New Preferential Trade Agreements: Enhancing or Disrupting Trade?

Influence of PTA Depth on Trade

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Abstract. There exist more preferential trade agreements than ever before. Since the breakdown of negotiations of the WTO development rounds PTAs have proliferated, partly to pick up where the negotiations have left off, albeit in smaller circles. For these reasons, preferential trade agreements have not only increased in frequency but also in complexity and depth. I investigate the impact of preferential trade agreement depth on international trade flows. To characterize depth, I use information on the existence of certain clauses present in a PTA for a variety of different trade agreements. The results indicate that vertical depth defined by commitment strength and agreement rules does not increase trade volumes further. Non-tariff provisions that aim to enhance social welfare, such as environmental and labor market clauses, have a negative effect on trade flows. For other regulatory provisions, no such effect is identified. The findings are supported by country-dyad level data on 283 trade agreements and their provisional content for the time period of 1990 to 2017.

1. INTRODUCTION

The current landscape of international relations and trade is increasingly characterized by regional cooperation. Once great political and economic unifying forces like the UN and the WTO are progressively losing their relative importance next to important regional developments in the domain of politics, security and also trade. The Regional Comprehensive Economic Partnership (RCEP) agreement, for example, is set to become the largest regional trade agreement as measured by the share of global GDP, which will create a "new centre of gravity" for global trade (UNCTAD 2021). In place of an overarching multilateral framework, sovereign states are more likely to seek trade cooperation within regional frameworks which are set to substitute away the institutions of the post-war order (Bobowski 2018). What explains their success, and how might they change the economic and political landscape? One answer seems to be that PTAs are no longer the about elimination of trade-barriers, but about international cooperation and governance, about supra-national challenges and opportunities.

Research thus far has been focused on the impact of PTA formation and membership on trading countries and their trade flows. However, with the increased sophistication and diversification of trade agreements, their innate design might offer a better picture of how exactly they influence trade. Thanks to newly available datasets on the provisional content of PTAs, their perception has changed from being monolithic agents of tariff reduction, to vessels containing a broad range of regulations and policy areas. It has been well known for decades that PTA membership increases the amount of trade between nations. However, new advances in descriptive PTA studies allow us to study what the individual elements of PTAs are and how their design might impact countries on a more specific level. For this reason, I attempt to analyze the characteristics of PTAs and to what extent those characteristics impact international trade. Even though PTAs are no longer just about trade, trade itself is the primal motivator for trade agreements. To explore their effects on other socio-economic issues, one must first make a tangible connection between their design and trade. To this end, this paper explores PTA *depth* as characteristics relating to the strength of their commitment, and the number of policy areas covered. The research question is formulated as follows:

How does agreement depth affect bilateral trade volumes in preferential trade agreements?

By answering this question, this paper gives new insight into the characteristics and the design of PTAs. Insights from questions like these are important, when we want to know what policymakers are getting into when they sign new PTAs. This paper attempts to disentangle the proverbial "spaghetti bowl of trade" (Bhagwati 1995) and shed light on how PTAs differ from their not-so-distant GATT cousin. Motivated by the missing link between trade and PTA depth, I provide an overview of the relevant literature in order to then proceed with my theoretical framework. Next, I continue with my methodology and present the empirical results. Lastly, I conclude with the limitations and the implications of the findings.

2. LITERATURE REVIEW

2.1 Theories of International Trade

The first theory on international trade can be traced all the way back to the *opus magnus* of Adam Smith, "The Wealth of Nations" (1776). Besides his contributions to the theory of the free market, Smith countered the logic of mercantilist ideals by stating that the export of nation A must by nature be imported by some other nation B, and therefore all countries would benefit from free trade in line with their absolute advantage (Smith 1776). This theory was further developed by David Ricardo in 1817, when he introduced his concept of comparative advantage, stating that even in the absence of absolute advantage, a generally less efficient country can gain from mutual trade, should its relative efficiency of producing two goods be different from another country (Ricardo 1817). The basic notion of absolute and comparative advantage is the foundation upon which PTAs are built, and it will be essential to explain the mechanism behind my theory.

2.2 The Proliferation of PTAs

Since the breakdown of the Doha Negotiation Round in Geneva 13 years ago, it has become increasingly evident that the negotiations have stalled for the foreseeable future. In its place, preferential trade agreements have continued to proliferate rapidly. Nowadays, all major and regional economies are involved in some kind of PTA negotiation. Studies have shown that the recent wave of PTAs indeed goes further in liberalization commitments in services than the GATS treaty borne from the

WTO. Roy et al. (2007) provide evidence that numerous PTAs contain commitments in sectors that had not been an issue area in the GATS (Roy, Marchetti, and Lim 2007). While earlier trade literature has focused on explaining this new wave of PTAs, the emphasis in the last decade has shifted away from formation to trade effects of PTA's (Dür, Baccini, and Elsig 2014).

Scholars have emphasized repeatedly that in addition to potential trade diverting effects, PTA's represent the antithesis to the spirit of non-discriminatory trade liberalization in the WTO because PTA members are unwilling to make tariff cuts vis-a-vis non-members, since they might lead to the erosion of the trade preferences they have granted their partners (Bhagwati 2002; Krishna 1998; Limão 2005). If preferential trade really is the new way forward in trade policy and accordingly international political economy, researchers must shift their focus even more on PTAs and their characteristics than in the past.

2.3 The Effect of PTAs on Trade Flows

The main goal of trade agreements is to reduce or eliminate trade barriers. It is known from the two country-model that in general, reducing tariffs increases total welfare[1]. Trade agreements *create*, and at the same time *divert* trade flows. These terms were first coined by Jacob Viner in the 1950's, where he discusses the welfare effects of free trade agreements. Universal tariffs with the rest of the world would lead a country to trade with the most efficient nation. Reciprocal tariff reductions with the most efficient nation might lead to further trade increases. However, agreements with a less-efficient nation can lead to trade diversion due to the higher cost of production (Viner 1950).

The primary theoretical effect of PTAs in the scientific literature is exclusively derived from the estimations of various gravity models. PTAs in the gravity model represent reductions in trade costs, which is why they always increase trade flows, regardless of the underlying economic structure. There is a broad consensus in the literature that PTA's generally increase trade by a substantial margin, even with different model specifications (Anderson and Van Wincoop 2003; Baier and Bergstrand 2007; Egger et al. 2011; Eicher and Henn 2011; McCallum 1995). However, it is evident from the literature that at least empirically speaking, PTA effects on trade are not homogenous. For example,

[1] Tariff reduction leads to a net positive welfare gain, where consumer surplus outweighs and dead-weight gain outweighs the losses to domestic producers.

they are greater for agreements that are strongly tariff-reducing than agreements that have less tariff provisions (Eicher and Henn 2011). Limão reaffirms that overall PTA trade effects are stronger for deeper agreements (Limão 2016). While these scholars were able to establish a first link between PTA characteristics and trade, this link has not been studied exhaustively at all. Eicher and Henn (2011) for example, merely suggest a one-dimensional model of PTAs distinguishing between tariff-reducing and non-tariff characteristics of PTAs. While this bird-view on PTAs might have indeed been adequate to analyze PTA effects a decade ago, they are not sufficient for further analysis of trade effects in today's context. Scholars have noted a steady increase in policy areas covered, with numbers ranging from a few handful to 52 policy areas, depending on the definition (Mattoo, Rocha, and Ruta 2020). Another point of contention is the rather lax use of the term "depth", which is not clearly delineated in some articles. Is depth related to the strength of commitments or the covered number of policy areas? It seems to be the case that the definition of depth is only concerned with the latter (Dür, Baccini, and Elsig 2014), while ignoring the depth of an agreement within a certain provision. Given that the newer PTAs are ever-expanding in this so-called "depth", overhauling how we quantify and measure PTAs is a crucial task for every researcher that is serious about international trade and political economy.

2.4 Preferential Trade Agreement Depth

The majority of trade policy research so far has treated PTAs as a binary variable, indicating whether a country is either a member or a non-member to such a treaty. While treaty ratification and subsequent PTA membership itself is no doubt the strongest indicator signalling commitment through binding obligations, the actual strength and the extent of the legal obligations have largely been neglected so far (Koo, Kennedy, and Skripnitchenko 2006; Medvedev 2010; Panagariya 2000). This is to some extent due to the lack of quality data that has been unavailable until recently. Furthermore, while the impact of PTA membership on international trade has been cut and clear in the domain of economics, there has been little discussion about the theoretical implications of Preferential Trade agreement depth on trade. I am emphasizing theoretical, because the pure economics literature, on the other hand, is inundated with formal-theoretical approaches to trade research with equilibrium equations. While the recent breakthroughs in structural gravity models are certainly paving the way for

future trade research, they are not sufficient on their own to analyze the depth and design of preferential trade agreements (Anderson and Van Wincoop 2003; Egger and Larch 2008). Two-country models and general equilibrium equations are not able to fully grasp fundamental characteristics inside the PTA black box, because those characteristics are rooted in legal treatise and documents which are qualitative by nature. It is not surprising then, that in 2019 Baccini has outlined a few guidelines for PTA research to do exactly that: Urging scholars to look beyond mere agreement strength and to assess the interplay between strength, flexibility and provisions (Baccini 2019). Therefore, this paper does not concern itself very much with further estimation of PTA trade effects in general, but rather the identification and measurement of PTA depth in preferential trade agreements.

2.5 Qualitative PTA Datasets

Two important literary sources on PTA depth come from two articles that have presented their own datasets on the characteristics of PTAs. The article on the first of the two datasets, DESTA[2] for example, emphasizes the important differences between PTA provisions, and that those differences stem their various goals that are not always aligned with the free trade mantra of tariff elimination (Dür, Baccini, and Elsig 2014). As such, the researchers assert that PTA provisions by nature have intrinsically different barrier elimination properties. Trade in goods relies on services. Thus, provisions in services will also affect the trade on goods. Dür et al. (2014) also note that public procurement policies might lead to competition between exporters, which then should increase trade in goods and services. Other provisions concern investment that allow member countries to attract additional foreign direct investments. All these examples show that the design of an agreement matters for PTA trade effects. However, the direction of the effect of PTA "depth" on trade has been inconclusive so far. Empirical studies have shown that PTA provisions in non-tariff policy areas actually lead to increased trade costs due to the imposition of specific regulatory standards which are not easy to adhere to for producers (Arita, Mitchell, and Beckman 2015; Ing and Cadot 2017). These findings have been shown to hold true for specific goods sectors, like agriculture, and also specific trade agreements, like the

[2] The DESTA research project collects systematic data on the design of preferential trade agreements that have been signed since 1945.

ASEAN[3]. On the other hand Chen and Mattoo found on disaggregated data that agreements that emphasize harmonization and mutual recognition of product standards are positively associated with trade between members (Chen and Mattoo 2008). The researchers conclude by stating that "deeper" PTAs (encompassing more policy areas) have a stronger impact on trade. On a similar note, another article has shown that provisions that have no direct connection to tariff reduction also have a positive impact on trade (Dür, Baccini, and Elsig 2014). The heterogeneous findings tell us that the final word has not yet been spoken on the effects of PTAs on trade. A more rigorous evaluation of PTA characteristics is needed to account for their variation in trade effects across the literature.

A more recent dataset called Deep Trade Agreements[4] (DTA) documents the evolution of PTAs into "deep" trade agreements. The article claims that PTAs nowadays are more about regulatory measures than they are about tariffs. They do not only create market access, but in addition establish broader integration frameworks on integration in the domain of goods, services and factors, which indirectly regulates import and export sectors through a multilateral treaty (Mattoo, Rocha, and Ruta 2020). No longer are PTAs strictly trade eliminating, but maybe for the first time, imposing regulations and potentially introducing new barriers. The new era of PTAs is defined by the amalgamation of heterogeneous legal provisions of which their effects are still not entirely researched. The researchers state that the concept of PTA is moving away from "the administration of protection", namely quotas, tariffs and subsidies and toward an "administration of precaution", which includes security, safety, health and environmental sustainability (Mattoo, Rocha, and Ruta 2020).

2.6 PTAs as Policy Instruments?

The shift from the administration of *protection* to an administration of *precaution* as stated by Mattoo et al. (2020) can also paint PTAs in a different light. Recognizing the risks of liberalization of trade, trade agreements can be viewed as vehicles for improved environmental governance (McCarthy 2004). As the name implies however, governance always implies some sort of regulation of the markets,

[3] Association of Southeast Asian Nations

[4] The DTA dataset presents detailed information on the content of the policy areas most frequently covered in DTAs, focusing on the stated objectives, substantive commitments, and other aspects such as transparency, procedures, and enforcement.

which could impose limits on what exporters and importers might do. Similarly, labor standards are pushed onto new trade agreement signatories by the US and the EU. The US especially is serious in enforcing its labor standards in trade agreements through the use of sanctions, which implies that compliance would be an issue on those agreements (Postnikov and Bastiaens 2014). This tells us that co-signatories might not always be happy about those sorts of regulations, presumably due to frictional adjustment costs, which in turn leads to an increase in production costs. Environmental and labor standards are only two examples of the potential use of PTAs as instruments of foreign policy. When trade agreements stop being uniquely about tariff reduction and trade liberalization, there can be unintended consequences for their core performance metric: The amount of trade.

The recent literature is keen on getting the point across: PTAs are no longer what they used to be. They are evolving and are likely to play an ever-more important role in globalization. Like Baccini, who rightly challenges the status quo of PTA research, the World Bank article states that the quantification of PTA depth is a considerable obstacle that must be addressed by subsequent research (Mattoo, Rocha, and Ruta 2020). Therefore, this paper investigates how PTA depth, and more specifically, their provision characteristics might have a broader impact on trade in general.

3. THEORETICAL FRAMEWORK & HYPOTHESES

3.1 Assumptions and Delimitations

Before I proceed with my theory and mechanisms, it is important to state the assumptions and delimitations of this paper. Firstly, the term preferential trade agreement (PTA) stands for various things in different contexts. In this paper, PTA signifies a reciprocal agreement between two or more sovereign countries with the aim of reducing or eliminating trade barriers on a preferential basis. This definition excludes the General Agreement on Trade and Tariffs, as embodied by the WTO but includes free trade agreements (FTA) as a subset of PTAs. Furthermore, PTAs are not only limited to tariff reduction provisions, but may include other non-tariff provisions such as trade cooperation, facilitation, or standard-setting provisions. This definition is in line with classifications of trade agreements as expressed by the International Trade Centre and encompasses a broad range of different agreements, which are all covered in the previously mentioned datasets on PTAs (ITC 2020).

Secondly, this paper makes the assumption that PTAs do not lead to a net-decrease in trade volume between countries. The consensus in the literature is that PTAs generally speaking, significantly increase trade between nations (Anderson and Van Wincoop 2003; Baier and Bergstrand 2007; Egger et al. 2011; Hannan 2016; McCallum 1995). This was true, even when endogenous PTA membership was not accounted for, which underestimated the effect of PTAs on trade. At most, some studies have shown that trade agreements might have no effect on trade (Kohl 2014), but a negative trade effect has yet to be found among the works in the published literature. This assumption allows me to be more parsimonious with the theory and to focus on the core subject: PTA depth.

Concerning this term, "depth" needs to be clearly delimited, given the fact that there has been no consensus yet on the naming scheme. Mattoo et al. describe "depth" simply as being the characteristic of new PTAs going beyond trade to deeper integration (Mattoo, Rocha, and Ruta 2020). Dür et al. (2014) on the other hand are more explicit and define depth as *"the extent to which (an agreement) requires states to depart from what they would have done in its absence"* (Downs, Rocke, and Barsoom 1996). As already noted in the literature review, the term "depth" alone is not articulate enough to describe the various ways in which PTA characteristics might differ. Therefore, this paper introduces the two related terms *"horizontal depth"* and *"vertical depth"*. Horizontal depth refers to non-tariff issues that are covered within a PTA, whereas vertical depth refers to the general strength of commitment within a PTA. The creators and collaborators behind the Deep Trade Agreement project do explicitly mention the existence of *vertical* depth, as opposed to *horizontal* depth but left the analysis of different provision depths to future work (Hofmann, Osnago, and Ruta 2017). I introduce two different mechanisms that allow for different pathways of depth influence on trade.

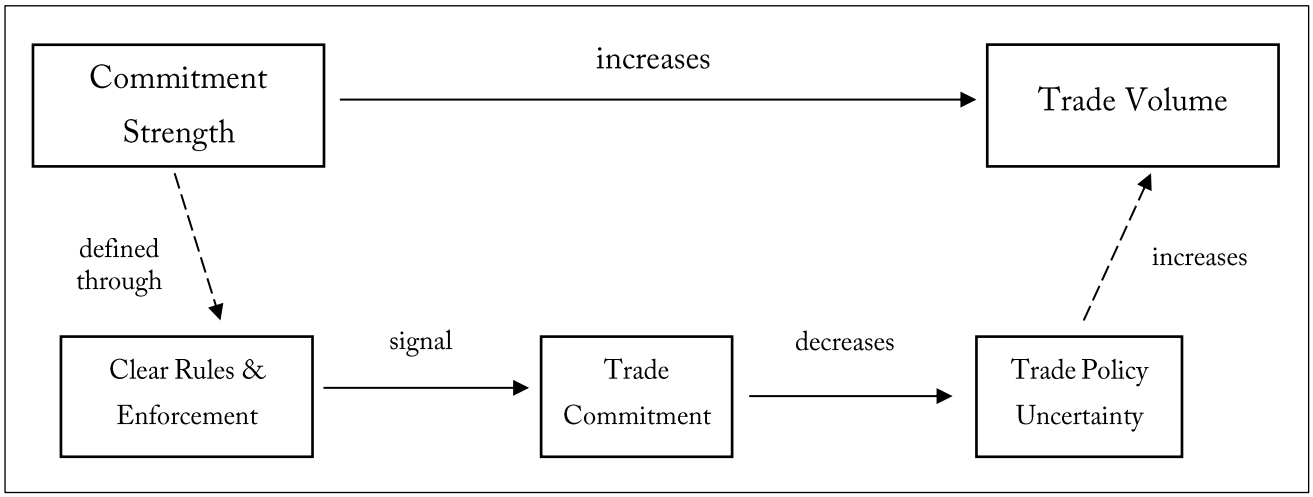
3.2 Effect of Vertical Depth (Commitment Strength) on Trade Flows

Vertical depth, or also commitment strength, can be seen as a measure of legal obligations and rules that members to the agreement have to uphold. One of the fundamental motivations for deeper preferential trade agreements is the provision of a predictable and stable environment for planning and investments. In this context scholars have coined the term "Trade Policy Uncertainty" (TPU). TPUs indicate the stability, predictability and transparency of trade policies (Limão 2016). The literature frequently models trade agreements as repeated games between countries where tariffs are negotiated

on a yearly basis (Limão 2016; Staiger 1995), that allow for trade liberalization. In this model, uncertainty can be further reduced by explicitly declaring in the provisions what is allowed, and how strong the implemented enforcement mechanisms are. A similar mechanism has been proposed by Baccini and Urpelainen (2014), who see PTAs as a tool to signal commitment to reforms to the international community (Baccini and Urpelainen 2014). The researchers have noted that PTAs are a helpful instrument for emerging democracies to tie their hands and to commit to liberal reforms that would have otherwise been met with domestic opposition. However, this paper expands on this framework by stating that commitment signalling does not only happen in emerging democracies. More trade increases countries' absolute wealth, even if they gain relatively less than their trading partners. Gains from trade benefit the elites in autocracies, which they can use to strengthen their clientele and thus their power. In the same vein, gains from trade also benefit democracies in the context of election cycles.[5] Thus, if we assume policy makers to be rational actors that care about maximizing their own gains, they will seek to signal trade commitment, regardless of domestic power structures.

This paper proposes the mechanism that vertical depth of a PTA is an effective tool in signalling to domestic actors and other PTA members that the trade agreement is serious. Thus, vertical depth plays an important role in safeguarding against trade policy uncertainty through commitment signalling. Figure 1 illustrates this mechanism.

Figure 1 Illustration of the Effect of Vertical Depth on Trade Volumes

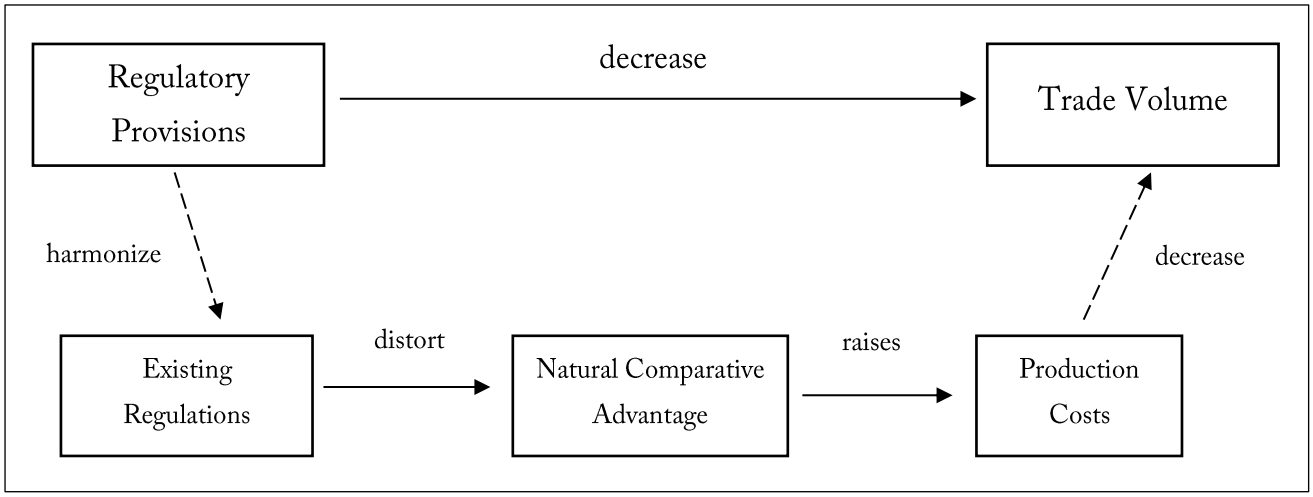


[5] Research has shown that countries hold more elections in periods of international economic expansion to improve chances of re-election (Kayser 2006)

3.3 Effect of Horizontal Depth (Non-Tariff Issues) on Trade Flows

Even though clear rules and enforcement mechanisms are inducive to trade, there are going to be heterogeneous effects depending on the policy area. Implementation of provisions that go beyond simple tariff reduction measures could actually increase trade policy uncertainty. This is due to the regulatory nature of the newer provisions that impose restrictions on importers and exporters and which are increasingly present in newer PTAs. This mechanism is not totally surprising, since empirical studies on agricultural trade have shown that non-tariff issues do in certain ways emulate trade effects that are similar to tariff impositions (Arita, Mitchell, and Beckman 2015). Environmental or labor market regulations in free trade raise issues concerning the most fundamental aspect of trade: Comparative advantage. If country A is subject to different environmental conditions than B, e.g., different levels of pollution and geographical characteristics, then less strict environmental regulations are part of the natural comparative advantage one enjoys over another. If, through regulation, two environmental standards are harmonized with each other, comparative advantages would be lost, leading to less trade. This principle applies regardless of the policy area. We assume that countries trade due to pre-existing natural comparative advantage. Thus, if we intervene in this balance through provisional regulations, gains from trade will be lost and will lead to decreased trade. This is why free trade advocates have feared in the past that environmental and other types of regulations can be used to implement protectionist measures (Esty and Geradin 1997). The mechanism is shown in Figure 2.

Figure 2 Illustration of the Effect of Horizontal Depth on Trade Volumes



The proposed terminology of horizontal and vertical depth allows us to clearly identify the focal points of PTA design and are a major asset for future assessment of PTA design. Vertical depth considers the clarity and strength of obligations, whereas horizontal depth refers to non-tariff policy areas. While the two concepts are straightforward, the proper identification of depth characteristics and quantification of depth shapes up to be one of the more pressing challenges in the literature (Dür, Baccini, and Elsig 2014; Mattoo, Rocha, and Ruta 2020). These challenges are intrinsically linked to the described mechanisms and will have to be discussed in greater detail in the next chapter.

3.4 Hypotheses

H1: Vertical depth in preferential trade agreements increases bilateral trade volumes.

The first hypothesis postulates that clear provisional rules and enforcement mechanisms embedded within the legal framework of the PTA allows member to the agreement to reciprocally lower trade policy uncertainty and stimulate trade. This statement is considered to be true, irrespective of the policy area. In other words, the more rules and conditions to be agreed upon PTA formation in various policy areas, the more will this lead to an increase in trade volumes.

Trade Volume can be described in its basic form to be a sort of transaction. Early on, researchers have broadly considered trade to be either a percentage of exports to another nation, divided by the total amount of exports, or to be the ratio of transactions to the gross national product of the exporting nation (Hughes 1971). Trade Volume can therefore be measured in various ways but is most frequently brought into connection with the annual monetary value of goods transactions. Trade volumes for this paper are represented by the annual value of goods exports measured in US Dollars. Vertical depth needs to be understood as a conceptualization of commitment strength to the PTA in the form of rules and obligations. To recall, rules and obligations facilitate cooperation between members in a repeated game of yearly tariff negotiations, and in turn reduce trade policy uncertainty, which increases the volume of trade. The explicit measurements of the variables will be discussed in the next chapter.

H2.1: Social welfare provisions in preferential trade agreements decrease bilateral trade volumes.

H2.2: Other non-tariff provisions in preferential trade agreements decrease bilateral trade volumes.

Social welfare-enhancing provisions encompass two kinds of policy areas: Environmental law and labor market provisions. The literature makes a distinction between them and other non-tariff provisions, because they are the only ones that can have a direct influence on society that is not related to trade (Mattoo, Rocha, and Ruta 2020). The vertical depth mechanism holds for both of these types of non-tariff policy areas but making a clear distinction is still beneficial in anchoring down the diverse collection of policy areas into two identifiable subsets. To sum up, the second set of hypotheses have a clear focus on provisions which do not have the main goal of reducing or eliminating tariffs. Horizontal depth is a conceptualization of agreement provisions that extend beyond tariff reduction and operate in the territory of regulation as well as coordination of economic activity.

While the clarification of the hypotheses is straightforward, it is important to keep in mind in which context they have been formulated: The core assumption is that PTA membership leads to more trade compared to not being a part of a PTA. In light of the overarching consensus among researchers that PTAs *do* increase trade, parsimony is preferred over complex formulations of the hypotheses.

The confirmation/rejection of the first hypothesis allows me to answer the question, whether PTAs are indeed a driving factor behind trade by lowering uncertainty through clear provisional agreements and frameworks that foster cooperation between members. This hypothesis is crucial, because it indicates an effect of a latent vertical depth variable on trade. This would show new ways in which preferential trade agreements can be conceptually presented. The second set of hypotheses can potentially set the scene to make the distinction between tariff-reducing and non-tariff provisions, which should be studied carefully going forward. The testing of these hypotheses, hinges on careful considerations about the concepts and their operationalization. As Mattoo et al. state, *"the devil is often in the details"* (Mattoo, Rocha, and Ruta 2020) and thus proper attention needed to be paid when it came to the concepts.

4. DATA & METHODOLOGY

4.1 Data

The dataset of choice for this paper is the Deep Trade Agreement dataset (Mattoo, Rocha, and Ruta 2020), since I loosely follow their conceptualization of depth. The DTA dataset is newer than the DESTA dataset (Dür, Baccini, and Elsig 2014), and contains the largest amount of information on PTA provisions spread over 18 different policy areas. The dataset contains, among other things, country-dyad information on PTA agreements and their provisional contents for the period ranging from 1970 to 2017. The researchers do not claim that their coverage of the policy areas is exhaustive, but rather that the policy areas are included in at least 20 percent of all notified PTAs (Mattoo, Rocha, and Ruta 2020). This gives us an overview of the most relevant policy areas, without including too many outlier observations like PTAs with human rights provisions, which are relatively rare. The dataset structure is a data matrix, where the rows represent time-series country-dyads and where the columns are made up of binary values, each column indicating the existence of a specific provision for a specific policy area[6]. 18 policy areas are therefore spread over approximately 50 columns each, with a theoretical limit of over 900 provisions for each dyad. In practice, the maximum number of provisions per dyad does not exceed 640, since some columns indicate mutually exclusive provisions and others describe additional provision sub-questions that are not relevant to the substance of the provision.

4.2 Main Variables

Trade Volumes

For the trade volume variable, I rely on the OECD database on trade statistics (OECD 2021), which reports bilateral goods exports as a measure of US dollars (thousands). While trade in services continues to rise in importance and should ideally be accounted for in the analysis, it is limited in country observations and in the time period. Therefore, the focus is on the trade in goods. No further

[6] 1 indicates that the specific provision exists in the PTA and 0 indicates otherwise.

variable manipulation is needed, like the division by total exports (Hughes 1971), since this is taken care of by the specification of the gravity model.

Vertical Depth Indices

This paper previously alluded to vertical depth being the conceptualization of commitment strength. The most important element to consider for vertical depth, is the number of provisions that are included in a PTA, and what exactly those provisions entail. The most parsimonious approach to constructing the depth variables is by identifying, which provisions foresee the creation of new rules and obligations across all available policy areas, and then adding them together into the vertical depth variable. Vertical depth is operationalized to make no distinction between provisions in their respective policy area. The only defining asset is that they were implemented to create and/or clarify rules and obligations. This classification can be obtained by filtering for all sub-categories of provisions that are specified to be essential. In addition to the original vertical depth variable, I also construct a more general *"depth"* variable that takes into account all provisions, regardless of whether their content is substantive or corollary in nature, to later contrast it to other vertical depth variables.

Horizontal Depth Indices

Mattoo et al. code PTA provisions into 18 different policy areas and categorize them into three broader domains: One domain directly impacts the flow of goods, services, capital, people and ideas. This category represents the "core" of a PTA (Mattoo, Rocha, and Ruta 2020). This category includes the policy areas of *tariff and export taxes, services, investment, movement of capital, migration,* and *intellectual property rights.* The second and third domains that the researchers take note of is the one that regulates economic integration through the "restriction of government discretion" (Mattoo et al., 2020, p.9). This domain includes the policy areas *rules of origin*, *trade remedies*, *public procurement*, *technical barriers to trade*, *sanitary and phytosanitary measures*, *state-owned enterprises*, *subsidies* and *competition policy.* The researchers additionally mention that *environmental law* and *labor market* regulations, like the previous policies in the second domain, fall into export regulating provisions, however with the difference that they specifically enhance social welfare (Mattoo, Rocha, and Ruta 2020, p. 9). Concerning the policy area classification I take a more aggregate view on policy areas, and focus on policy areas that can be regarded as belonging to the category of regulatory provisions. The

horizontal depth variable is thus constructed by adding all provisions together that belong to the type of regulatory provisions. However, I expect environmental and labor provisions, which are part of Mattoo et al.'s third domain, to have a greater regulatory impact on export than some other more ambiguous policy areas, like *rules of origin*, *trade remedies* or *subsidies*. There are good reasons to believe so, given that empirical evidence attributes strong regulatory characteristics especially to provisions relating to environmental concerns or labor market regulations (Lechner and Spilker 2021; Ornelas 2012; Raess, Dür, and Sari 2018). Furthermore, it seems unlikely that all non-tariff provisions are homogenous in their regulatory effects and should be clumped together in one category.

For a more comprehensive analysis of horizontal depth, I therefore look at provisions that are social welfare-enhancing, namely environmental law and labor market provisions (Mattoo, Rocha, and Ruta 2020, p. 9). These two provisions belong to the "core" of my horizontal depth index. I then define peripheral horizontal depth as those provisions that belong to Mattoo et al.'s second category, which put limits on "government discretion" (2020, p. 10). The indicators themselves are constructed in the same way, by summation of the values that indicate the presence of certain provisions within a policy area.

4.3 Content Analysis of the Provisional Columns

In table 1 a selection of examples of the provisions that are coded in the DTA dataset are given.[7] This selection is not exhaustive, as there are 16 sub-categories of provisions spread over 18 policy areas, for a total of over 900 binary content-analysis variables. The existence of a given provision is coded as a "1", whereas the absence of such a provision is coded as "0".

[7] Information about the variables and their description was accessed via the World Bank's Deep Trade Agreement website: https://datatopics.worldbank.org/dta/table.html

Table 1 Provision Information

Category	Provision Description	Policy Area
Conditions/Obligations	"Does the agreement require the establishment/existence of competition law/measures?"	Competition Policy
Cooperation	"Does the agreement provide for cooperation and technical assistance to any party?"	Subsidies
Enforcement Mechanism	"Does the investment chapter include a mechanism for the settlement of disputes between covered investors and the host State (ISDS)?"	Investment
Exceptions	"Does the agreement allow for security exceptions?"	Competition Policy
Institutional Frameworks	"Does the agreement establish an intergovernmental committee on environment?"	Environmental Law
Liberalization/Integration	"Prohibits an increase in the rate of any existing export tax"	Export Taxes
Transparency	"Does the agreement require transparency of ownership, governance and financial information?"	State-Owned Enterprises
Safeguards	"Does the agreement contain a safeguard for 'external financial difficulties'?"	Movement of Capital
Scope and Definitions	"Does the agreement contain provisions clarifying the hierarchy/relationship between the investment chapter/protocol and the other chapters?"	Services
...	...	...

4.4 Control Variables

For the control variables, I envisage a model specification using the simple gravity model. The most important control variables in the gravity model shape up to be economic size, as measured by GDP, the relative distance between two nations, as measured in kilometers, and their population size. Furthermore, I also control for regime type, by means of the Polity index (Marshall, Gurr, and Jaggers 2017). The literature on the nexus between democracy, trade flows and PTAs necessitate the accommodation for regime variations in multilateral trade frameworks (Baccini and Urpelainen 2014;

Jo and Namgung 2012; Mansfield and Milner 2018). I specifically do not control for the frequently used indicators of past colonial ties since these variables are almost exclusively used in endogenous PTA models as instrumental variables to establish a causal relationship (Egger et al. 2011; Magee 2003).

4.5 Gravity Model

Initially criticized for being void of any theoretical foundations, Tinbergen's first-ever linkage between Newton's law of universal gravitation and trade flows has since become a massive success due to its predictive power (Shahriar et al. 2019; Tinbergen 1962). Its basic structure has given birth to many differentiated models and is still a very active domain of research. In its most basic form, the gravity model can be represented as follows:

$$Trade_{ij} = \alpha \frac{\mathrm{GDP_i}\ \mathrm{GDP_j}}{Distance_{ij}}$$

The attributes of the gravity model which were rehauled by Anderson (Anderson 1979) and then refined by subsequent scholars make them an effective tool in economic policy research for a variety of reasons: Gravity models possess a solid formal-theoretical foundation coupled with a description of a general equilibrium that incorporates models with multiple countries, sectors and firms[8]. The flexibility of the gravity model allows for the accommodation of other equilibrium frameworks such as trade policy, labor markets and environmental policy. As such, the gravity model is ideal for studying the effect of trade agreements depth on trade volumes.

4.6 Estimation Strategy

The main DTA dataset is comprised of time-series observations for all country dyads that are reported to share a common PTA. Now that the concepts are operationalized and constructed, the data structure makes it clear that a two-way fixed effects regression is the best choice for the statistical model. Two-way fixed effects are used to control for unit-specific and time-specific confounders at the same time. We assume that there are dyad-invariant and time-invariant variables that we cannot control for in a regular fashion. Because I am dealing with multiple dyad observations for the same

[8] Early trade theories explain trade flows in single market or two-country constellations.

country pair, I am taking into account that there are characteristics that are unique for a specific country pair. The final model specification can be formulated as follows:

$$Y_{TradeVolume\,(Dyad,\ Year)} = \mu + \gamma_{Dyad} + \delta_{Year} + \alpha D_{Depth\ Indicator} + X'_{\underline{GDP}\ \ Distance}\beta_1 + X'_{Population}\beta_2 + X'_{PolityV}\beta_3 + \varepsilon$$

It is important to note that two-way fixed effects do not allow for the assessment of dyad-level variables that do not change over time. This implies that the model does not capture PTAs provisions' effects on trade, which do not change over time. This is of major importance for a couple of reasons: First, I leave out non-PTA observations for all country dyads, which limits the time scope of the data. No longer am I observing the data points over the whole time where two countries have trade relations. Instead, I am examining dyads from the moment of PTA creation, and seeing how progressively expanding PTA provisional frameworks change trade volume over time. This approach is not meant for capturing the effects of "static" PTAs, but rather dynamic PTAs that vary over time. This represents one of the limitations of the paper, and its implications will be discussed in the next few chapters. To capture the effect of *static* PTA's, I would have had to implement a conventional structural gravity model within a 2SLS instrumental variables framework (Baier and Bergstrand 2007, 2007; Egger et al. 2011). Lastly, the two-way approach holds constant individual country-dyad characteristics and is thus unable to generalize the effects within the broader framework of specific multilateral trade agreements. An alternative approach would be to control for PTA-fixed effects. In the end, the dyad-level two-way fixed effects allow for effective estimation of horizontal and vertical depth effects on trade volumes, while considering dyad-specific characteristics and time-invariant variables. Table 2 gives an overview of the main dependent and independent variables and their operationalization.

Table 2 Variables Overview

Concept	Operationalization	Variable
Trade Volume	US Dollars (thousands)	"Value"
Vertical Depth	Sum of All Provisions	"Vertical"
	Sum of Scope/Definition Provisions	"Scope"
	Sum of Enforcement Provisions	"Enforcement"
	Sum of Cooperation Provisions	"Cooperation"
	Sum of Conditions/Obligations Provisions	"Condition"
	Sum of Transparency Provisions	"Transparency"
Horizontal Depth	Sum of Environmental Law Provisions	"Environment"
	Sum of Labor Market Provisions	"Labor"
	Sum of Other Non-Tariff Provisions	"Periphery"

5. RESULTS & DISCUSSION

5.1 Descriptive Statistics

Table 3 gives an overview of the variables used in the analysis. I log-normalized the values for the variables *Value* (Exports in US Dollars), *population_A*, *population_B*, *GDP_A*, and *GDP_B* for further analyses, due to their skewed distribution and to match the value range to the provisions. The quantile distributions of the polity variables show that most countries are democratic, rather than autocratic. *Vertical depth* variables show a maximum sum of 640 provisions with a mean of 117, which drops to a mean count of 19, when only taking into account provisions related to rules, enforcement mechanisms and obligations. The maximum value for *horizontal depth* variables is 256 provisions related to non-trade barriers.

Table 3 Descriptive Statistics

Variable Name	Mean	SD	Min	Max
Dependent Variable				
Value (USD)	1'777 mio.	10 mio.	0.002 mio.	364'959 mio.
Independent Variables				
Vertical (combined)	117.02	107.79	9	640
Scope	12.47	11.08	1	58
Enforcement	7.86	9.12	0	55
Cooperation	7.29	7.06	0	26
Condition	11.27	9.09	0	66
Transparency	6.81	9.47	0	64
Environment	8.11	9.16	0	39
Labor	1.90	3.49	0	18
Periphery	62.50	47.97	9	256
Control Variables				
Polity	5.10	5.66	-10	10
Population	54 mio.	153 mio.	0.40 mio.	1'386 mio.
GDP (USD)	0.42 tln.	1'103 tln.	0.59 tln.	17 tln.
Distance (km)	5'615	4'986	59	19'772

5.2 Vertical PTA Depth

Table 4 gives an overview of the estimated coefficients of the analysis, which seek to confirm or reject the first hypothesis: *Vertical depth in preferential trade agreements increases bilateral trade volumes*. Overall, the vertical depth indicators show no significant relationship between them and trade volumes. All provisions together indicate no significant effect on Trade Volumes. The same is true for all sub-categories of provisions, except for *Cooperation*, where provisions related to cooperation indicate a negative and significant effect on Trade Volumes. Based on the results, I conclude that there were no particular effects of the *vertical depth* indicators on bilateral trade volumes. In the case of *Cooperation*, the direction of the coefficient is even contrary to the proposed theory. Concerning *Conditions and Obligations* the effect on trade is positive, but not significant to garner further attention.

I thus rejected the first hypothesis, which claimed that clear provisional rules mechanisms integrated within a PTA lead to a reduction in trade policy uncertainty and thus an increase in trade.

Table 4: Vertical Depth Models

	Trade Volumes in US Dollars (thousands)					
All Provisions	-0.0001					
	(0.0001)					
Scopes and Definitions		-0.001				
		(0.001)				
Enforcement Mechanisms			-0.002			
			(0.002)			
Cooperation				-0.006**		
				(0.003)		
Conditions and Obligations					0.0005	
					(0.002)	
Transparency						-0.002
						(0.001)
GDP A (log)	1.075***	1.075***	1.076***	1.074***	1.074***	1.076***
	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)
GDP B (log)	0.978***	0.978***	0.979***	0.977***	0.977***	0.979***
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)
Population A (log)	0.045	0.045	0.043	0.041	0.048	0.046
	(0.061)	(0.061)	(0.061)	(0.061)	(0.061)	(0.061)
Population B (log)	0.311***	0.312***	0.311***	0.307***	0.316***	0.312***
	(0.060)	(0.060)	(0.060)	(0.060)	(0.060)	(0.059)
Polity A	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Polity B	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
N	87551	87551	87551	87551	87551	87551
R-squared	0.042	0.042	0.042	0.042	0.042	0.042
Adj. R-squared	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026
F Statistic (df = 7; 81714)	514.874***	514.797***	514.929***	515.507***	514.776***	514.935***

***p < .01; **p < .05; *p < .1

5.3 Horizontal PTA Depth

Table 5 displays the results from the analysis of the *horizontal depth* variables, which will be used to reject or confirm the second hypothesis: *Horizontal depth in preferential trade agreements decreases bilateral trade volumes.* The first horizontal depth indicator variable, *Environmental Law,* suggests a negative and significant ($p < 0.05$) relationship between horizontal depth and trade. On a similar note, the second indicator *Labor Market* reports a highly significant, negative relationship between horizontal depth and trade volumes. Lastly, *Periphery* also indicates a negative relationship, however, the effect is not statistically significant this time. this time the effect not statistically significant. These results indicate that regulatory provisions falling under the category of social welfare-enhancing policies would actually lead to a lesser increase in total trade, when compared to baseline PTAs that do not entail such provisions. The empirical evidence therefore partly confirms my second

Table 5: Horizontal Depth Models

	Trade Volumes in US Dollars (thousands)		
Environmental Law	-0.004**		
	(0.002)		
Labor Market		-0.014***	
		(0.004)	
Periphery			-0.0001
			(0.0003)
GDP A (log)	1.075***	1.075***	1.074***
	(0.034)	(0.034)	(0.034)
GDP B (log)	0.978***	0.978***	0.977***
	(0.030)	(0.030)	(0.030)
Population A (log)	0.038	0.042	0.046
	(0.062)	(0.061)	(0.061)
Population B (log)	0.306***	0.309***	0.313***
	(0.060)	(0.059)	(0.060)
Polity A	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)
Polity B	0.008***	0.008***	0.008***
	(0.002)	(0.002)	(0.002)
N	87551	87551	87551
R-squared	0.042	0.042	0.042
Adj. R-squared	-0.026	-0.026	-0.026
F Statistic (df = 7; 81714)	515.402***	516.203***	514.784***

***p < .01; **p < .05; *p < .1

hypothesis that regulatory provisions introduce inefficiencies that are able to affect trade volumes, but with a crucial caveat: Not all regulatory provisions affect trade, but only those that aim to enhance social welfare.

These results are best interpreted at the marginal scale. A concrete example of how exactly horizontal depth might influence bilateral trade volumes can be given by considering a unit change in provisions (whether or not a specific provision exists) for a typical country-dyad. The mean values of the covariates are used to model a "typical" dyad, to illustrate the change in trade volumes relating to horizontal depth: In a country-pair consisting of two similar countries with a population of about 50 million people, a nominal GDP of approximately 400 billion USD with a mean distance of 5000km and slightly democratic institutions, adding one more environmental provision to the trade agreement would equal to a potential loss of about 7 billion USD in exports. For labor market provisions, the effect is even stronger: One additional labor market provision would add potential losses of 27 billion USD in exports. For comparison, only 188 million USD would be lost for each additional regulatory provision other than those enhancing social welfare, ignoring significance levels. These results, however, need to be interpreted with caution, as they represent broad generalizations over a non-existing archetypical dyad that does not take into account dyad characteristics in the real world.

5.4 Robustness Checks

For the robustness checks, I conducted the Durbin-Wu-Hausman specification test to confirm whether random-effects or fixed-effects models are more suitable for the analysis. The results of the hypothesis tests suggest that the fixed-effects estimator is better suited than the random-effects model. The alternate hypothesis (fixed-effects are better) is confirmed for all model specifications with their corresponding independent variables. An overview of the specification tests is given in the appendix.

5.5 Discussion

The results of the analysis paint an interesting picture: The sheer mass of provisions and clauses related to rules, conditions, enforcement mechanisms in preferential trade agreements do not seem to impact trade much, but clauses specific to individual policy area clauses might. I did not find empirical evidence for the claim that PTA provisions relating to enforcement mechanisms, scopes and clarifications are positively associated with increased trade. However, it is interesting to note that

environmental law and labor market regulations seem to have a dampening effect on trade. Many previous studies have investigated the causal link between PTA clauses and their intended provisional effects in their respective domain, for example environmental law on air quality (Lechner and Spilker 2021), or labor regulations and their effects on domestic labor markets (Raess, Dür, and Sari 2018). The results from this study are insofar interesting that PTA provisions not directly related to tariff-issues do have a discernible impact on exports.

Based on the results, I rejected the theoretical claim that vertical depth, as measured by the number of individual provisions, can lead to increased trade due to a reduction in trade policy uncertainty. I confirmed the second theoretical mechanism that horizontal depth decreases trade volumes. However, this effect is only observable when provisions related to environmental and labor law are present in an agreement. It is interesting to note that the findings on vertical and horizontal depth seem to go against traditional wisdom. Previously, scholars have attributed trade-enhancing effects to PTAs, the deeper they were (Limão 2016). However, one difference in this paper has been that commitment strength and policy areas have been decoupled from each other and are not comparable to the conceptualization of depth as in the case of the DESTA or the DTA project. The results indicate that mere summation of obligations and enforcement mechanisms do not say anything valuable about the strength of trade. Clear delimitations of obligation provisions within certain policy areas are likely the main drivers of trade. The next logical step would be to accurately study the possible policy configurations of PTAs and their implications.

To sum up, the findings of the first hypothesis go against established theories on PTA design and trade effects, indicating that *deeper* PTAs generally are inducive to trade and not the other way around (Mattoo, Rocha, and Ruta 2020). Regarding the second hypothesis, the results invite subsequent qualitative studies to more carefully dissect PTA policy areas and to come up with theories on how exactly the mechanism works that leads to reduced trade volumes when compared to baseline PTAs that are not concerned with provisions that extend beyond tariff-regulation.

6. CONCLUSION

6.1 Summary

This paper examined the trade implications of new forms of PTAs that are rapidly proliferating on a global level. PTAs nowadays are characterized through their "deep" character, meaning that they progressively become more complex and expansive. PTAs are evolving to become more regulated and at the same time to become more far-reaching in their policy areas. PTAs now cover more and more non-tariff issues that go beyond direct the reduction of trade barriers. Previous research has shown that PTA membership in general increases the amount of trade between nations and even more so when considering the complex causal structure between trade and PTA formation. What has not been exhaustively researched yet, is how variations in trade agreement provisions and clauses, might affect international trade, depending on the underlying configuration of the PTA. Research in this area has been rather slow in the past, not only due to the lack of quality data but also because much of the literature on PTA characteristics has emerged in the wake of the stalling of the Doha Development Round. However, remarkable progress has been made by researchers in the last few years to construct empirical datasets in a way that enables us to take a look *inside* PTAs and to examine their provisional make-up and their qualitative characteristics. Two of the latest datasets on PTA characteristics are the Design of Trade Agreements Database (Dür, Baccini, and Elsig 2014) and the Deep Trade Agreement Dataset (Mattoo, Rocha, and Ruta 2020).

This paper studied the effects of PTA commitment strength and policy area coverage to discern whether they reduce or increase trade relative to baseline PTAs that are defined by neither strong commitments nor expansive policy setting. I used the Deep Trade Agreement Dataset to construct two families of PTA depth indicators, namely *Horizontal* and *Vertical Depth*. Vertically deep PTAs were hypothesized to increase trade volumes compared to "shallower" PTAs due to increased presence of provisional clauses related to enforcement mechanisms and obligations, reducing uncertainty and stimulating trade. Horizontal depth, on the other hand, was hypothesized to decrease trade volumes, due to their regulatory nature and the imposition of standardized rules that disrupt the natural comparative advantage between nations.

Vertical depth indicators were constructed by cumulative addition of (i) all available provisions for a given country-dyad and (ii) the addition of provisions that specifically regulate the scope, enforcement, conditions or transparency of the PTA. Horizontal depth indicators were defined through two important characteristics: Existence of non-tariff provisions that aim to increase (i) welfare and (ii) regulate government discretion. The "core" of the horizontal depth indicators consists of environment and labor market policy areas. The "periphery" includes all other provisions relating to non-tariff barriers. This distinction was also used in previous research that intrinsically separates regulatory provisions that enhance social welfare from those that generally limit government discretion (Mattoo, Rocha, and Ruta 2020).

6.2 Limitations

Assumptions and Delimitations

One limitation about the assumptions that were subject to discussion in Chapter 3 is that I define PTAs very broadly, which encompasses agreements ranging from FTAs, to PTAs and RTAs. There is thus a lack of distinction between FTAs and PTAs, which is sometimes made in research, especially when considering that FTAs are a subset of PTAs that allow full reciprocal tariff preferences on all the products (Baena-Rojas and Herrero-Olarte 2020).

Theory and Concepts

One of the significant conceptual limitations is the choice of operationalization of the vertical and horizontal depth variables. This paper has opted to follow the path of "slightest resistance" when it comes to variable operationalization: Adding up all the provisions linearly and with basic categorization into sub-categories and policy areas. All the variable construction followed the format of simple addition. What has not been incorporated from the DTA dataset in this paper, is the textual content derived from the description of the provisions. To fully understand country-dyad agreements, it is paramount to understand which specific provisions have been agreed upon and how the content from these different provisions relates to each other. It is evident that mere addition is not quite adequateto capture the intricate relationship between provisional articles, which is most likely multi-layered and non-linear. Slight changes in variable construction might lead to different results in

reproduction studies. The decision to clump some categories together while not doing it for others is thus somewhat arbitrary. In reality, there are exponentially more configurations available, than there are policy areas and categories.

Another theoretical limitation concerns the question of time: For what time windows are the mechanisms valid? Are there differences between short-term and long-term effects of PTA depth? One hypothetical scenario concerns the second hypothesis. Regulatory provisions that seek to enhance social welfare might reduce trade due to adjustment costs in the short-term but could lead to net gains further down the road. There is also the issue of compliance. Are trade agreements with heavy-handed regulations and stringent rules really more effective than comparably "lax" PTAs? This paper assumes that there is 100% provisional compliance, which is rarely observed and is another proactive area of research (Lechner 2016). It seems that one deciding factor of this issue would be the actual enforceability of those rules, which is most likely a function of reciprocal monitoring and the existence of independent ruling bodies. Therefore, factors related to compliance should be addressed by analyzing specific info from the textual provision descriptions.

Methodology

One methodological limitation that has already been touched upon is the two-way fixed effects model. Two-way fixed effects are commonly used in panel data settings and difference-in-difference estimations. However, like the operationalization of the variables, two-way fixed effects rely heavily on assumptions of linearly additive effects, which leads to bias in the estimation of trade effects (Imai and Kim 2021). Additive effects are easy to interpret but do almost certainly not approach the real essence of legal agreement provisions, which are likely not cumulative, but complementary, synergistic, and/or often just plain redundant. Lastly, fixed effects do not allow for estimation of time-invariant control variables, even though it would be helpful to consider previous colonial ties and the historical context of two trading nations. Thus, the explanatory power of two-way fixed effects models is debated in quantitative social science circles.

6.3 Future Research

Future research should be focused on two things: First, what are the major distributional consequences of PTA provisions? This paper has shown that regulatory provisions can disrupt trade; examining what these impacts are on a domestic level is an important topic that needs to be discussed. Many different domestic actors are known to shape PTA formation and negotiation (Lechner 2016), and they are crucial to understanding PTAs better in the context of trade flows. This area of research has not yet been exhaustively covered and might provide new insights into interactional effects between domestic actors and PTAs. Second, how can we improve the quantification of *depth*? Quantification of provisional clauses through an in-depth examination of the textual content is the next logical step in improving the conceptualization of the depth variable. Researchers have emphasized the usage of machine learning techniques such as random forest models to uncover linear relationships between provisional clauses and their outcome variables (Mattoo, Rocha, and Ruta 2020). There are infinitely many ways to combine provisions and policy areas into conceptualizations of depth, which would make comparisons of different provision baskets with classification tools a worthwhile endeavor.

6.4 Policy Implications

The perhaps most important question remains unanswered so far: What is the big picture? The results from the horizontal depth indicators paint an exciting story. Environmental and labor provisions have a noticeable negative impact on the trade of goods. Then why do trade agreements progressively cover those areas? Researchers suggest that preferential trade agreements increasingly become instruments of global neoliberal governance (McCarthy 2004). The connection to the environmental Kuznets curve has been made where, as the global economy develops, more and more emphasis is placed on environmental considerations. If seen from the Kuznets curve perspective, non-tariff regulations in PTAs represent a natural evolution of trade agreements away from the prospect of infinite growth and towards sustainability. Similarly, labor standards become increasingly important as an economy goes through the developmental stages. Progressively deeper PTAs that tackle non-tariff issues limit the growth trajectory of a nation in terms of trade. The results of this paper indicate some constraint imposed by non-tariff provisions, which shows, according to the theory, that regulations are effective and that they do have an impact on trade and beyond. Therefore, they provide

solutions to address the challenges we face in the 21st century, namely climate change and sustainable development. Taking into consideration that the WTO development rounds are not going anywhere in the near future, PTAs allow us to take back some control over global governance through trade liberalization. Trade agreements will proliferate even more in the future and it is important that we know the recipe for their optimal design. They are the solution to break the spell of inaction of the past decades. Facing these challenges will amount to some sacrifice of short-term gains in trade in favor of long-term gains through sustainable governance. Nonetheless, it is but a small price to pay in the grand scheme of things.

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8. APPENDIX

8.1 Robustness Checks

Table 6 Robustness Checks: Durbin-Wu-Hausman Test

Regression Model	Chi-Squared	P-Value	Degrees of Freedom
Vertical_All Test	541.76	$p < 0.05$	7
Scope Test	458.60	$p < 0.05$	7
Enforcement Test	469.86	$p < 0.05$	7
Cooperation Test	426.17	$p < 0.05$	7
Condition Test	417.48	$p < 0.05$	7
Transparency Test	536.69	$p < 0.05$	7
Environment Test	428.42	$p < 0.05$	7
Labor Test	453.98	$p < 0.05$	7
Periphery Test	432.79	$p < 0.05$	7

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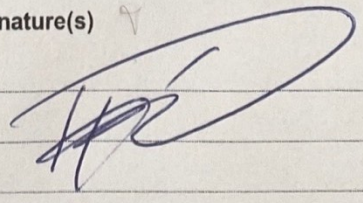
Rupperswil, 19. January 2022	

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