferential Trade Agreements

Table C1.1: List of Preferential Trade Agreements

PTA Name	Year of Entry into Force	Signatory Nations
ASEAN – Australia – New Zealand	2010	Australia; Brunei Darussalam; Myanmar; Cambodia; Indonesia; Lao People's Democratic Republic; Malaysia; Philippines; Singapore; Viet Nam; Thailand; New Zealand
ASEAN - China	2005	Brunei Darussalam; China; Myanmar; Cambodia; Indonesia; Lao People's Democratic Republic; Malaysia; Philippines; Singapore; Viet Nam; Thailand
ASEAN - India	2010	Brunei Darussalam; Myanmar; Cambodia; Indonesia; India; Lao People's Democratic Republic; Malaysia; Philippines; Singapore; Viet Nam; Thailand
ASEAN - Japan	2008	Brunei Darussalam; Myanmar; Cambodia; Indonesia; Japan; Lao People's Democratic Republic; Malaysia; Philippines; Singapore; Viet Nam; Thailand
ASEAN - Korea	2010	Brunei Darussalam; Myanmar; Cambodia; Korea, Republic of; Indonesia; Lao People's Democratic Republic; Malaysia; Philippines; Singapore; Viet Nam; Thailand
Association of Southeast Asian Nations (ASEAN) FTA	1992	Brunei Darussalam; Myanmar; Cambodia; Indonesia; Lao People's Democratic Republic; Malaysia; Philippines; Singapore; Viet Nam; Thailand
Asia Pacific Trade Agreement (APTA)	1976	Bangladesh; China; India; Korea, Republic of; Lao People's Democratic Republic; Sri Lanka
Brunei Darussalam – Japan	2008	Brunei Darussalam; Japan
China – Singapore	2009	China; Singapore
EFTA – Singapore	2003	Iceland; Liechtenstein; Norway; Switzerland; Singapore
Developing-Eight (D8)	2006	Bangladesh; Indonesia; Iran; Egypt; Malaysia; Pakistan; Turkey; Nigeria

Global System of Trade Preferences among Developing Countries (GSTP)	1989	Algeria; Argentina; Bangladesh; Benin; Bolivia, Plurinational State of; Brazil; Cameroon; Chile; Colombia; Cuba; Ecuador; Egypt; Ghana; Guinea; Guyana; India; Indonesia; Iran; Iraq; Korea, Democratic People's Republic of; Korea, Republic of; Libya; Malaysia; Mexico; Morocco; Mozambique; Myanmar; Nicaragua; Nigeria; Pakistan; Peru; Philippines; Singapore; Sri Lanka; Sudan; Tanzania; Thailand; Trinidad and Tobago; Tunisia; Venezuela, Bolivarian Republic of; Viet Nam; Zimbabwe
Gulf Cooperation Council (GCC) - Singapore	2008	Bahrain, Kingdom of; Kuwait, the State of; Oman; Qatar; Saudi Arabia, Kingdom of; United Arab Emirates; Singapore
India - Malaysia	2011	India; Malaysia
India - Singapore	2005	India; Singapore
Japan - Indonesia	2008	Indonesia; Japan
Japan - Malaysia	2006	Japan; Malaysia
Japan - Philippines	2008	Japan; Philippines
Japan - Singapore	2002	Japan; Singapore
Japan - Thailand	2007	Japan; Thailand
Japan - Viet Nam	2009	Japan; Vietnam
Jordan - Singapore	2005	Jordan; Singapore
Korea- Singapore	2006	Korea, Republic of; Singapore
Lao People's Democratic Republic - Thailand	1991	Lao People's Democratic Republic; Thailand
New Zealand – Malaysia	2010	Malaysia; New Zealand
New Zealand – Singapore	2001	Singapore; New Zealand
Pakistan – Malaysia	2008	Malaysia; Pakistan
Panama - Singapore	2006	Panama; Singapore
Peru – Singapore	2009	Peru; Singapore
Peru - Thailand	2005	Peru; Thailand

Protocol on Trade Negotiations (PTN)	1973	Bangladesh; Brazil; Chile; Egypt; Israel; Korea, Republic of; Mexico; Pakistan; Paraguay; Peru; Philippines; Serbia; Tunisia; Turkey; Uruguay
Singapore - Australia	2003	Australia; Singapore
Thailand - Australia	2005	Australia; Thailand
Thailand - New Zealand	2005	Thailand; New Zealand
Trans-Pacific Strategic Economic Partnership	2006	Brunei Darussalam; Chile; New Zealand; Singapore
US - Singapore	2004	Singapore; United States of America
US - Vietnam	2000	United States of America; Vietnam

Table C1.2: List of Countries and ISO_3 Codes

AIA	Anguilla	LKA	Sri Lanka
ARE	United Arab Emirates	LTU	Lithuania
ARG	Argentina	LUX	Luxembourg
AUS	Australia	LVA	Latvia
AUT	Austria	MAC	Macao
BEL	Belgium	MAR	Morocco
BGD	Bangladesh	MEX	Mexico
BGR	Bulgaria	MLT	Malta
BHS	Bahamas	MMR	Myanmar
BMU	Bermuda	MOZ	Mozambique
BRA	Brazil	MRT	Mauritania
BRN	Brunei Darussalam	MUS	Mauritius
CAN	Canada	MWI	Malawi
CHE	Switzerland	MYS	Malaysia
CHL	Chile	NGA	Nigeria
CHN	China	NLD	Netherlands
COK	Cook Islands	NOR	Norway
CRI	Costa Rica	NRU	Nauru
CYM	Cayman Islands	NZL	New Zealand
CYP	Cyprus	OMN	Oman
CZE	Czech Republic	PAK	Pakistan
DEU	Germany	PAN	Panama
DNK	Denmark	PER	Peru
ECU	Ecuador	PHL	Philippines
EGY	Egypt	POL	Poland
ESP	Spain	PRT	Portugal
EST	Estonia	QAT	Qatar
FIN	Finland	ROM	Romania
FRA	France	RUS	Russian Federation
GBR	United Kingdoms	SAU	Saudi Arabia
GHA	Ghana	SGP	Singapore
GIB	Gibraltar	SLV	El Salvador
GRC	Greece	SVK	Slovakia

HKG	Hong Kong	SVN	Slovenia
HUN	Hungary	SWE	Sweden
IDN	Indonesia	SYC	Seychelles
IND	India	THA	Thailand
IRL	Ireland	TTO	Trinidad and Tobago
IRN	Iran, Islamic Republic of	TUN	Tunisia
ISL	Iceland	TUR	Turkey
ISR	Israel	TWN	Taiwan, Province of Japan
ITA	Italy	TZA	Tanzania, United Republic of
JOR	Jordan	UGA	Uganda
JPN	Japan	UKR	Ukraine
KAZ	Kazakhstan	USA	United States
KGZ	Kyrgyzstan	UZB	Uzbekistan
KHM	Cambodia	VEN	Venezuela, Bolivarian Republic of
KOR	Korea, Republic of	VGB	British Virgin Islands
KWT	Kuwait	VNM	Vietnam
LAO	Lao People's Democratic Republic	WSM	Samoa
LBN	Lebanon	ZAF	South Africa
LBR	Liberia	ZMB	Zambia

Appendix C2. Trade Facilitation Index. Content, Scores, and Characteristics[107]

Table C2.1: Trade Facilitation Index Conditions

GATT Article X. Transparency [8]	
Publication & Availability of Information	Obligation to Consult Traders/Business
Internet Publication	Commenting on Proposed Regulations
Enquiry Points	Advance Rulings
Publication Prior to Implementation	Appeals
GATT Article VIII. Fees and Formalities [19]	
Fees and Charges Connected with Import/Export	Consularization
Co-operation on Customs and Other TF matters	Penalty Disciplines
Pre-arrival Processing	Simplification of Formalities/Procedures
Automation/Electronic Submission	Harmonization of Regulations/Formalities
Separation of Release from Clearance	Use of International Standards
Risk Management	Single Window
Post Clearance Audit	Pre-Shipment Inspections
Release Times	Customs Brokers
Authorized Operators	Temporary Admission of Goods
Expedited Shipments	
GATT Article. V. Freedom of transit for goods [1]	
Freedom of Transit for Goods	

[107] From Neufeld (2014)

Table C2.2: GATT Article X. Transparency and GATT Article V. Freedom of Transit of Goods Scores

PTA Name	Date of entry into force	Publication & Availability of Info	Internet Publication	Enquiry points	Publication prior to Implementation	Obligation to consult traders/business	Commenting on proposed regulations	Advance Rulings	Appeals	Gatt Art X. Index	GATT ART. V
ASEAN - Australia - New Zealand	2010	1	1	1	1	0	0	1	1	6	0
ASEAN - China	2005	1	0	0	1	0	0	0	0	2	0
ASEAN - India	2010	1	0	0	1	0	0	0	0	2	0
ASEAN - Japan	2008	1	1	0	0	0	0	0	0	2	0
ASEAN – Korea	2010	1	0	0	1	0	0	0	1	3	0
ASEAN Free Trade Area	1993	1	1	1	0	1	0	1	1	6	0
Asia Pacific Trade Agreement (APTA)	1976	1	0	0	0	0	1	1	1	4	0
Brunei Darussalam – Japan	2008	1	0	0	1	0	0	1	1	4	0
China – Singapore	2009	1	1	1	0	0	0	1	1	5	0
EFTA – Singapore	2003	1	0	0	0	0	0	0	0	1	0
India - Malaysia	2011	1	1	1	1	0	1	1	1	7	1
India - Singapore	2005	1	0	0	0	0	0	1	0	2	0
Japan - Indonesia	2008	1	0	0	1	0	0	0	1	3	0
Japan - Malaysia	2006	1	0	1	1	0	1	1	1	6	1
Japan - Philippines	2008	1	0	0	1	0	1	0	1	4	1
Japan - Singapore	2002	1	0	0	0	0	0	0	0	1	1
Japan - Thailand	2007	1	0	0	1	0	1	0	1	4	1
Japan - Viet Nam	2009	1	0	0	1	0	1	0	1	4	1
Jordan - Singapore	2005	1	0	0	0	0	0	1	0	2	0
Korea- Singapore	2006	1	1	1	1	0	1	1	1	7	1

Lao People's Democratic Republic - Thailand	1991	0	0	0	0	0	0	0	0	0	0
New Zealand – Malaysia	2010	1	1	1	0	0	0	1	1	5	0
New Zealand – Singapore	2001	1	0	0	0	0	1	0	0	2	0
Pakistan – Malaysia	2008	1	1	1	0	0	0	0	1	4	0
Panama - Singapore	2006	1	1	1	0	0	0	1	1	5	0
Peru – Singapore	2009	1	1	1	1	0	0	1	1	6	1
Singapore - Australia	2003	0	0	0	0	0	0	0	0	0	0
Thailand - Australia	2005	1	1	1	1	0	1	1	1	7	0
Thailand - New Zealand	2005	1	1	1	1	0	1	1	1	7	0
Trans-Pacific Strategic Economic Partnership	2006	1	1	1	1	0	1	1	1	7	0
US - Singapore	2004	1	1	1	1	0	1	1	1	7	0

Table C2.3: GATT Article VIII. Fees and Formalities [Conditions 1 -10]

PTA Name	Date of entry into force	Fees & charges connected w import/export	Penalty disciplines	Pre-arrival processing	Automation/electronic submission	Separation of release from clearance	Risk management	Post Clearance Audits	Release times	Authorized operators	Expedited Shipments
ASEAN - Australia - New Zealand	2010	1	0	0	1	0	1	0	0	0	1
ASEAN - China	2005	0	0	0	0	0	0	0	0	0	0
ASEAN - India	2010	0	0	0	0	0	0	0	0	0	0
ASEAN - Japan	2008	0	0	0	0	0	0	0	0	0	0
ASEAN – Korea	2010	0	0	0	0	0	1	0	0	0	0
ASEAN Free Trade Area	1993	1	0	1	1	0	1	1	0	1	1
Asia Pacific Trade Agreement (APTA)	1976	1	0	1	1	0	1	0	0	0	0
Brunei Darussalam – Japan	2008	0	0	0	1	0	0	0	0	0	0
China – Singapore	2009	0	0	0	0	0	1	0	0	0	0
EFTA – Singapore	2003	0	0	0	0	0	0	0	0	0	0
India - Malaysia	2011	1	0	1	1	0	1	0	1	0	0
India - Singapore	2005	0	0	0	1	0	1	0	0	0	0
Japan - Indonesia	2008	0	0	0	1	0	1	0	0	0	0
Japan - Malaysia	2006	0	0	0	1	0	1	0	0	0	0

Japan - Philippines	2008	0	0	0	1	0	1	0	0	0	0
Japan - Singapore	2002	0	0	0	1	0	0	0	0	0	0
Japan - Thailand	2007	0	0	0	1	0	1	0	0	0	0
Japan - Viet Nam	2009	0	0	0	1	0	1	0	0	0	0
Jordan - Singapore	2005	0	0	0	0	0	0	0	0	0	0
Korea-Singapore	2006	1	0	0	1	0	1	0	0	0	0
Lao People's Democratic Republic - Thailand	1991	0	0	0	0	0	0	0	0	0	0
New Zealand – Malaysia	2010	0	0	0	1	0	1	0	1	0	1
New Zealand – Singapore	2001	1	0	0	1	0	1	0	0	0	0
Pakistan – Malaysia	2008	0	0	0	1	0	1	0	0	0	0
Panama - Singapore	2006	1	0	0	1	0	1	0	0	0	0
Peru – Singapore	2009	1	0	1	1	0	1	0	1	0	1
Singapore - Australia	2003	0	0	0	0	0	1	0	0	0	0
Thailand - Australia	2005	1	0	0	1	0	1	0	0	0	0
Thailand - New Zealand	2005	1	0	0	1	0	1	0	0	0	0
Trans-Pacific Strategic Economic Partnership	2006	1	1	1	1	0	1	0	1	0	1

US - Singapore	2004	1	1	1	1	1	1	0	1	0	1

Table C2.4: GATT Article VIII. Fees and Formalities [Conditions 11 -19 and Index]

PTA Name	Date of entry into force	Consularization	Co-operation on custom & other TF matters	Simplification of formalities/procedures	Harmonization of regulations/formalities	Use of international standards	Single Window	Pre-shipment inspections	Customs brokers	Temporary admission of goods	GATT Art. VIII. Index
ASEAN - Australia - New Zealand	2010	1	1	1	0	1	1	0	0	0	9
ASEAN - China	2005	0	1	0	0	0	0	0	0	0	1
ASEAN - India	2010	0	0	1	1	1	0	0	0	0	3
ASEAN - Japan	2008	0	1	1	1	1	0	0	0	0	4
ASEAN – Korea	2010	0	1	1	0	0	0	0	0	0	3
ASEAN Free Trade Area	1993	0	1	1	1	1	1	0	0	1	13
Asia Pacific Trade Agreement (APTA)	1976	0	1	1	1	1	1	0	0	0	9
Brunei Darussalam – Japan	2008	0	1	1	1	1	0	0	0	0	5
China – Singapore	2009	0	0	0	0	0	0	0	0	0	1
EFTA – Singapore	2003	0	0	0	0	0	0	0	0	0	0
India - Malaysia	2011	0	1	1	1	1	0	0	1	1	11
India - Singapore	2005	0	1	1	0	0	0	0	0	1	5
Japan - Indonesia	2008	0	1	1	1	1	0	0	0	0	6
Japan - Malaysia	2006	0	1	1	1	0	0	0	0	1	6
Japan - Philippines	2008	0	1	1	1	0	0	0	0	0	5
Japan - Singapore	2002	0	1	1	0	1	0	0	0	1	5
Japan - Thailand	2007	0	1	1	1	0	0	0	0	1	6
Japan - Viet Nam	2009	0	1	1	1	1	0	0	0	0	6
Jordan - Singapore	2005	0	1	0	0	0	0	0	0	0	1
Korea- Singapore	2006	0	1	1	0	0	0	0	0	1	6

Lao People's Democratic Republic - Thailand	1991	0	0	0	0	0	0	0	0	0	0
New Zealand – Malaysia	2010	0	1	1	0	1	0	0	0	0	7
New Zealand – Singapore	2001	0	1	1	0	1	0	0	0	0	6
Pakistan – Malaysia	2008	0	1	1	1	1	0	0	0	1	7
Panama - Singapore	2006	0	1	1	0	1	0	0	0	1	7
Peru – Singapore	2009	1	1	1	0	0	0	0	0	1	10
Singapore - Australia	2003	0	0	1	0	1	0	0	0	0	3
Thailand - Australia	2005	0	1	1	1	1	0	0	0	0	7
Thailand - New Zealand	2005	0	1	1	1	1	0	0	0	0	7
Trans-Pacific Strategic Economic Partnership	2006	1	1	1	1	1	0	0	0	1	13
US - Singapore	2004	0	1	1	0	0	0	0	0	1	11

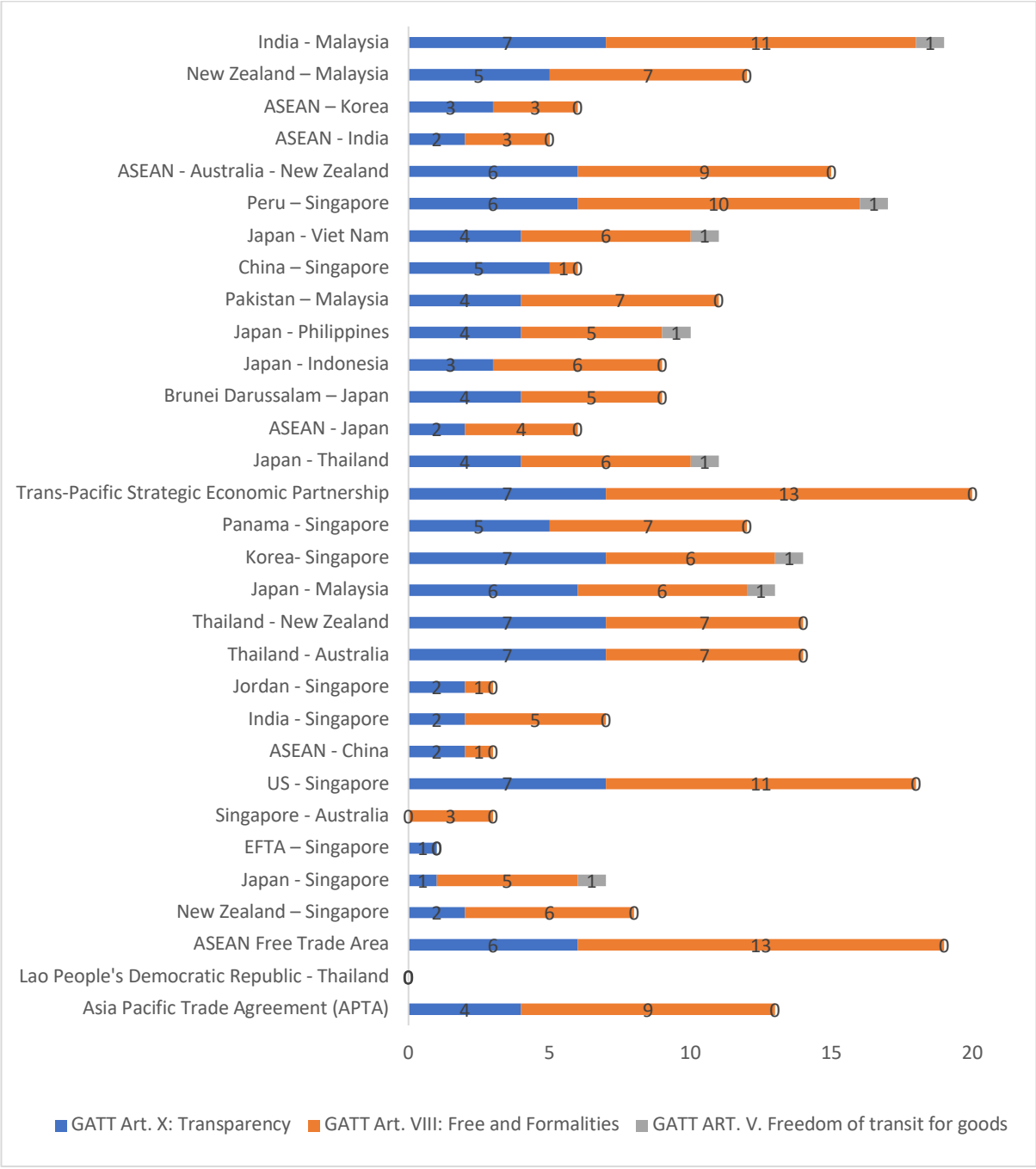
Table C2.5: Trade Facilitation Index Correlation with FDI

	FDI	GATT. Art X	GATT. Art VIII	GATT. Art VIII
FDI	**1.0000**			
GATT. Art X	**0.1586**	**1.0000**		
GATT. Art VIII	**0.1295**	**0.9808**	**1.0000**	
GATT. Art VIII	**0.0854**	**0.1376**	**0.0966**	**1.0000**

Table C2.6: Trade Facilitation Index and Dummy Summary Statistics

Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
GATTArtX Index	23,640	0.3933587	1.428961	0	7
GATTArt8 Index	23,640	0.7662437	2.910718	0	13
GATTArtV	23,640	0.0023689	0.0486143	0	1
GATTArtX Dummy	23,640	0.0795262	0.270564	0	1
GATTArt8 Dummy	23,640	0.0775804	0.2675158	0	1

Figure C2.1: Visualisation of PTA Trade Facilitation Conditions.



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