RCEP
Regional Comprehensive
Economic Partnership Agreement

USMCA
United States-
Mexico-Canada
Agreement

EU
European Union

AfCFTA
African Continental
Free Trade Area

CPTPP
Comprehensive and Progressive
Agreement for Trans-Pacific
Partnership

Ana Margarida Fernandes, Nadia Rocha and Michele Ruta

The Economics of Deep Trade Agreements

WORLD BANK GROUP

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Edited by Ana Margarida Fernandes, Nadia Rocha and Michele Ruta

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FOREWORD

The nature of international trade has changed significantly in recent years. Multilateral trade negotiations have stagnated and suffered setbacks, while bilateral and regional agreements have surged in number. This shift is redefining the complexities of international trade, as the growing number of regional agreements no longer focus predominantly or exclusively on trade, but affect a range of other policy areas, such as the international flows of investment and labour, and the protection of intellectual property rights and the environment. This growth in 'deep trade agreements' (DTAs) has raised important questions about their wider impact and influence on how countries transact, invest, work, and, ultimately, develop.

This CEPR-World Bank eBook brings together leading experts in international trade from academia and policy institutions to provide new analysis on the determinants of DTAs, how they influence trade and non-trade outcomes, and how they might affect trade relations in a post-COVID-19 world. The consensus is that this new generation of trade agreements, which aims to achieve much deeper integration of the economies of participating countries, can have a positive effect on growth and development. However, they risk leading to greater fragmentation in the world economy. The editors conclude that a revival of meaningful multilateralism is essential to complement DTAs in a post-COVID-19 world.

The eBook starts with an introduction by the editors, and then continues with various contributions using detailed data from the World Bank to provide valuable insights and a richer understanding of the effects of DTAs on a range of key areas concerning the economic impact of deep trade agreements, their political economy and institutional design, the role of DTAs in regulating border and behind-the-border measures, and non-trade issues in trade agreements.

As DTAs become increasingly widespread, fully understanding and accurately measuring their complex effects on a range of policy areas, not all of which are beneficial, will be essential for policymakers and trade negotiations in the future. This publication makes a considerable contribution towards this goal.

CEPR is grateful to Ana Margarida Fernandes, Nadia Rocha, and Michele Ruta for their editorship of this eBook. Our thanks also go to Sophie Roughton and Alexander Southworth for their expert handling of its production.

CEPR, which takes no institutional positions on economic policy matters, is delighted to provide a platform for an exchange of views on this important topic.

Tessa Ogden

Chief Executive Officer, CEPR

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INTRODUCTION

The economics of deep trade agreements

Ana Margarida Fernandes, Nadia Rocha, and Michele Ruta
World Bank

Pascal Lamy, former Director General of the World Trade Organization (WTO), recently wrote:

> More than tariffs, trade agreements today are about regulatory measures and other so called "non-tariff measures", that were once the exclusive domain of domestic policy-making. For these reasons, "deep" trade agreements, as trade experts refer to this new class of agreements, are fundamentally different than the previous generation of trade agreements. (Lamy, 2020).

This eBook brings together recent research on the economics of Deep Trade Agreements (DTAs). What are the determinants of DTAs? How do they affect trade and non-trade outcomes? Are these effects different from those of shallow trade agreements? The research builds on the detailed information collected by the World Bank, in collaboration with other partners, on the content of Preferential Trade Agreements (PTAs) in force and notified to WTO up to 2018.[1] The chapters cover four main areas of analysis focusing on the economic impact of deep trade agreements, their political economy and institutional design, the role of DTAs in regulating border and behind-the-border measures, and non-trade issues in trade agreements.

FROM PREFERENTIAL TRADE AGREEMENTS TO DEEP TRADE AGREEMENTS

Preferential trade agreements have always been a feature of the world trading system but have become more prominent in recent years. Starting in the early 1990s, the number of PTAs has increased from 50 to more than 300 within three decades. While WTO rules still form the basis of most trade agreements, PTAs have in some sense run away with the trade agenda. The result is that PTAs have expanded their scope. While the average PTA in the 1950s covered 8 policy areas, in recent years they have averaged 17 (Figure 0.1). At the same time, the number of commitments that governments have taken in trade agreements has largely increased, along with provisions requiring stronger transparency

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1   In this eBook we use the term PTA to refer to all types of reciprocal trade agreements, Regional Trade Agreements (RTAs), Free Trade Agreements (FTAs), and Customs Unions (CUs), both within and across regions. DTAs are PTAs that contain provisions aimed at deepening economic integration between trading partners.

and enforcement mechanisms. The new World Bank data provide evidence of the evolution from PTAs to DTAs both on the extensive margin (number of policy areas covered) and the intensive margin (commitments within a policy area).

FIGURE 0.1   NUMBER OF POLICY AREAS COVERED IN PTAS, 1970-2017
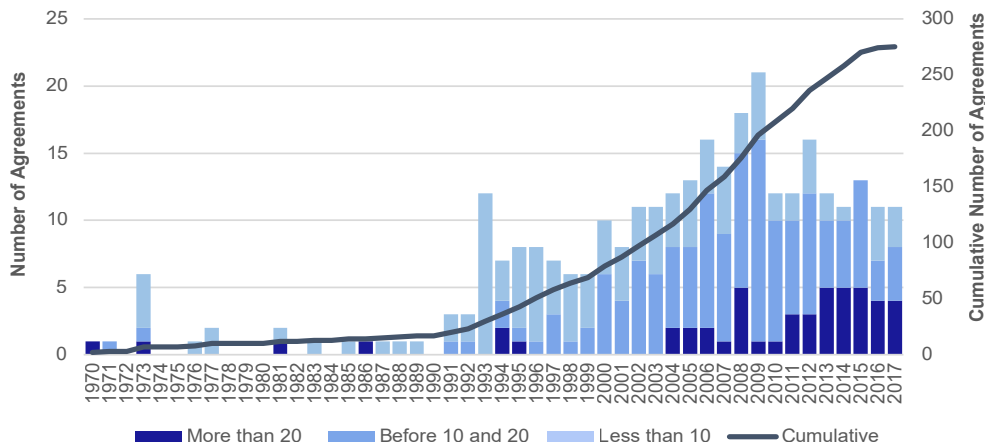
Source: Authors' calculations based on Hofmann et al. 2019.

Economists traditionally evaluate trade agreements on the basis of the market access they create. Given the complexity of policy areas that are covered by DTAs, the metric of market access – while still important – appears inadequate. The recent Handbook of Deep Trade Agreements (Mattoo et al. 2020) proposes to define DTAs as international arrangements that aim to regulate three (partially overlapping) sets of policy areas (Figure 0.2).

- First, the core policy areas in DTAs aim to establish five economic integration rights: free (or freer) movement of goods, services, capital, people and ideas.[2] The policy areas that directly impact these flows include: tariffs, export taxes, services, investment, movement of capital, visa and asylum, and intellectual property rights.

- Second, DTAs cover policy areas that aim to support these economic integration rights by limiting government discretion. Actions by importing governments that limit international flows can be taken at the border and behind-the-border and are often of a regulatory nature. Policy areas that fall in this category include: customs, rules of origin, trade remedies, public procurement, technical barriers to trade (TBT), sanitary and phytosanitary measures (SPS), state-owned enterprises (SOEs), subsidies, and competition policy.

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2   DTAs "aim to establish" rather than "establish" economic integration rights, as they may cover only a subset of these rights and/or not all provisions may be justiciable.

- Third, DTAs cover policy areas that aim to enhance social or consumer welfare by regulating the behaviour of exporters. Policy areas such as environment and labour impose obligations on exporters to further consumer or social interests. Rules in areas such as competition, SOEs, and subsidies can have a dual aspect: in addition to regulating actions that undermine economic integration rights, they can aim to address distortionary measures that lower economic efficiency.

FIGURE 0.2   A CLASSIFICATION OF POLICY AREAS IN DTAS
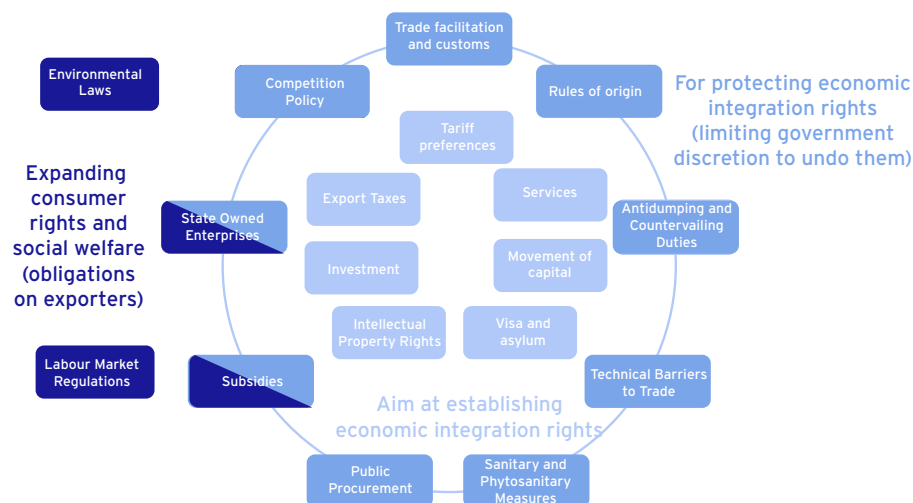
Source: Mattoo, Rocha, Ruta (2020).

A PREVIEW OF KEY FINDINGS OF THE ECONOMICS OF DEEP TRADE AGREEMENTS

Exploiting the new data on the content of DTAs, the studies summarised in this eBook investigate old and new questions on economic regionalism. Of course, there is a large body of literature on the causes and consequences of preferential trade agreements – Freund and Ornelas (2010) and Limao (2016) provide excellent surveys of this literature. Differently from most of this work, the new research builds on pathbreaking studies by Lawrence (1996), Baldwin (2011), and WTO (2011) that emphasise the changing nature of trade agreements from shallow arrangements focused on tariff preferences to deep arrangements.[3] The chapters in this eBook investigate the causes and consequences of DTAs, paying special attention to the role of the various policy areas and specific provisions embedded in these agreements.

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3   In recent years, a growing number of studies have looked at the economics of deep trade agreements. A partial list includes: Mattoo et al. (2017), Mulabdic et al. (2017), Lee et al. (2019), Osnago et al. (2019), Laget et al. (2020), Maggi and Ossa (2020), Dhingra et al. (2021).

At the risk of oversimplifying, seven main findings emerge from this body of research:

- DTAs promote trade integration, thus having a positive effect on welfare. National borders create trade costs that fragment markets and limit growth opportunities, especially in developing countries. Deep trade agreements provide the institutional underpinning of market integration and are found to have positive effects on trade and welfare well beyond shallow trade agreements that lower preferential tariffs. The impact of DTAs on aggregate trade can be driven by a subset of key provisions, although precisely identifying which provisions matter and which don't is difficult in light of the high collinearity between different provisions.

- The content of DTAs is affected by economic and non-economic factors. Trade agreements that allow to coordinate national policies that have cross-border spillover effects. As a result, when these spillovers are stronger, such as in the case of economies heavily involved in global value chains, we observe deeper forms of integration. But rules in trade agreements can also be influenced by political economy forces, such as lobbying by large corporations. Thus, specific provisions in DTAs may serve the purpose of special interests in a country rather than the general interest.

- The economic effects of DTAs are shaped by the individual policy areas and specific provisions in the agreement. The inclusion of rules on antidumping and countervailing duties in DTAs limits the use of these measures vis-à-vis members; opening services increases trade in goods that heavily rely on services; the inclusion of policy areas that increase competition is associated with lower firms' markups, etc. Within these policy areas, specific provisions, such as the ones that are enforceable and go beyond what countries agree in the context of the WTO, are often found to be driving the trade effects of DTAs.

- DTAs have heterogeneous effects within countries. Beyond the standard distributional implications of trade integration, specific rules in trade agreements do have asymmetric effects. Regulatory provisions in DTAs tend to reduce the fixed costs created by non-tariff measures and thus increase the exports of regulatory-intensive sectors. Because small exporters have a harder time paying those costs, they also tend to benefit more from these provisions in DTAs. Similarly, trade facilitation provisions reduce fixed entry costs in foreign markets. This favours trade of firms involved in global value chains that import and export and thus bear a larger amount of those costs.

- DTAs can have positive spillover effects on non-members. Preferential tariffs increase discrimination between members and non-members of a trade agreement. But DTAs include several policy areas that are non-discriminatory in nature and can thus reduce trade costs for members and non-members alike. Indeed, rules that increase competition, limit domestic subsidies, and regulate

state-owned enterprises in members' markets are found to increase (rather than reduce) exports of non-members. Even in policy areas where preferences can be granted, such as public procurement, there are specific provisions that are de facto non-discriminatory and have positive spillovers on non-members' producers.

- Non-trade policy areas in DTAs can affect both trade and non-trade outcomes. The trade effects of non-trade policy areas can be subtle and non-obvious. Countries that sign up to stronger rules on intellectual property rights protection tend to experience increases in exports of sectors such as biopharmaceuticals, most likely as they are better able to attract multinationals in these sectors. The relationship between labour clauses and trade volumes is generally negative but depends on the type of clauses in DTAs. Environmental provisions are effective in limiting the negative impact of trade agreements on deforestation, particularly as they limit incentives for agricultural extensification.

- DTAs may play a large role in shaping trade in the post-COVID-19 world, leading to more fragmentation. The pandemic could lead to old and new trade measures, many of a protectionist nature. Governments may be tempted to use trade restrictions to redirect demand towards domestic production or to resort to regulatory protectionism to deal with rising aversion to various risks, such as health, security, and privacy. In this context, DTAs may shield and promote trade between members while directing protectionist pressures towards non-members. The result could be a more fragmented world. The revival of meaningful multilateralism is needed to complement deep trade agreements in a post-COVID-19 world.

ORGANISATION OF THE E-BOOK: FIVE QUESTIONS (PLUS ONE) ON DEEP TRADE AGREEMENTS

The eBook is divided into five sections covering different questions on the economics of deep trade agreements and a concluding chapter on how DTAs may shape global trade in a post-COVID-19 world.

1. What is the economic impact of deep trade agreements? The chapter by Goldberg and Reed studies how DTAs affect market size and how this scale effect may in turn impact poverty. The chapter by Fontagné, Rocha, Ruta and Santoni compares the trade and welfare effects of signing new trade agreements with the effects of deepening existing ones. Finally, the chapter by Breinlich, Corradi, Rocha, Ruta, Silva-Santos and Zylkin focuses on methodological innovations to quantify the trade effects of complex trade agreements involving multiple policy areas and commitments.

2. What are the political economy determinants and design issues of DTAs? The chapter by Blanga-Gubbay, Conconi, Kim and Parenti documents the role of firms, especially large corporations, in influencing the content of deep trade agreements. The chapter by Baccini, Fiorini, Hoekman, Altomonte and Colantoni studies how global value chains shape the membership of PTAs and the policy areas and commitments they include. Finally, the chapter by Crowley, Han and Prayer investigates the role of DTAs in expanding market size and competition and thus reducing firms' market power.

3. What is the role of DTAs in regulating border and behind-the-border restrictions to trade? The chapter by Prusa and Zhu focuses on the rules on antidumping in DTAs and studies how these rules affect the duration of antidumping protection between members and relative to non-members. The chapter by Lee, Rocha and Ruta investigates how trade facilitation procedures impact firms' participation in global value chains focusing on the case of Peru. Finally, the chapter by Fernandes, Lefebvre and Rocha examines the role of SPS and TBT provisions in deep agreements for firm exports in Chile, Colombia, and Peru, emphasising heterogeneity across firm size.

4. What is the role of services and state support provisions in deep trade agreements? The chapter by Borchert and Di Ubaldo studies the impact of specific services rules on trade and global value chain relationships. The chapter by Mulabdic and Rotunno assesses the importance of trade barriers in government procurement and identifies the impact of trade agreements on cross-border flows. Finally, the chapter by Lefebvre, Rocha and Ruta studies how provisions regulating state-owned enterprises in DTAs can have a spillover effect on non-members focusing on the case of China.

5. What is the impact of (selected) non-trade areas in trade agreements? The chapter by Maskus and Ridley studies the trade effects of PTAs with standards of intellectual property protection that go beyond the rules set in the WTO agreement. The chapter by Robertson investigates the heterogeneous effects that labour provisions, such as rules on the freedom of association or forced and child labour, have on international trade flows. The chapter by Abman, Lundberg and Ruta combines detailed satellite data on deforestation with information on environmental provisions in DTAs that aim at protecting forestry resources and biodiversity, to evaluate the effectiveness of these rules to achieve environmental goals.

The final chapter by Mattoo, Rocha and Ruta relies on the DTA database to analyse the role of deep trade agreements in a post-COVID-19 world. While these authors argue that DTAs will continue to shape global trade in the aftermath of the pandemic, they flag the risk that DTAs may be more discriminatory than in the past, and that this discrimination may hurt more developing countries.

CONCLUSION

The overarching message of the new body of research in this eBook is that the rules and commitments contained in DTAs matter for economic development as they are important determinants of international trade patterns, global value chain integration, and welfare. Relative to previous studies on the impact of trade agreements, this body of research emphasises the role of specific policy areas and provisions in affecting trade and non-trade outcomes. These findings support the view that rules and commitments in trade agreements bear consequences. Economists, policymakers and anyone interested in trade and development should pay close attention to the content of DTAs – the devil is in the details.

In this evolving area of research, future work will need to proceed along three avenues. First, there is a need to continue data collection. In the last two years (May 2019-2021), there have been more than 60 new trade agreements notified to the WTO. Roughly half of this increase is due to the UK replacing EU agreements with new bilateral arrangements, but even net of this Brexit effect the surge is significant. Second, there is a need to invest more effort in new methods. Several chapters in this eBook have innovative approaches such as the adoption of machine learning and clustering methods to quantify the impact of DTAs. But the authors also make clear the limitations of these methods. Third, there is a need to explore new areas. Provisions in policy areas such as digital trade may become much more important in the future. DTAs can have relevant effects beyond what we study here – Intellectual property rules may affect innovation, investment rules can impact Foreign Direct Investment (FDI), migration rules matter for labour mobility, etc. This eBook is clearly only a first step to better understand the welfare effects and efficient design of DTAs.

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THE ECONOMIC IMPACT OF DEEP TRADE AGREEMENTS

CHAPTER 1

The enduring role of international integration in development

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Many of the success stories of economic development in the past century coincided with growth in exports and trade surpluses, especially in East Asia (Stiglitz 1996). Advances in technology, however, threaten the comparative advantage offered by cheap labour. Moreover, protectionism is now on the rise in advanced economies, imperilling the relevance of the export-led model. This observation has led policymakers to ask: what is the pathway to development in a world with less international integration?

Intuitively, the answer seems to be that developing countries need to rely more on themselves. This path seems more attainable for 'large' countries such as India. For example, even if India traded less with other countries, it could still rely on its own market; there could be a lot of trade, but trade would be internal rather than external. However, 'small' countries may not have such an option.

This simple intuition raises several questions: what does 'large' mean? Is size defined in terms of population, income, or geographic area? What is the mechanism through which size leads to development? How 'large' (as defined by an appropriate metric) does a country need to be to break into development? And what are the options available to countries that do not make the cut based on their size? In our paper, we try to answer these questions by formalising the above intuition within an economic framework that emphasises the role of demand-side constraints in national development (Goldberg and Reed 2020).

We define 'development' as sustained poverty reduction, measured as a continuous decline in the share of the population living on less than $1.90 PPP per day in 2011 US dollars, over a five-year period. While many indicators summarise a country's progress, poverty reduction is arguably the best indicator that a country is on track to becoming what could be called an advanced economy. Poverty elimination is the first of the World Bank's twin goals and the first of the UN Sustainable Development Goals.

Our focus on the transition between two dichotomous stages of development, one with extreme poverty and one without, follows in the tradition of W. Arthur Lewis' work (Lewis 1953, 1954) and its formalisation by Murphy et al. (1989). In this framework, the economy has two alternative production technologies: one with constant returns to scale and another with increasing returns to scale. Development takes place when firms pay

the fixed setup costs of adopting the increasing returns technology, which causes labour productivity to rise. The main implication of this framework is that a minimum efficient scale – a threshold market size – is required to achieve development (if there is not enough demand, a firm adopting the increasing-returns technology will not break even).[1]

DERIVING THE THRESHOLD MARKET SIZE

One way to achieve minimum efficient scale is through access to international markets (Helpman and Krugman 1985). In principle, however, a large enough domestic market could also allow firms using the increasing returns technology to break even. The specific mechanism involves an initial positive wealth shock, from either agricultural productivity or exports. Societies develop faster when this new wealth is distributed more equitably across the population, and the resulting consumption by the middle class is large enough to achieve the minimum efficient scale. These ideas imply that the threshold market size could be achieved through various combinations of (i) a large population, (ii) an equitable distribution of income, and (iii) a large international market.

To implement this framework empirically and derive the threshold market size, we draw on the industrial organisation literature; specifically on Bresnahan and Reiss (1991), who develop a method to estimate entry thresholds based on the profit functions of firms facing increasing returns and entering imperfectly competitive markets.

We model market size as a function of observables. The size of a given country's integrated international market is calculated by summing the population and income of all other countries, where those countries are weighted by the number of economic integration provisions a country has signed with them. The size of the domestic market is measured as a function of the income distribution, i.e. by the share of the population in the global middle class, defined based on Kharas (2017) to include those living on $11–110 PPP per day in 2011 US dollars. The use of an absolute, rather than relative, definition for the middle class reflects the assumption that the increasing-returns technology is the same across countries. The empirical model also accounts for other factors that have been shown to impact development, most important of which are geography and institutions which affect firms' fixed costs of market entry. Setting the size of the integrated international market to zero in a counterfactual scenario allows us to isolate the effect of domestic market size alone on sustained poverty reduction. This exercise quantifies the hope for development in a less globally integrated economy.

THE ECONOMICS OF DEEP TRADE AGREEMENTS

1 Banerjee and Duflo (2005) propose a similar model of development in which firms choose to upgrade to a new technology, but emphasise the role played by capital market imperfections in prohibiting the adoption of this technology.

INTERNATIONAL INTEGRATION AND MIDDLE CLASS ARE KEY

We estimate the threshold market size for sustained poverty reduction to be 328 million people, if the purchasing power of these people is below that of the global middle class. This implies that if threshold market size were based on raw population alone, only three countries in the world (China, India, and the US) would be large enough to achieve poverty reduction without international integration and without a middle class.

Of course, in our framework, threshold market size depends not only on raw population, but also on international integration and the size of the middle class. A small country that is internationally integrated may effectively have access to a much larger market. Similarly, a small country with a large fraction of its population in the global middle class may have high enough consumption to support development. Our estimates have three main implications:

1. International integration is important, especially when a country integrates with richer countries. To understand the implications of our estimates, consider a hypothetical situation concerning Afghanistan, with a population of approximately 35 million. Suppose Afghanistan contemplates integrating with one of its neighbours: either Pakistan, with a population of 200 million, or Iran, with a population of 80 million. According to our estimates, opening to an integrated market of the same population adds the equivalent of 160,000 people to the average market size. The multiple of this would be greater if the country integrated with Pakistan. However, income per capita is more important than population size. Joining a market with the same relative income per capita is equivalent to 20 million people on average in our sample. Pakistan, which has a three-times-greater income per capita than Afghanistan, would be worth an additional 60 million people. However, Iran has income per capita ten times larger than Afghanistan, and so integration would yield the equivalent of 200 million more people. In this example, Iran is a much more valuable market when one accounts for population and income. Though there are gains to having a large market in terms of population, the main incremental value comes from trading partners' purchasing power. This suggests that the so-called South-South integration between countries of similar incomes will be less valuable than North-South integration between countries of different incomes.

2. The middle-class share also has a positive and significant effect on sustained poverty reduction. For the average country in our sample, increasing the share of the population in the global middle class by 10% is equivalent to increasing population by 54 million people.

3. In a scenario in which the size of the integrated international market is set to zero, as of 2011–2015, the average resident of a low- and lower-middle-income country does not live in a market large enough to experience sustained poverty reduction. The primary reason for this is that the middle class in these countries is not yet large enough.

FIGURE 1.1   AVERAGE MARKET SIZE BY INCOME
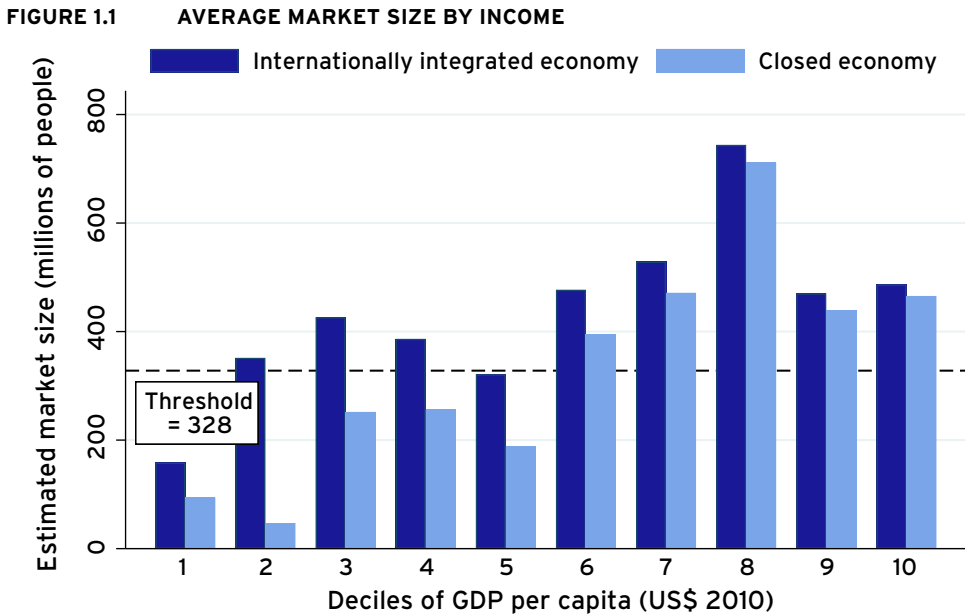
Source: Goldberg and Reed (2020).

Figure 1.1 summarises this insight. It reports estimated market size, averaged over deciles of GDP per capita, using only data from 2011–2015 and weighting observations by population. The dark blue set of columns correspond to the open economy (at current levels of integration). The light blue columns show a market size determined only by population and the size of the middle class. Notably, in this closed economy scenario, it is not until the sixth decile of GDP per capita (which corresponds to $2,417) that the market becomes large enough to meet the estimated threshold of 328 million people. The figure once again demonstrates the importance of international integration. In all except the first and fifth deciles, the open economy market size is, on average, greater than the threshold. This suggests that, if international integration remains as in the past, most countries should be able to achieve sustained poverty reduction. The average market size of the open economy, however, does not go far above the threshold.

AMIDST DEGLOBALISATION, DEVELOPING COUNTRIES NEED MORE EQUALITY WITHIN THEIR BORDERS

Our results suggest that international integration has, in the past, provided a pathway for poor countries to eliminate poverty. If international integration becomes less tenable in the future, to eliminate poverty, policymakers in poor countries would need to focus on equalising the distribution of income, for instance through taxation or (as suggested by the model underlying our paper's analysis) redistribution of equity shares to the poor in order to create a middle class that is large enough to foster development. For countries with small populations, such equalisation is disproportionately important.

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CHAPTER 2

Quantifying the impact of deep trade agreements: A general equilibrium approach

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Should regions focus their negotiating energy on signing a plethora of new preferential trade agreements (PTAs) or should they engage in deepening existing ones? What would be the impact on trade and GDP if all countries in a region simultaneously deepened their PTAs? Or if they signed new agreements with regional and non-regional partners? Most of the existing trade literature is ill suited to addressing these questions. Typically, empirical studies focus on the partial trade impact of preferential trade agreements (see Limão 2016 for a survey). Systemic changes in the structure of trade agreements, however, will have broader (i.e. general equilibrium) effects. In a recent paper (Fontagné et al. 2021), we develop a general equilibrium approach to assess the economic impact of PTAs and provide a first answer to these broad research questions and an application to Latin America and Caribbean (LCR) countries.

Typically, a PTA will reduce trade cost between signing parties and possibly increase the relative trade cost of the signing countries vis-à-vis third countries. The precise nature of provisions contained in the agreements determines the outcome. For instance, competition policy, by allowing foreign competitors to benefit from a level playing field, should have more trade-creation and less trade-diversion effects compared to a simple phasing out of tariffs among members of the PTA. Alternatively, a provision on government procurement might facilitate trade between members of the agreement but increase trade costs vis-à-vis third countries that do not receive the same access to members' public procurement markets. The bottom line is that PTAs differ in their ambition and thus have an uneven impact on trade (Baier et al. 2019).

Mattoo et al. (2017) build on Baldwin (2014) and point out that the depth (or content) of trade agreements matters for third-country effects: deep agreements lead to more trade creation and less trade diversion than shallow agreements. Some provisions are purely discriminatory, while some others (e.g. subsidies, competition) do not discriminate between members and non-members of a PTA. Therefore, some provisions will reduce trade costs between members and increase trade costs to non-members, while others can reduce trade costs for both members and non-members. Only by considering a general equilibrium framework can one tackle these differentiated impacts on parties and third countries.

In short, a proper quantification of the trade effects of PTAs requires (i) controlling for the depth of trade agreements, meaning the ambition of PTAs in terms of provisions they contain; and (ii) using a theoretically consistent estimation framework.

CLUSTERING TRADE AGREEMENTS

The first step of the analysis is to define statistically significant groupings of PTAs based on their content. In our recent paper, we rely on an exhaustive description of the provisions included in PTAs based on the new World Bank Deep Trade Agreement database (Mattoo et al. 2020). We use information on all policy areas (except tariffs) encompassing objectives, substantive commitments, and enforcement procedures present in legal texts, and available annexes of the 278 PTAs in force and notified to the WTO up to 2017.

The high dimensionality of the underlying information requires that we group detailed provisions into categories, assess the ambition of each category in each agreement, and finally group agreements according to similarity in the ambition of the categories of provisions they contain. The 278 trade agreements signed between 1980 and 2017 and that are currently in force and notified to the WTO contain 906 provisions, grouped into 18 categories. Using a state-of-the-art classification algorithm (Arthur and Vassilvitskii 2007), we end up with three 'clusters' of PTAs. With these three groups of agreements, the distance between observations within each group of PTAs is minimised and the distance between groups is maximised.

ASSESSING THE EFFECTS OF DEEP TRADE AGREEMENTS

The next task is to estimate the trade impact of each category of PTAs. We derive a trade cost function taking stock of our clustering of agreements. Here again, we let the data speak and estimate what is the mean impact of belonging to a PTA positioned in a certain cluster. We control for the right benchmark in terms of trade cost, namely domestic trade – meaning that we embark internal trade flows in our estimation of the trade effects of the different types of PTAs. This confirms the accuracy of our clustering: the three groups have a statistically different impact on trade, and we name them with the mnemonics 'deep', 'medium' and 'shallow' according to their decreasing impact on trade. Figure 2.1 represents agreements of the three types in the cluster space.

The last step of the analysis is quantifying the trade and welfare impacts of counterfactual PTAs. Since we know what the impact of different clusters of signed PTAs on trade is, we can assess the economic consequences not only of signing new agreements (the extensive margin of regional integration) but also of deepening existing ones (respectively, the intensive margin). To illustrate our approach, we focus on LCR countries. In order to trace the effects of deepening and widening PTAs, we follow the general equilibrium approach used by Yotov et al. (2017) and Fontagné and Santoni (2021), here amended to account for the depth of agreements.

FIGURE 2.1   CLUSTER SPACE
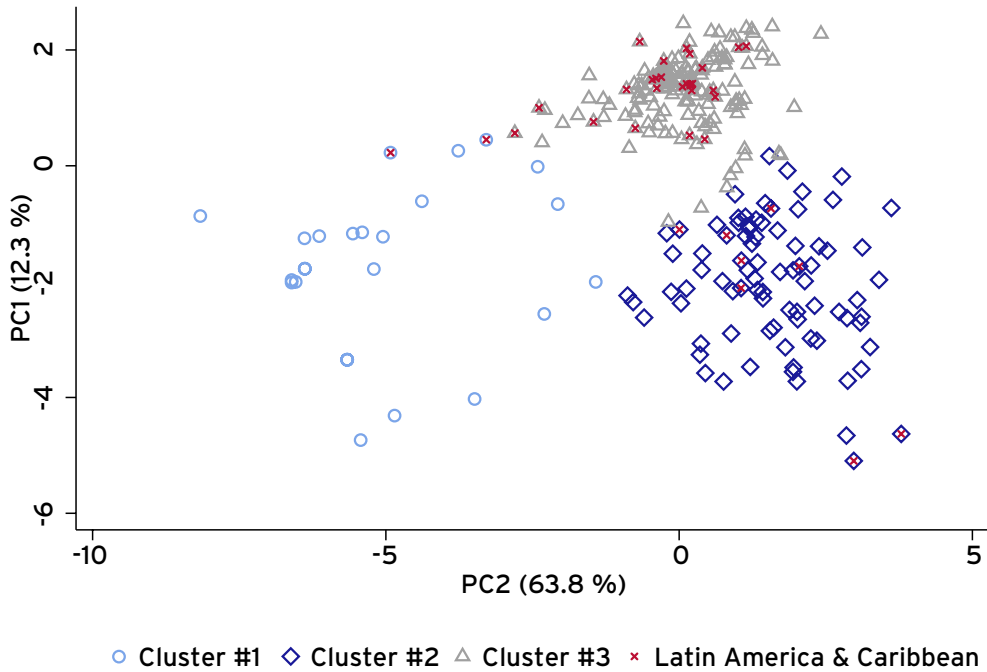
Notes: Spatial representation of the three clusters. Each point represents a trade agreement; x-axis and y-axis are defined using the first two principal components of the 18 features used by the clustering algorithm, centred on zero. Circles: deep PTAs; diamonds medium PTAs; triangles: shallow PTAs. Red crosses: PTAs signed by LCR countries.

MORE VERSUS DEEPER TRADE AGREEMENTS IN LATIN AMERICA

Let us now consider the network of agreements signed by the LCR countries. LCR countries record 36 agreements within the region, classified as follows: two are 'deep' (Andean Community, Peru-Mexico); eight are 'medium'; and 26 are 'shallow'. With respect to the rest of the world, LCR countries are engaged in 61 agreements, four of them classified as deep (NAFTA, Canada-Chile, EFTA-Chile, Chile-Japan); 27 medium; and 30 shallow.

We first assume that the existing PTAs involving LCR countries became as deep as those of the highest ambition. Table 2.1 shows the results for this intensive margin of policy integration for a selection of countries and for the LCR region as a whole. As expected, intensifying cooperation enhances trade among participating countries, with only marginal diversion from countries in the 'rest of the world' and Barbados, and thus their total trade.

TABLE 2.1 GENERAL EQUILIBRIUM EFFECTS OF DEEPENING REGIONAL INTEGRATION IN THE LCR REGION AT THE INTENSIVE MARGIN (YEAR 2017)

Country name	Within LCR		Within LCR plus RoW	
	△Export (1)	△GDP (2)	△Export (3)	△GDP (4)
Argentina	6.20	0.82	8.35	1.11
Barbados	-0.19	-0.06	2.19	0.67
Brazil	3.56	0.18	5.81	0.28
Chile	2.86	0.62	13.78	3.15
Colombia	8.58	0.43	19.68	0.99
Mexico	0.24	0.32	0.92	2.12
LCR	1.96	0.31	4.44	1.01
RoW	-0.02	0.00	0.08	0.01

Notes: The table shows the results for a selection of countries in the region, for the region as a whole (LCR) and for the rest of the world (RoW). Changes are in percentage deviation from the reference situation for total exports of the affected countries and GDP of these countries. The first panel 'within LCR' describes the deepening of agreements involving only countries in the region, while the second panel describes the impact of deepening agreements between LCR countries and the rest of the world.

TABLE 2.2 GENERAL EQUILIBRIUM EFFECTS OF SIGNING NEW AGREEMENTS (WITH DIFFERENT LEVELS OF AMBITION) WITHIN THE LCR REGION (YEAR 2017)

Country name	Within LCR, deep		Within LCR, middle		Within LCR, shallow	
	△Export (1)	△GDP (2)	△Export (3)	△GDP (4)	△Export (5)	△GDP (6)
Argentina	0.28	0.03	0.14	0.02	0.12	0.01
Barbados	7.96	2.59	4.10	1.32	3.45	1.11
Brazil	0.30	0.02	0.16	0.01	0.13	0.01
Chile	0.04	0.01	0.02	0.00	0.02	0.00
Colombia	1.55	0.08	0.81	0.04	0.68	0.03
Mexico	0.02	0.02	0.01	0.01	0.01	0.01
LCR	0.29	0.05	0.15	0.03	0.13	0.02
RoW	0.00	0.00	0.00	0.00	0.00	0.00

Notes: The table shows the results for a selection of countries in the region, for the region as a whole (LCR) and for the rest of the world (RoW). Changes are in percentage deviation from the reference situation for total exports of the affected countries and GDP of these countries. The first panel 'within LCR, deep' describes the signature of deep agreements involving only countries in the region. The second and third panels show the result of signing respectively new agreements of medium and shallow ambition.

The last step is to quantify the economic impact of the extensive margin of integration among LCR countries. We simulate the effect of ratifying all the vacant agreements within the LCR region at different levels of integration. Practically, this second counterfactual exercise evaluates the expected gains of signing the remaining 60% of bilateral agreements. Table 2.2 shows the results. Here, small LCR countries signing with large countries in the region see their trade (and GDP) greatly increase, through forces of gravity. Barbados is the extreme example of such a country, and the more so because the ambition of the signed agreement is high.

CONCLUSION

In this chapter, we illustrate a new method to quantify the economic impact of PTAs based on our recent work (Fontagné et al. 2021). The method allows us to take into account the differing depth of trade agreements as well as their general equilibrium effects. We then use this approach to ask whether LCR countries would benefit more from signing new PTAs or from deepening existing ones. One can draw two important conclusions from this exercise. First, using an average effect of PTAs, disregarding the depth of trade agreements, is misleading when quantifying the economic impact of regional integration. Second, as illustrated with the example of LCR countries, focusing negotiation resources on deepening existing PTAs is more promising than signing new ones.

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CHAPTER 3

Using machine learning to assess the impact of deep trade agreements

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Preferential trade agreements (PTAs) have become increasingly complex in recent decades, making it difficult to assess how they impact trade and economic activity. Modern PTAs contain a host of provisions besides tariff reductions, in areas as diverse as services trade, competition policy, or public procurement. To illustrate this proliferation of non-tariff provisions, Figure 3.1 shows the share of PTAs in force and notified to the WTO up to 2017 that cover a number of selected policy areas. For example, the figure shows that close to 60% of recently signed PTAs included provisions related to technical barriers to trade.

FIGURE 3.1   SHARE OF PTAs THAT COVER SELECTED POLICY AREAS
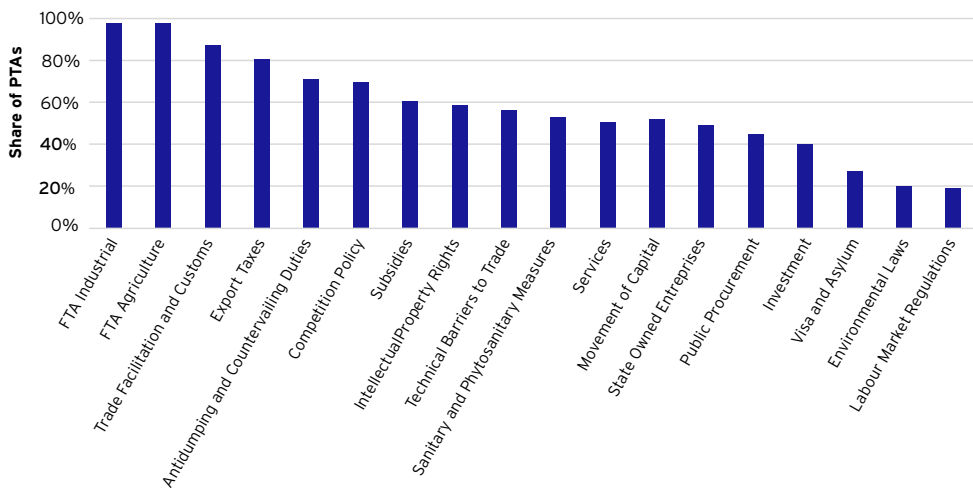
Source: Hofmann et al. (2019).

Against this background, researchers and policymakers interested in the effects of PTAs face difficult challenges. In particular, recent research has tried to move beyond estimating the overall impact of PTAs on trade and to establish the relative importance of individual PTA provisions (e.g. Kohl et al. 2016, Mulabdic et al. 2017, Dhingra et al. 2018, Regmi and Baier 2020). However, such attempts face the difficulty that the number

of provisions included in PTAs is very large compared to the number of PTAs available to study (see Figure 3.2), making it difficult to separate out their respective effects on trade flows. Intuitively, if we observe increases in trade flows between two countries after they have implemented a PTA, we cannot tell which of the many provisions included in that agreement is responsible for the increase.

FIGURE 3.2   THE NUMBER OF PROVISIONS IN PTAS OVER TIME
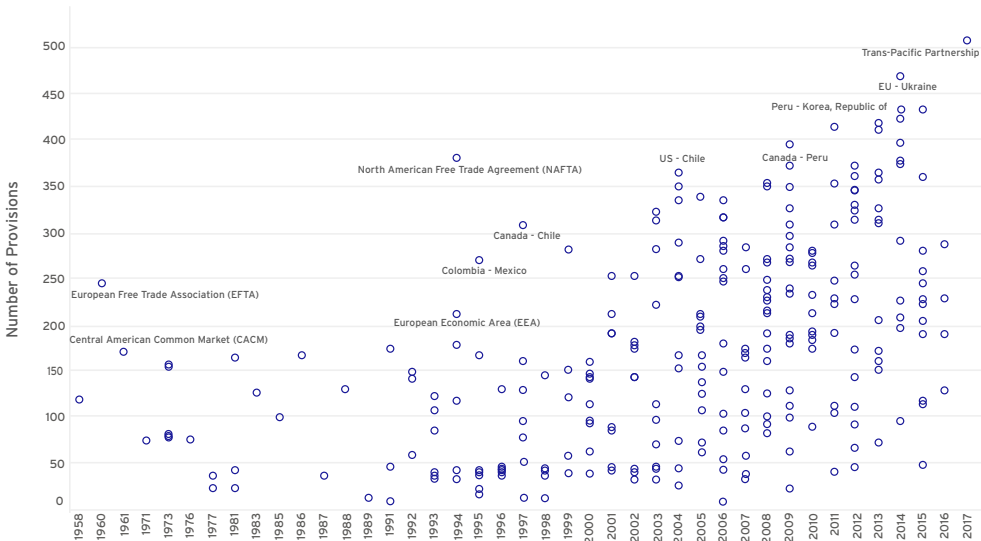
Source: Mattoo et al. (2020).

Researchers have tried to address the growing complexity of PTAs in different ways. For example, Mulabdic et al. (2017) use the count of provisions in an agreement as a measure of its 'depth' and check whether the increase in trade flows after a given PTA is related to this measure. Dhingra et al. (2018) instead group provisions into categories (such as services, investment, and competition provisions) and examine the effect of these "provision bundles" on trade flows. Obviously, both approaches come at a cost. Simply counting the number of provisions in an agreement implicitly assumes that all provisions are of equal importance in increasing trade flows and prevents us from learning about the effects of individual provisions. Likewise, bundling provisions into groups precludes researchers from estimating the effect of individual provisions within each group.

A NEW METHODOLOGY

In recent research (Breinlich et al. 2021), we instead propose to adapt a technique from the machine-learning literature – the so-called least absolute shrinkage and selection operator (Lasso) – to the context of PTAs. To understand how Lasso works, it is best to first look at how more traditional approaches work.

Traditional approaches try to estimate the impact of individual provisions by trying to accurately fit the effects of PTAs that have already been implemented. For example, if we observe that PTAs that contain provision A are always associated with large increases in trade flows, traditional approaches will conclude that provision A has a large impact on trade flows. This approach works well when we only have a small number of provisions whose effects we want to estimate, or when we have a large number of PTAs that we can study. However, if the number of provisions is large compared to the number of PTAs, this approach will run into difficulties.

For example, consider the case where we are trying to learn about the impact of two provisions on trade flows, but we only observe a single PTA in our data and it includes both provisions. We would then be unable to tell which of the two provisions causes the observed increase in trade flows. If, by contrast, we observed two PTAs, each of which only contains one of our two provisions, we would again be able to estimate their effect by comparing the trade-flow increase following each PTA and attribute that increase to the provision that was included in the corresponding PTA.

The key point in this example is that if the number of provisions is large relative to the number of PTAs, traditional methods run into problems. The machine-learning literature has tried to address this problem by using statistical approaches that restrict the number of variables that can be included to predict the effects of PTAs. Going back to our example, if we knew that the effect of one of our two provisions on trade flows was zero, we would be able to estimate the effect of the other provision even if we only had one PTA to work with. The same basic intuition also applies to the more complex case we face in reality, where we have many provisions but only a small number of PTAs. As with traditional approaches, the method we apply in our paper tries to fit the effects of existing PTAs but effectively limits the number of provisions that are allowed to have non-zero effects on trade flows, making it easier to identify the effect of the remaining provisions. More precisely, we adapt the 'rigorous Lasso' method of Belloni et al. (2016), which works by shrinking the effects of individual provisions towards zero and progressively removing those that do not have a significant impact on the fit of the model. Our methodological contribution is to combine this approach with the latest econometric best practices that are used by empirical trade researchers studying trade agreements (see, for example, Yotov et al. 2016 and Weidner and Zylkin 2020).[1]

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[1] Our approach complements the one adopted by Regmi and Baier (2020), who use machine-learning tools to construct groups of provisions and then use these clusters in a gravity equation. The main difference between the two approaches is that Regmi and Baier (2020) use what is called an unsupervised machine-learning method, which uses only information on the provisions to form the clusters. In contrast, we select the provisions using a supervised method that also considers the impact of the provisions on trade.

RESULTS AND CAVEATS

To illustrate this further, consider the specific data situation we are facing. We are using the World Bank's database on deep trade agreements, in which we observe 305 'essential' provisions and 283 PTAs.[2] By eliminating provisions that are not associated with strong increases in trade flows, our approach makes this problem manageable. Specifically, our technique selects six provisions more strongly associated with increasing trade flows following the implementation of the respective PTAs. These provisions are in the areas of antidumping, competition policy, technical barriers to trade and trade facilitation. The first two rows of Table 3.1 list these provisions, as well as their estimated impact on trade flows. The selected provisions limit the use of antidumping duties (AD 14), require transparency in competition policy processes (CP 23), promote the use of international standards (TBT 07 and TBT 33), or lessen the administrative burden of complying with rules of origin and other customs procedures (TF 41 and TF 45).[3] For example, the results suggest that provision CP 23, which contains transparency requirements for the competition policy processes of member countries, is associated with an increase of bilateral trade by 4.7% when included in a PTA.

At this point, however, it is important to note that our approach does not fully resolve the difficulties discussed above, because the fundamental problem remains that we do not observe a large enough number of PTAs relative to the number of provisions used in these PTAs. Specifically, while our approach allows us to substantially narrow down the number of provisions associated with increases in trade flows, we cannot rule out the possibility that these provisions were only selected because they tend to appear in PTAs together with other provisions which are the real cause of the observed trade flow increase. Hence, we carry out a second step in which we check which of the provisions that were not selected before predict the ones selected, for example because they often appear together in PTAs. We call this approach the 'iceberg Lasso', because like an iceberg, of which only the tip is visible, our Lasso approach might select provisions which are only the tip of a much larger set of related provisions.

2   Essential provisions in PTAs include the set of substantive provisions (those that require specific integration/ liberalisation commitments and obligations) plus the disciplines among procedures, transparency, enforcement or objectives, which are required to achieve the substantive commitments (Mattoo et al. 2020).
3   For further information about these and other provisions, see Table 3.2

TABLE 3.1   PROVISIONS SELECTED BY LASSO AND CORRELATED PROVISIONS

AD 14	CP 23	TBT 07	TBT 33	TF 41	TF 45
(+41%)	(+4.7%)	(+11.2%)	(+4%)	(+73.3%)	(+8.2%)
AD 06	AD 06	AD 06	AD 06	AD 05	AD 11
(0.97)	(0.46)	(0.54)	(0.48)	(0.89)	(0.09)
AD 08	AD 08	AD 08	AD 08		CP 15
(0.97)	(0.46)	(0.54)	(0.48)		(0.73)
ENV 42	CP 22	ENV 42	AD 12		ET 03
(0.97)	(0.78)	(0.54)	(-0.11)		(0.51)
	CP 24	ENV 44	ENV 42		SUB 10
	(0.89)	(0.06)	(0.48)		(0.25)
	ENV 42	SPS 21	ENV 44		SUB 11
	(0.46)	(0.23)	(-0.01)		(0.28)
	ET 41	SUB 07	INV 24		TF 44
	(0.16)	(0.08)	(0.11)		(0.98)
	IPR 42	TBT 15	IPR 71		
	(-0.00)	(0.73)	(-0.08)		
	IPR 55	TBT 34	IPR 103		
	(-0.01)	(0.94)	(-0.11)		
	IPR 63		IPR 107		
	(-0.00)		(-0.12)		
	IPR 74		MOC 26		
	(-0.01)		(-0.10)		
	PP 08		SPS 21		
	(0.08)		(0.19)		
	SPS 21		SUB 04		
	(0.17)		(-0.11)		
	STE 31		SUB 07		
	(0.57)		(0.07)		
	TBT 02		TBT 05		
	(0.56)		(0.61)		
	TBT 15		TBT 06		
	(0.37)		(0.98)		
	TBT 29		TBT 15		
	(0.56)		(0.69)		
	TF 42		TBT 32		
	(0.56)		(0.61)		
	TF 44		TBT 34		
	(0.38)		(0.53)		

Notes: Table shows PTA provisions associated with increases in bilateral trade flows (row 1), together with the estimated increase in trade flows (row 2), as well as other provisions that predict the provision in row 1 (rows 3–20; numbers in brackets are raw correlations with the provision from line 1).

Source: Breinlich et al. (2021).

TABLE 3.2   CONTENT OF PROVISIONS

Provision code	Provision content
AD 05	Determination of dumping: Export price less than comparable price when destined for consumption in the exporting country
AD 06	Determination of dumping: If there are no sales in the normal course of trade in the domestic market of the exporting country
AD 08	Determination of dumping: Cost of production in the country of origin plus a reasonable amount
AD 11	Determination of dumping: Price effects of dumped imports
AD 12	Determination of injury: The consequent impact of dumped imports on the domestic industry
AD 14	Determination of injury: Requirement to establish material injury to domestic producers
CP 15	Does the agreement prohibit/regulate cartels/concerted practices?
CP 22	Does the agreement contain provisions that promote predictability?
CP 23	Does the agreement contain provisions that promote transparency?
CP 24	Does the agreement contain provisions that promote the right of defence?
ENV 42	Does the agreement require states to comply with the UN Conference on Environment and Development (UNCED)?
ENV 44	Does the agreement require states to comply with the International Energy Program?
ET 03	Prohibits new export quotas / QRs between the Parties
ET 41	Prohibits non-tariff measures related to export of goods
INV 24	Does the FET clause prohibit arbitrary, unreasonable or discriminatory measures?
IPR 42	Prohibits requiring the recording of a trade mark licence to establish licence validity or as a condition for use
IPR 55	Requires patent be made available for new processes of a known product
IPR 63	Requires a period of sui generis protection for patents
IPR 71	Requires system for protection of industrial designs
IPR 74	Seek to improve industrial design systems
IPR 103	Stipulates practices to be followed by collective management organisations
IPR 107	Patent Law Treaty (2000)

MOC 26	Does the transfer provision explicitly exclude 'good faith and non-discriminatory application of its laws' related to prevention of deceptive and fraudulent practices?
PP 08	Does the agreement contain explicit provisions on MFN treatment of third parties?
SPS 21	B. Risk Assessment: Is there reference to international standards/procedures?
STE 31	Does the agreement prohibit anticompetitive behaviour of state enterprises?
SUB 04	Does the agreement prohibit or regulate local-content subsidies?
SUB 07	Does the agreement introduce any ceiling to permitted subsidies?
SUB 10	Does the agreement include any specific regulation of fisheries subsidies?
SUB 11	Does the agreement include any specific discipline for public services?
TBT 02	B. Technical Regulations: Is mutual recognition in force?
TBT 05	B. Technical Regulations: Are there specified existing standards to which countries shall harmonise?
TBT 06	B. Technical Regulations: Is the use or creation of regional standards promoted?
TBT 07	B. Technical Regulations: Is the use of international standards promoted?
TBT 15	C. Conformity Assessment: Is the use of international standards promoted?
TBT 29	A. Standards: Is mutual recognition in force?
TBT 32	A. Standards: Are there specified existing standards to which countries shall harmonise?
TBT 33	A. Standards: Is the use or creation of regional standards promoted?
TBT 34	A. Standards: Is the use of international standards promoted?
TF 41	Does the agreement require customs harmonisation and a common legal framework?
TF 42	Does the agreement regulate customs and other duties collection?
TF 43	Does the agreement provide for the sharing of Customs revenue or another revenue distribution mechanism?
TF 44	Do trade facilitation provisions simplify requirements for proof of origin?
TF 45	Does trade facilitation provisions simplify procedures to issue proof of origin?

To illustrate the result of this procedure in our context, the third and subsequent lines of Table 3.1 report all provisions which were not selected by the Lasso in the first step but which are identified in the second step; we also report the correlation of each of these provisions with the selected provision in the first row. For example, we find that provision AD 14 is highly correlated with provisions AD 06, AD 08, and ENV42. The correlation with other antidumping provisions is not particularly surprising, as all three provisions (AD 14, AD 06, and AD 08) fulfil a similar purpose, which is to increase transparency and regulate the use of antidumping duties. While we cannot say which of these three provisions has the biggest effect, our results suggest that including provisions regulating the use of antidumping in PTAs should increase trade. The presence of an environmental provision (ENV 42), which requires members to participate in a UN environmental agreement, is more surprising and seems to be due to what might be called a 'template effect'. By this we mean the tendency of important trading blocs such as the EU and the US to use similar provisions in all their agreements. For example, most agreements signed by the EU include provisions on antidumping and the environment, hence leading to a high correlation between the corresponding provisions in our data.

Template effects may also be important for understanding the variables highly correlated with the selected technical barriers to trade (TBT) provisions, TBT 07 and TBT 33. Indeed, some of the same antidumping and environmental provisions that were found to be correlated with AD14 show up here as well (AD6, AD8, ENV42). That said, the strongest correlations in these cases are with other TBT provision such as TBT 06, TBT 15 and TBT 34, which is not surprising as these provisions also relate to the use of international standards. Thus, it seems likely that provisions encouraging the use of international standards in the area of technical barriers to trade are likely to be behind the trade increases associated with provisions TBT 07 and TBT 33, although we cannot say which of the individual TBT provisions is driving the observed effect.

The Lasso also selects two provisions that reduce the administrative burden resulting from compliance with rules of origin and other customs procedures (TF 41 and TF 45), which are estimated to have a very large trade-increasing effect (over 70% for TF 41). Also note that Table 3.1 indicates that trade facilitation (TF) provisions are correlated with some of the other provisions selected by the Lasso. This is true both for other trade-facilitating provisions (e.g. note the high correlation between TF 45 and TF 44) but also for some of the other provisions (e.g. note the correlation between CP 23 and TF 44). Thus, our results strongly suggest that trade-facilitation procedures related to rules of origins are associated with substantial trade flow increases.

Finally, we find that provision CP 23, which serves to promote transparency in competition policy, is correlated with some of the previously identified types of provisions, as well as with two further provisions on competition policy (CP 22 and CP 24). Thus, it seems likely that the presence of provisions on competition policy is behind the observed trade-increasing effect of CP 23, although we are again unable to say which provision exactly is driving this effect.

CONCLUSION

We have presented results from an ongoing research project in which we have developed a new method to estimate the impact of individual PTA provisions on trade flows. By adapting methods from the machine-learning literature to the context of PTAs, we have developed a data-driven method to select the most important provisions and quantify their impact on trade flows. While our approach cannot completely resolve the fundamental problem of the assessment of deep trade agreements, we were able to make considerable progress. In particular, our results show that provisions related to antidumping, competition policy, technical barriers to trade and trade-facilitation procedures are likely to enhance the trade-increasing effect of PTAs.

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POLITICAL ECONOMY AND DESIGN OF DEEP TRADE AGREEMENTS

CHAPTER 4

Lobbying on Deep Trade Agreements: How Large Firms Buy Favourable Provisions

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Recent decades have seen a proliferation of preferential trade agreements (PTAs). As shown in Figure 4.1, there are currently almost 350 PTAs in force.

FIGURE 4.1   NUMBER OF TRADE AGREEMENTS IN FORCE, 1948-2021
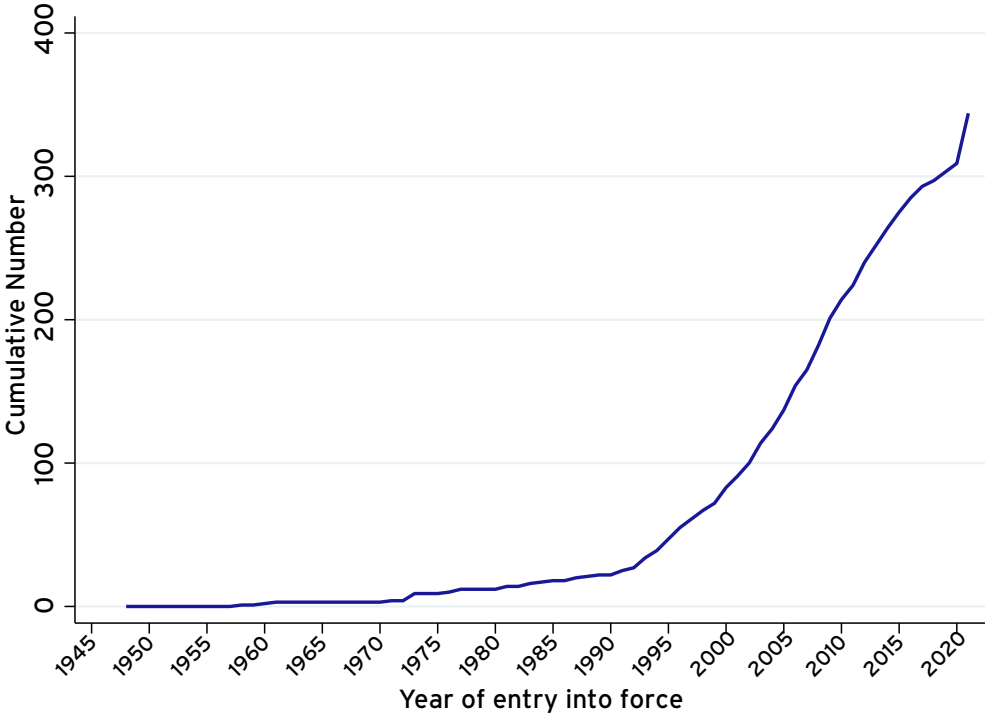
Source: WTO Secretariat.

Trade agreements have not only risen in number but have also become 'deeper' over time, often encompassing provisions that go beyond traditional trade policy. The final texts of the agreements contain detailed obligations on many non-tariff issues, e.g., rules on intellectual property rights, investment, labour and environmental standards, and sanitary and phytosanitary measures.

To illustrate the increase in depth of trade agreements, Rodrik (2018) compares US trade agreements with two small nations, Israel and Singapore, signed two decades apart. The US-Israel agreement, which went into force in 1985, is less than 8,000 words in length and contains 22 articles and three annexes, mostly devoted to trade issues such as tariffs, agricultural restrictions, import licensing, and rules of origin. By contrast, the US-Singapore agreement, which went into force in 2004, is nearly ten times as long, taking up 70,000 words and containing 20 chapters, more than a dozen annexes, and multiple side letters. Of its 20 chapters, seven cover conventional trade topics, while the others deal with behind-the-border topics. For example, provisions on intellectual property rights take up a third of a page (and 81 words) in the US-Israel agreement; they occupy 23 pages (and 8,737 words) plus two side letters in the US-Singapore agreement.

More systematic evidence on the depth of PTAs can be documented using the new World Bank dataset constructed by Mattoo et al. (2020), which codifies the provisions included in all trade agreements in force and notified to the WTO up to end of 2017. In particular, the dataset provides information on the coverage of 17 non-tariff issues that appear most frequently in trade agreements. Some of these deep trade issues are related to trade policies: Export Restrictions, Rules of Origin, Trade Facilitation and Customs, and Trade Remedies. Others concern non-trade policies: Intellectual Property Rights, Sanitary and Phytosanitary Measures, Technical Barriers to Trade, Public Procurement, Subsidies, Services Investment, Movement of Capital, Visa and Asylum, State Owned Enterprises, Competition Policy, Environmental Laws, and Labour Market Regulations.[1]

Using this dataset, we can measure the average depth of PTAs that have entered into force at different times. Figure 4.2 illustrates the increasing depth of the trade agreements negotiated in the last few decades. For each agreement, we average the coverage ratio of the 17 policy issues. We then average across trade agreements within a period.[2] Figure 4.3 illustrates the average depth of the 17 non-tariff policy issues across all agreements.

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1   For each policy issue, an expert designed a set of yes/no questions specific to that issue. A positive answer to each question indicates more depth. The analysis of the text of each agreement leads to a score equal to the number of positive answers to the questions related to the issue. Using this information, Mattoo et al. (2020) construct coverage ratios at the issue-PTA level, i.e., the share of positive answers to the questions related to the issue in each trade agreement.

2   We consider the European Union (EU) as a single entity (i.e., the European Union agreement and enlargements are excluded), but include PTAs between the EU and third countries. Notice that the average depth is higher for PTAs that have entered into force before 1995 than between 1995-1999. This is because the category of pre-1995 PTAs includes important trade agreements that contain many commitments on non-tariff provisions (e.g., NAFTA, Mercosur, EFTA).

FIGURE 4.2   AVERAGE DEPTH OF TRADE AGREEMENTS
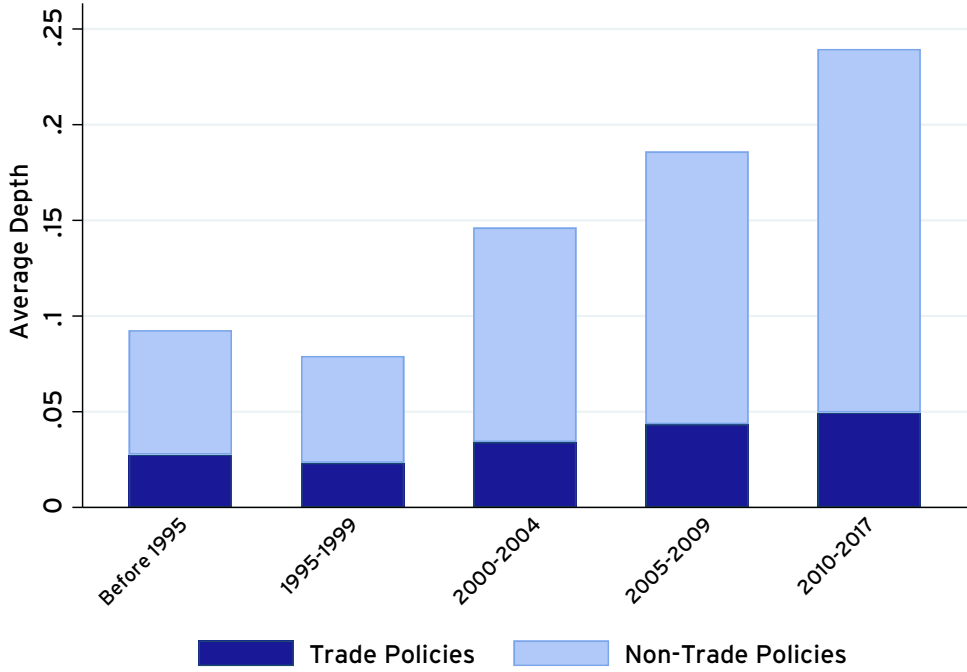
Source: World Bank dataset by Mattoo et al. (2020).

FIGURE 4.3   AVERAGE DEPTH OF TRADE AGREEMENTS, BY POLICY ISSUE
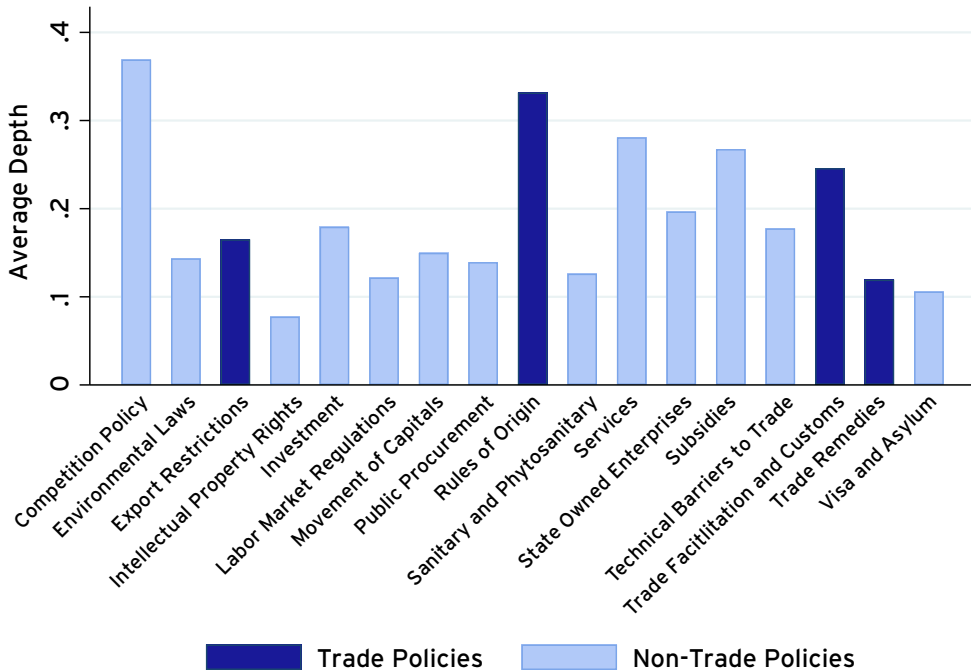
Source: World Bank dataset by Mattoo et al. (2020).

ARE DEEP TRADE AGREEMENTS SHAPED BY LARGE CORPORATIONS?

Rodrik (2018) argues that deep trade agreements are "the result of rent-seeking, self-interested behaviour on the part of politically well-connected firms – international banks, pharmaceutical companies, multinational firms". Concerns about the influence of powerful multinational corporations have also stirred strong public opposition to trade agreements such as the Comprehensive Economic and Trade Agreement (CETA) and the Transatlantic Trade and Investment Partnership (TTIP). Activists in the "Stop CETA and TTIP!" campaigns argued that "multinational companies – especially American ones – are trying to foist their wares on helpless European consumers" by including in the agreements provisions on investment dispute settlement, and on environmental, product, and labour standards that are favourable to them.[3]

Notwithstanding the heated academic and policy debates, little is known about whether the provisions contained in trade agreements reflect the interests of large corporations. In this paper, we study how lobbying by heterogeneous firms can shape the content of trade agreements.

To systematically examine lobbying by firms on trade agreements, we use detailed information from lobbying reports available under the Lobbying Disclosure Act (LDA) of 1995. These data have been used in several empirical studies on lobbying (e.g. Bombardini and Trebbi 2012, Blanes i Vidal et al. 2012, Bertrand et al. 2014, Ludema et al. 2018, Blanga-Gubbay et al. 2020), since they allow identification of the issues targeted by lobbyists.

We construct two datasets to study firm-level lobbying. The first builds on Kim (2018) and contains all lobbying reports filed by public firms and covers their lobbying expenditures on all policy issues (out of the 79 broad issues included in the LDA dataset). The second dataset contains all reports filed by public firms on the negotiation, ratification, and implementation of US trade agreements, as well as reports filed by the same firms lobbying on deep trade issues (out of the 17 non-tariff issues included in the Word Bank dataset). By combining these new datasets with Compustat, we can study which firms are politically organised, which policy issues they lobby on, and we can measure their lobbying effort on specific issues.

LARGE CORPORATIONS DOMINATE LOBBYING ON ALL POLICY ISSUES

We first examine firm-level lobbying on all policy issues. Table 4.1 lists the top 20 lobbying firms, ranked by their total lobbying expenditures.

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3   See "Fortress mentality: Protectionists and scaremongers are winning in Germany", *The Economist*, 15 September 2016.

TABLE 4.1   TOP 20 LOBBYING FIRMS

Company name	Lobbying Expenditure	Lobbying Reports	Number of Lobbying Issues
General Electric	768,88	3,771	59
Norfolk Southern	530,45	2,613	53
AT&T	495,42	2,566	58
Goodrich	395,18	2,377	54
Verizon	365,21	2,917	57
Boeing	353,52	1,385	46
Altria	338,90	1,649	52
United Parcel Service	333,99	1,550	49
Lockheed Martin	322,14	2,395	49
Northrop Gurmman	318,26	1,260	33
Wyeth (Pfizer)	317,26	1,513	43
Exxon Mobil	292,34	839	51
Amgen	272,81	1,846	32
Microsoft	256,06	1,546	44
FedEx	251,66	1,048	40
General Dynamics	241,70	1,607	35
General Motors	234,28	1,007	51
Oracle	231,04	2,440	59
Alphabet	202,45	974	32
Chevron	201,78	576	29

Notes: The table reports total lobbying expenditures (in millions of US dollars), number of lobbying reports filed, and number of Lobbying Disclosure Act policy issues lobbied on, for the top 20 lobbying firms.

Figure 4.4 shows the distribution of firms' log employment by the number of LDA policy issues lobbied. Notice that the smallest firms are not politically organised (i.e. do not lobby on any issue). Among lobbying firms, larger ones lobby on more policy issues.

FIGURE 4.4   FIRM SIZE AND NUMBER OF LOBBYING DISCLOSURE ACT LOBBYING ISSUES
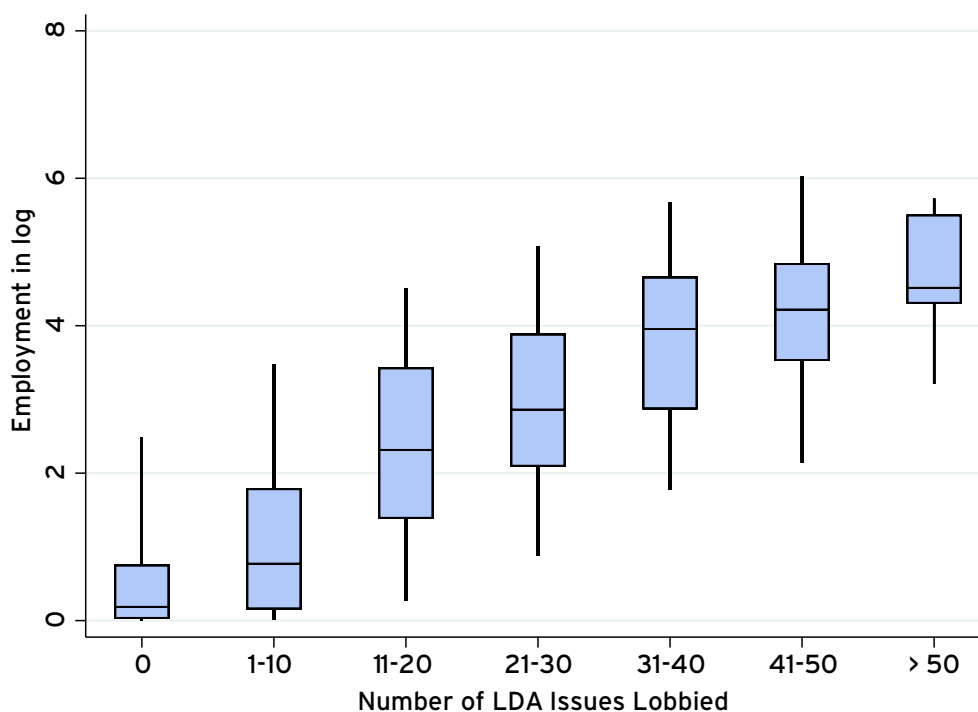
Notes: The figure plots the log of employment of non-lobbying firms (i.e., firms that do not lobby on any policy issue) and of firms that lobby on different numbers of LDA policy issues. Observations in each bin are winsorised at the 5th and 95th percentiles.

LARGE CORPORATIONS DOMINATE LOBBYING ON TRADE AGREEMENTS

We next study firm-level lobbying on trade agreements and provide strong empirical support for Rodrik (2018)'s argument that the politics of deep trade agreements is dominated by large corporations.

On the extensive margin, we find that only a few large firms lobby on trade agreements, and these companies tend to be multinationals and to operate in tradable sectors.

On the intensive margin, we find that larger firms spend more and file more reports lobbying on PTAs, and lobby on more agreements. Figure 4.5 shows a positive correlation between the size of lobbying firms and their lobbying expenditures on trade agreements.

FIGURE 4.5   FIRM SIZE AND LOBBYING EXPENDITURES ON TRADE AGREEMENTS
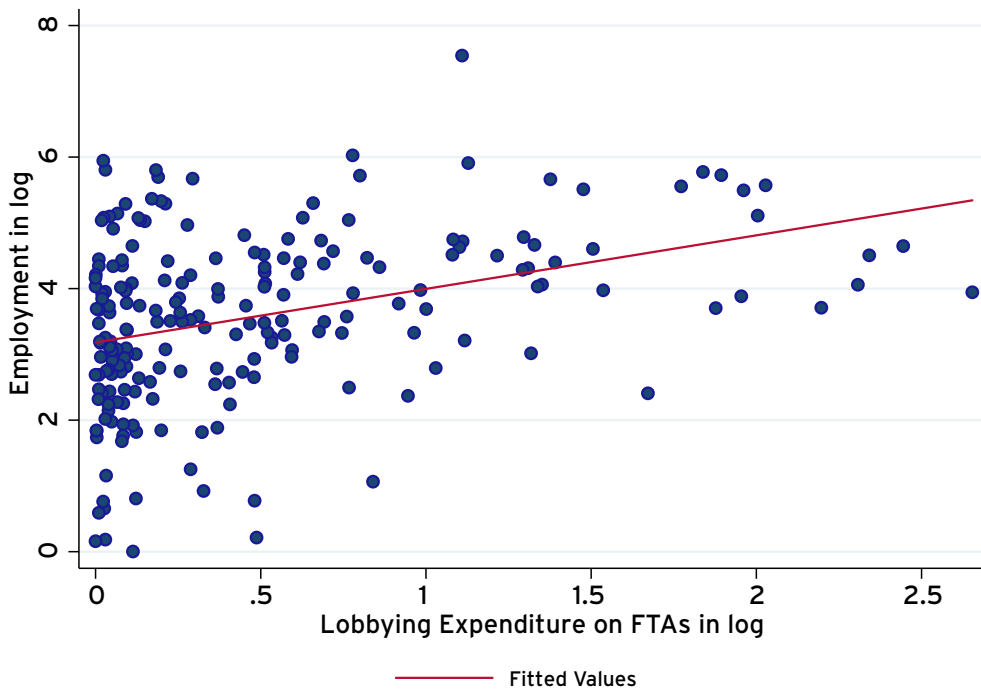
Notes: The figure plots the log of firms' lobbying expenditures on trade agreements against the log of their employment.

We also study firm-level lobbying on the deep trade issues covered in trade agreements. Many companies explicitly mention that they lobby to include specific provisions related to particular policy issues in the trade agreements.[4] In other cases, the company mentions the agreements it lobbies on, but not the specific issues. However, information from reports filed by the same firm can be used to infer the policy issues that the firm is interested in shaping when lobbying on trade agreements.[5] We find that larger firms lobby on more non-tariff issues covered in deep trade agreements.

A SIMPLE MODEL OF FIRM-LEVEL LOBBYING

We develop a model in which firms that are heterogeneous in productivity and product scope choose whether to be politically organised and lobby on provisions that are favourable to them.

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4   For example, in the second semester of 2007, Microsoft spent $4,220,000 lobbying on various policy issues. In the section of the report related to trade, the firm reports lobbying for the "passage of free trade agreements (US-Korea, US-Panama, US-Colombia, and US-Peru) and the inclusion of provisions of interest to the high-tech industry, including intellectual property rights as well as competition and market access issues". Notice that, at the time of the lobbying, the agreements with Colombia, Korea, Panama, and Peru were still under negotiation, so Microsoft could influence the provisions included in the trade agreement text.

5   For example, during the fourth quarter of 2008, Boeing spent $4,830,000 lobbying on various policy issues, including "support for Free Trade Agreements with Panama, Colombia, and Korea". In the same report, the company mentions lobbying on "export controls" and "trade-related aspects of climate change".

The model builds on the literature on firm heterogeneity in international trade, which emphasises selection effects in firms' decisions to export (e.g. Bernard and Jensen 1999, Melitz 2003), establish foreign subsidiaries (e.g. Helpman et al. 2004) and source inputs from foreign suppliers (e.g. Antràs et al. 2017). We follow models of multi-product firms (Eckel and Neary 2010, Bernard et al. 2010 and 2011, Mayer et al. 2014 and 2020) to examine how heterogeneity in productivity affects firms' scope and their incentives to lobby on multiple policy issues.

Firms must pay a fixed cost to be politically organised (e.g. to set up an in-house lobbying department). This allows them to lobby on multiple policy issues that may affect their products. Organised firms choose how much to spend lobbying to include in a bill provisions tailored to their products.

The model can rationalise our findings on the extensive and intensive margin of firm-level lobbying: only large multi-product firms should be politically organised; among lobbying firms, larger ones should spend more and lobby on more policy issues. In the benchmark model, each firm lobbies to include provisions (in a domestic bill or a PTA) that are specific to its products, with no effect on other firms. We show that allowing for free riding leads to stronger selection into lobbying, increasing the dominance of large firms.

CONCLUDING REMARKS

Our paper contributes to the literature on the political economy of trade agreements. Most studies in this literature focus on lobbying by industry groups (e.g. Grossman and Helpman 1995, Maggi and Ossa 2020) or homogeneous firms (e.g. Krishna 1998, Ornelas 2005). A notable exception is the paper by Blanga-Gubbay et al. (2020), which is complementary to ours. They study lobbying by heterogeneous firms in favour or against of the ratification of RTAs, which lead to the reciprocal elimination of tariffs among member countries. We instead examine how lobbying by heterogeneous firms can shape the content of trade agreements, i.e., the non-tariff provisions included in PTAs.

Our analysis is also related to the literature on deep trade agreements. The number of commitments in preferential trade agreements has increased over time, particularly in areas aiming at facilitating flows of services, goods, and capital (e.g. Horn et al. 2010, Mattoo et al. 2019). Baldwin (2011) and Antràs and Staiger (2012) point out that firms can gain from trade agreements not only through the elimination of tariffs, but also through provisions that reduce non-trade barriers and help to protect their tangible and intangible assets in foreign markets. Recent studies examine in this literature examine whether non-tariff provisions embodied in deep trade agreement boost international trade (e.g. Laget et al. 2020, Maskus and Ridley 2020, Dhingra et al. 2021). Our analysis suggests that identifying the effects of deep PTAs on trade flows can be challenging, due to the endogeneity of the non-tariff provisions included in trade agreements. A positive

correlation between the coverage of non-tariff provisions and trade between member countries should not be interpreted causally, since these provisions are shaped by large multinationals.[6]

Our results support the argument of Rodrik (2018) that large multinational corporations dominate the politics of deep trade agreements, lobbying to include provisions that are favourable to them. An important avenue of future research is to study the implications of these lobbying efforts for aggregate welfare. This would require introducing lobbying by heterogeneous firms in models that focus on specific policies included in deep trade agreements, such as product standards (e.g. Grossman et al. 2020, Maggi and Ossa 2020, Parenti and Vannoorenberghe 2020).

Our analysis has important implications beyond trade agreements. There is an intense debate on the causes and economic consequences of rising market concentration (e.g. Gutiérrez and Philippon 2018, Autor et al. 2020, De Loecker et al. 2020). Our empirical and theoretical results show that large corporations dominate lobbying on all policy issues. By shaping legislation in their favour, "superstar firms" can thus further increase their market power.

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6 It is hard to systematically link specific provisions to firms' lobbying efforts. However, there is some anecdotal evidence that these efforts are reflected in the text of the agreements. For example, pharmaceutical companies spent large amounts lobbying on the TPP agreement to include favourable provisions on intellectual property rights. The text of the TPP agreement that was signed by President Obama in 2016 reflects these lobbying efforts, since it contains many provisions favourable to drug manufacturers (e.g., strengthening patent exclusivity, providing protections against bulk government purchasing). Interestingly, after President Trump withdrew the United States from TPP, many of the provisions that US pharmaceutical firms had lobbied for were removed from the agreement.

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CHAPTER 5

Global value chains and deep integration

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The post-1990 period has seen a proliferation of preferential trade agreements (PTAs). Some 700 PTAs are currently in force, compared to a little more than 100 PTAs before 1990. Both developed and developing countries have been and are deeply involved in preferential trade liberalisation. While tariff reductions on a preferential basis are a central feature of all trade agreements, the inclusion of provisions that do not pertain directly to merchandise trade policies – e.g. provisions protecting foreign investment (FDI) and liberalising access to markets for services – has become increasingly common in PTAs. As a result, many PTAs regulate trade-related issues more extensively and more stringently than the WTO. Simply put, preferential liberalisation has become the main instrument of trade policy cooperation.

The academic literature in economics and international political economy has shown that the expansion of PTAs moves hand in hand with growth in FDI flows, offshoring, and global value chain (GVC) production (Baccini et al. 2017, Blanchard 2007 and 2010, Blanchard et al. 2017, Bown et al. 2020, Chase 2003, Manger 2009). There is growing consensus that the activities of multinational enterprises, which splinter economic activity across countries, drive the formation of deep PTAs (Antràs and Staiger 2012, Baldwin 2011, Mattli 1999, Rodrik 2018). Recent studies show that corporations involved in global production lobby in favour of deep PTA negotiations and outspend import-competing industries to sway trade policy decisions (Baccini et al. 2019, Blanga-Gubbay et al. 2020, Bombardini 2008, Osgood 2018, Rönnbäck 2015).

There are several reasons why PTAs appeal to economic actors involved in GVCs. Preferential liberalisation cuts tariffs on trade in intermediate goods between signatory countries, which is a core feature of GVCs (Blanchard and Matschke 2015, Chase 2003). Trade in intermediates is often intra-firm trade, driven by vertical foreign direct investment, which makes investment provisions that protect multinational enterprises' assets in host markets a desirable feature of PTAs. PTA provisions that liberalise trade in services facilitate intra-firm movement of data, technology, and personnel. As important

are effective dispute-settlement mechanisms that enhance the credibility of deep-integration commitments, given that multinational enterprises face high risks of direct and indirect expropriation (Kim 2012).

METHODOLOGY AND DATA

Empirical analysis has struggled to identify a clear-cut causal effect of GVC trade on the depth and design of PTAs. In a recent paper, we attempt to fill this gap (Baccini et al. 2021) using detailed information on the content of PTAs and measures of the GVC intensity of gross exports.

Empirically estimating the effect of trade on trade policy (in our case, the design/depth of PTAs) confronts a serious endogeneity problem as trade policy is very likely to have an effect on trade. Possible reverse causality makes identification of the causal impact of GVCs on PTA design a challenging task. In our paper, we propose a novel instrument for trade flows based on Altomonte et al. (2018). The identification strategy exploits a recent transportation shock: the sharp increase in the maximum size of container ships, which has more than tripled during our sample period. The key variation in our instrument hinges on the fact that only deep-water ports can accommodate new larger ships and therefore, as larger ships become available, countries export relatively more towards partner countries that are more endowed with deep-water ports.

We construct our instrument by predicting trade flows from gravity estimations that include the interaction between the time-varying transportation shock (the maximum size of container ships), the country-level presence of deep-water ports, and bilateral exogenous dyadic variables such as geographical distance between two trading partners. Identification of the causal effect of trade on trade policy rests on the following assumption: conditional on controls and allowing for heterogeneity across country pairs based on bilateral characteristics, the variation in trade flows that is triggered by the presence of deep-water ports in partner countries – combined with the increase in the size of container ships – only affects trade policy formation through its effect on observed trade. Our strategy is flexible enough to generate excludable instruments for different value-added components of exports. This allows us to assess how the design of PTAs is affected by gross exports as well as by trade through GVCs, as captured by indicators of trade in domestic and foreign value added.

Armed with this identification strategy, we estimate the causal effects of gross exports and value-added trade on a synthetic indicator of PTA depth and on different dimensions of PTA design, including services liberalisation, investment provisions, and the presence of binding dispute-settlement mechanisms. We build outcome variables capturing whether PTAs include 'WTO-PLUS' or 'WTO-EXTRA' provisions that go beyond what is regulated in WTO multilateral agreements. To build a broad and comprehensive portfolio of outcome variables, we merge two key datasets with information on the content of trade

agreements: the DESTA database (Dür et al. 2014), which includes synthetic indicators of PTA depth, and the recent World Bank Deep Trade Agreements database, which contains information on a broader set of specific provisions in PTAs.

We focus on the pre-crisis period 1995–2007, which witnessed a rapid expansion of GVCs, and on the 40 countries covered by the World Input-Output Database from which we source the trade data for the analysis. Given this sample, the information used to construct our dependent variables comes from PTAs signed up to 2007, where at least two signatories belong to the sample of 40 countries included in the World Input-Output Database. These encompass 160 agreements in the DESTA database and 24 PTAs in the World Bank database.

RESULTS

We find that GVC trade and in particular the foreign value-added component of exports increases PTAs' depth. The size of our estimated causal effect is substantial. When we take our most conservative estimate, moving the foreign value-added component of bilateral exports in any sector by two standard deviations increases the level of depth in the bilateral trade policy relationship by 35% of the average depth in our sample. This effect roughly corresponds to going from the level of depth of the EC-Jordan Euro-Med Association Agreement (at the 67th percentile in the unconditional distribution of depth considering all agreements coded in DESTA) to that of the EC Europe Agreements with Estonia, Latvia and Lithuania (between the 78th and 81st percentile). These agreements have all been signed during the second half of the nineties but the difference between them is significant: Europe Agreements are notably very deep and comprehensive, as they pave the way for accession to the EU, while the EC-Jordan Association Agreement does not cover regulatory areas and does not address important issues such as government procurement nor introduce any significant level of commitment in services and investment liberalisation (Hoekman and Djankov 1997).

Our results also show that trade and trade through GVCs have heterogeneous effects on the probability of including broadly identified chapters across different issue areas. However, we find that trade through GVCs systematically increases the probability that a number of narrowly defined 'WTO-PLUS' and 'WTO-EXTRA' provisions are included. These results provide empirical evidence that more intense GVC activities between two countries tend to increase the probability that deep PTA-based integration between them goes further than the WTO regime. Finally, we show that when looking at specific PTA provisions, the effect of GVC trade tends to be larger than the effect of gross exports, which also include activities unrelated to global production.

CONCLUSION

PTAs have become deeper and deeper over time, a trend that appeared for a while impossible to reverse or even to stop. However, our findings show that – for the period under analysis – this trend has been affected by the expansion of GVCs. Protectionist policies implemented by populist parties and the COVID-19 pandemic are likely to contract GVCs, at least for the near future. If this is the case, the GVC-related incentives to design deep trade cooperation might be reduced in the next stage of globalisation.

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CHAPTER 6

Pro-competitive provisions in deep trade agreements

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Two of the oldest ideas in international trade are that trade increases competition and that while preferential trade agreements (PTAs) may generate benefits for members through expanded trade, they might also introduce losses for non-members through trade diversion. Over time, a number of important methodological contributions, including Egger (2000), Anderson and VanWincoop (2003), Baier and Bergstrand (2007), Romalis (2007), Egger et al. (2011) and Baier et al. (2014), have advanced our understanding of how to quantify changes in the value of trade among PTA partners, as well as between PTA members and outsiders.

With the rise of non-tariff barriers and the deepening of PTAs, the latest generation of trade agreement studies have shifted focus to explore which commitments in PTAs generate the largest increases in trade (Dhingra et al. 2018) and whether specific commitments made in PTAs generate broad non-discriminatory increases in trade or feature trade diversion away from non-members (Mattoo et al. 2017). At the same time, recent work shows that PTAs and exchange rates affect the market power, prices, and markups of both member and non-member countries (Chang and Winters 2002, Corsetti et al. 2018, Corsetti et al. 2019).

In a new paper (Crowley et al. 2021), we investigate the direct and indirect effects of deep trade agreements on product-level exports, prices, and markups of firms. To do so, we introduce the use of trade-weighted policy measures, which summarise a destination's trade policy towards third countries, in structural gravity equations. These variables act as proxies to capture the indirect effect of the competition intensity in the destination on sales and pricing decisions of exporting firms. Our unique approach not only quantifies the direct impact of PTAs and their associated tariff changes on exporters in partner countries, but also measures the indirect, third-country competition effects arising from the existence of PTAs between a destination and other, third-country origins. This allows us to assess whether PTAs lead to less destination-specific market power for firms.

Our analysis is based on 27.5 million firm-product-origin-destination-year observations, encompassing 640 thousand firms located in 13 low- and middle-income countries, and 257 deep trade agreements. The latter are sourced from the World Bank Deep Trade Agreements database and allow us to evaluate the effects of detailed commitments to

specific policies and institutions embedded in the deep trade agreement provisions. We apply bilateral origin-destination fixed effects to control for underlying time-invariant structural factors that drive trade, firm-product-origin-time fixed effects to control for time-varying supply shocks at the level of a product within a firm, and product-destination-time fixed effects to control for time-varying product-demand shocks in an importing country. Our analysis thus captures partial PTA effects because PTA-induced changes in the competitive environment in origin and destination countries are absorbed in time-varying multilateral resistance terms (as in Anderson and van Wincoop 2003, Feenstra 2004, Redding and Venables 2004, Baier and Bergstrand 2007, Head and Mayer 2014, Baier et al. 2014, and Mattoo et al. 2017).

TRADE STRUCTURE AND THIRD-COUNTRY COMPETITION

We find that exports are impacted directly by a country's own PTAs as well as indirectly by the PTAs signed by its competitors. Tariff reductions are an important component in the PTAs of developing and emerging countries; we begin with the direct and indirect impacts of tariff cuts under PTAs. See the leftmost panel of Figure 6.1. The first bar reveals that – after controlling for the existence of a PTA, time-invariant factors between each origin and destination, and time-varying origin and destination factors – the direct effect of a 1% reduction in tariffs under a PTA is to increase firms' export sales by 1.3%. To examine how PTAs interact with global value chains, we quantify the impact of a 1% reduction in tariffs on exports of final consumption goods and intermediate inputs. The second bar shows that a 1% tariff cut increases exports of final consumption goods by 1.6%. The positive impact on intermediates is considerably smaller, an increase of only 0.5%. This suggests that the introduction of a PTA impacts the export structure of the countries in our study, apparently shifting them toward assembly of final goods.

Interestingly, for our group of emerging and developing countries, we find substantial indirect effects arising from the tariff cuts in the PTAs signed by their competitors. See the rightmost panel of Figure 6.1. If 50% of a firm's competitors enjoy a 1% tariff cut through a PTA, this reduces exports from firms in non-member origin countries by 1.6%. Breaking this result down by the end use of a product, we find quantitatively similar results for final goods and intermediates. The story that emerges is that tariff cuts under PTAs expand bilateral trade among PTA members, but also have indirect effects on the trade of non-members.

FIGURE 6.1   IMPACT OF TARIFFS ON EXPORT VALUES BY PRODUCT END-USE CATEGORY
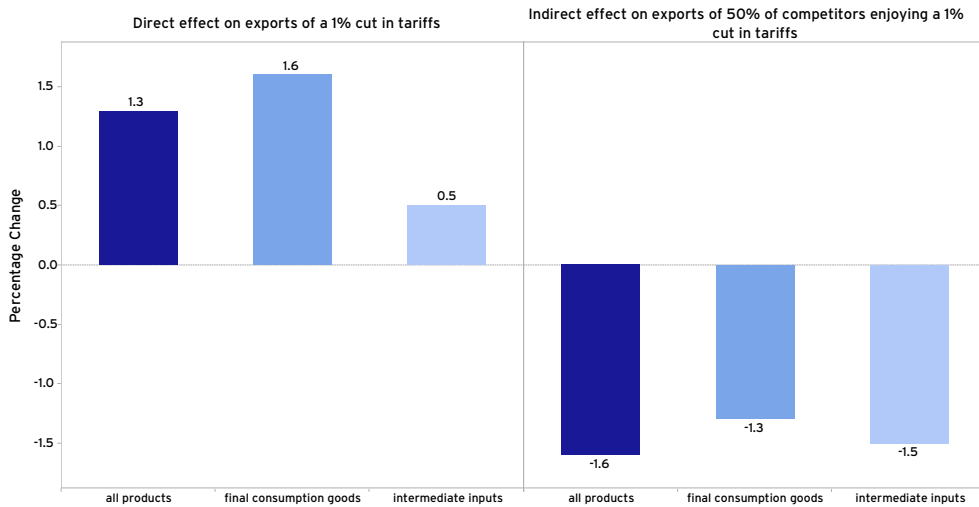
Notes: Bar height represents average percentage change in export values from a 1% increase in bilateral tariffs for 13 origin countries after controlling for firm-origin-product-year, destination-product-year and origin-destination fixed effects (left panel) and average percentage change in export values when 50% of one's competitors experience a 1% increase in bilateral tariffs in the destination (right panel) based on estimates from Table 3 (column 3, rows 2 and 4) and Table 7 (columns 1 and 2, rows 2 and 4) in Crowley et al. (2021).

MARKUPS UNDER PTAS

Turning to markups, we find suggestive evidence of a pro-competitive effect of PTAs. A firm's product-level markup in a destination tends to decline when its origin country participates in a PTA with this destination. The leftmost panel of Figure 6.2 shows that the reduction in markups associated with joining a PTA are quantitatively similar in magnitude for all goods (-3%), final consumption goods (-3%), and intermediate inputs (-2%). We also observe that trade agreements signed by competitors lead to markup reductions. If 50% of one's competitors sign a PTA with a destination, an origin's markups fall by 2.5% for all goods and for final consumption goods. The effect on markups of intermediates is smaller and statistically indistinguishable from zero.

FIGURE 6.2   IMPACT OF PTAS ON EXPORT MARKUPS BY PRODUCT END-USE CATEGORY
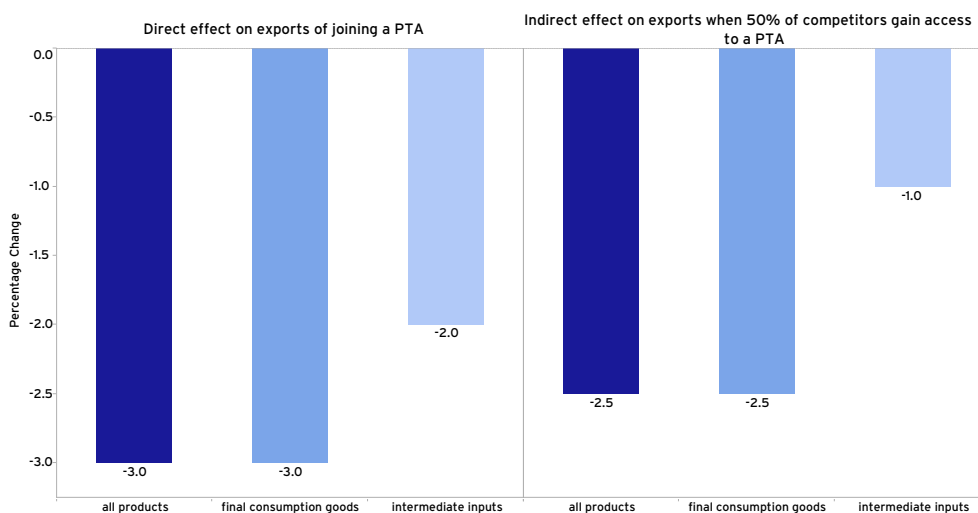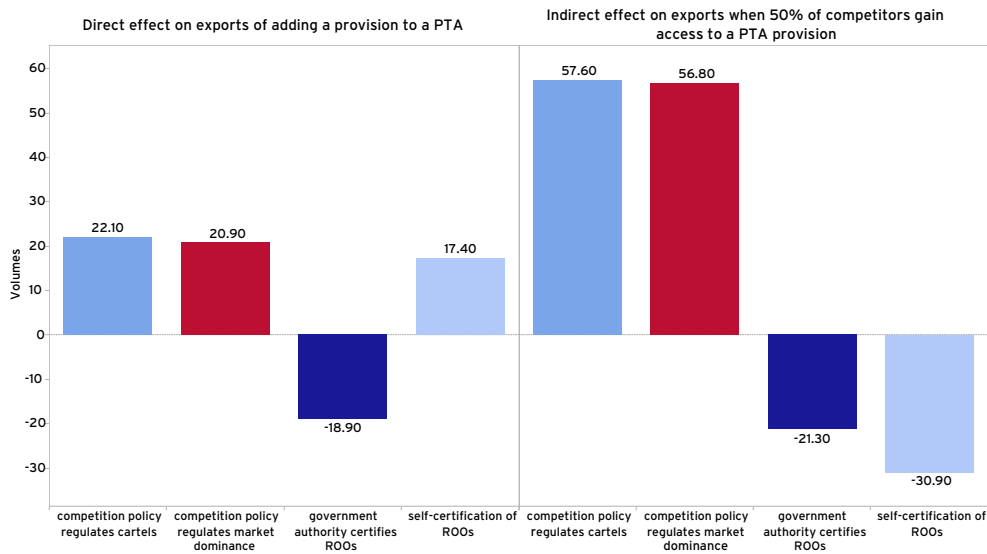

Notes: Bar height represents average percentage change in export markups from joining a PTA for 13 origin countries after controlling for firm-origin-product-year, destination-product-year and origin-destination fixed effects (left panel) and average percentage change in export markups when 50% of one's competitors gain access to a PTA with the destination (right panel) based on estimates from Table 3 (column 6, rows 1 and 3) and Table 8 (columns 1 and 2, rows 1 and 3) in Crowley et al. (2021).

SPECIFIC PROVISIONS OF DEEP TRADE AGREEMENTS BOOST OR RETARD TRADE

Specific provisions of PTAs have a sizeable impact on the volume of trade. We augment the preceding analysis to include dummy variables related to precisely defined commitments in areas including competition policy and rules of origin.

We find that substantive commitments that prohibit or regulate anticompetitive behaviours are associated with higher trade volumes. See Figure 6.3. Commitments over competition policy capture whether or not an agreement prohibits or regulates (i) cartels or concerted practices and (ii) the abuse of market dominance. Inclusion of these commitments in a PTA increases the volume of trade by 22% and 21%, respectively (left panel of Figure 6.3). Further, when competing countries in a destination have committed to prohibiting cartels or regulating market dominance in their PTAs with the destination, this expands trade from non-member origins. If 50% of competitors have PTAs that include these commitments, export volumes from non-member origins grow an astounding 58% and 57%, respectively (right panel of Figure 6.3). In other words, the general practice of making a substantive commitment to competition policies is associated with higher trade volumes from all destinations.

FIGURE 6.3   IMPACT OF PTA PROVISIONS ON EXPORT VOLUMES

Direct effect on exports of adding a provision to a PTA

Indirect effect on exports when 50% of competitors gain access to a PTA provision

Notes: Bar height represents average percentage change in export volumes from adding a given provision to a PTA for 13 origin countries after controlling for firm-origin-product-year, destination- product-year and origin-destination fixed effects (left panel) and average percentage change in export volumes when 50% of one's competitors gain access to a PTA provision (right panel) based on estimates from Table 10 (columns 1 and 4) and Table 13 (columns 5 and 6) in Crowley et al.(2021)

To receive preferential, duty-free treatment under a PTA, an exporting firm must prove that its exported merchandise meets the agreement's rules of origin ('ROOs' in Figure 6.3). These rules typically require that a specific fraction of a product's value-added be produced within the member countries of a PTA or that a product undergo a 'substantial transformation' within the PTA's area. We focus on two distinct and mutually exclusive provisions regarding proof of origin. First, we analyse the impact of a provision under which only a government authority can provide documentation that proves origin. Second, we examine the impact of a less burdensome provision that allows a firm to self-certify that its exported goods meet the trade agreement's rules of origin.

When an exporter must have a government authority provide the necessary documents to prove that it meets a PTA's rules of origin, this reduces the volume of exports by 19% (see the third bar in the left panel of Figure 6.3). In contrast, permitting firms to self-certify the origin of their merchandise increases the volume of exports by 17% (see the leftmost panel of Figure 6.3). Most importantly, both rules-of-origin provisions are associated with reduced exports from non-members. When PTA members must obtain proof of origin from a government authority, the volume of exports from non-members declines by 21%. When the PTA offers privileged rules-of-origin tariff status through self-certification of origin, this reduces the volume of exports from non-member origins by an even larger amount – 31%. The difference between the indirect impacts of competition-policy provisions and rules-of-origin provisions could not be more stark – the exclusive

nature of rules-of-origin provisions depresses third-country trade. In sharp contrast, substantive commitments to competition seem to enhance economic integration by expanding the volume of trade from all countries.

PRO-COMPETITIVE IMPACTS OF DEEP TRADE AGREEMENT PROVISIONS ON MARKUPS

While PTAs appear to be associated with lower markups overall, the picture gets more complicated when we turn to specific provisions related to competition policy and rules of origin. The inclusion of substantial commitments to prohibit or regulate anticompetitive practices yields real reductions in markups of 4%, regardless of whether the commitment is to limit cartels or market dominance (see the leftmost panel of Figure 6.4). A provision requiring that a government authority provide proof of origin is associated with a 7% higher markup, in line with the finding in Figure 6.3 that this provision reduces trade volumes. Interestingly, the third-country effects of rules-of-origin regimes with self-certification appear to be pro-competitive. See the rightmost panel of Figure 6.4. When 50% of competitors in a destination have a rules-of-origin provision allowing them easier market access via self-certification, this leads to a 3% reduction in markups from non-member origins. Altogether, these findings present a complex picture which highlights the important role of PTA provisions in facilitating or retarding competition.

FIGURE 6.4   IMPACT OF PTA PROVISIONS ON EXPORT MARKUPS
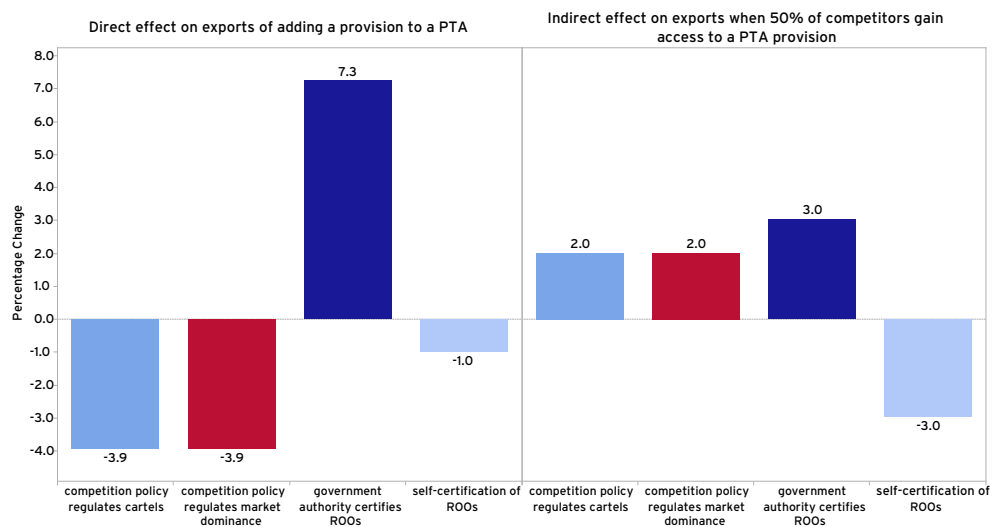
Notes: Bar height represents average percentage change in export volumes from adding a given provision to a PTA for 13 origin countries after controlling for firm-origin-product-year, destination- product-year and origin-destination fixed effects (left panel) and average percentage change in export volumes when 50% of one's competitors gain access to a PTA provision (right panel) based on estimates from Table 10 (columns 1 and 4) and Table 13 (columns 5 and 6) in Crowley et al.(2021)

CONCLUSION

Our new study breaks ground by showing that pooling large, administrative datasets of firms' trade can generate new insights into the pro-competitive impact of deep trade agreements. Delving into the detailed trade policy commitments of all countries that have formed PTAs with a destination facilitates a better understanding of how these agreements stimulate or retard competition, thus leading to better guidance for future policy.

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PROTECTIONISM AT THE BORDER AND BEYOND

CHAPTER 7

The impact of preferential trade agreements on the duration of antidumping protection

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Antidumping duties and preferential trade agreements (PTAs) are two of the more prominent trade policy developments over the last four decades. Between 1980 and 2015, more than 7,100 antidumping cases were initiated by 50 countries and about 4,100 cases resulted in measures being imposed (Bown 2015), making antidumping the most common form of discretionary protection that accounts for about 90% of the administered protection imposed (Bown 2011). Over the same time, there has been a rapid expansion of PTAs. As of 2020, nearly 500 PTAs have been notified to the WTO, with 306 of these in force.

Antidumping and PTAs both discriminate against trading partners. PTAs discriminate against non-PTA members by decreasing the tariff rates for members, while antidumping duties increase the level of protection on a set of targeted suppliers. If, in addition to lowering tariffs on member countries, PTAs reduce antidumping protection against PTA members relative to non-PTA members, then the discretionary nature of antidumping protection might reinforce the discrimination that is inherent in PTAs. This possibility seems particularly likely for those PTAs that have specific rules related to the use of antidumping measures against PTA members (Blonigen 2005, Prusa and Teh 2010, Bown and Tovar 2016, Prusa 2016).

In a new study (Prusa and Zhu, 2021), we extend the existing research to examine if PTAs have affected the duration of antidumping protection. Unlike some forms of administrative protection, antidumping protection can remain in place for as long as the country imposing the protection wants. The WTO Antidumping Agreement only requires that countries periodically review the antidumping orders and assess whether the protection is still needed.

This study takes advantage of two databases developed by the World Bank – the Global Antidumping Database (Bown 2015) and the Deep Trade Agreements database (Mattoo et al. 2020). The former contains key case information for all antidumping actions initiated by all major users for the period 1980 to 2015. As part of an expansive project, Prusa (2020) maps antidumping provisions in 283 PTAs notified to the WTO between 1958 and 2015. By combining the information in the two databases, we can determine for

each case when antidumping measures were imposed and when, if ever, the measures were removed. We are also able to determine if the antidumping user and antidumping target were members of a PTA, and if so, whether the antidumping measure was in place before, during, or after the antidumping measure.

Before analysing the impact of PTAs, it is instructive to first review the overall duration trends using the non-parametric Kaplan-Meier survival estimator. Because more than one-third of the antidumping measures imposed were still in place at the end of 2015, survival analysis techniques must be used to properly account for the censoring issue.

In Table 7.1 we report the number of quarters of protection for the 25th percentile, 50th percentile, and 75th percentile of measures. As seen in the table, across all antidumping measures, half were revoked within 27 quarters. Said differently, the median duration across all antidumping measures against all targeted countries over the entire 1980–2015 sample is 27 quarters, or just about seven years. While this median estimate is not unlike the eight-year maximum length of protection specified under the safeguard agreement, a sizeable proportion of duties are in place for far longer: 25% of all antidumping measures last longer than 52 quarters (13 years).

TABLE 7.1   KAPLAN-MEIER ESTIMATED SURVIVAL TIME

(quarters of protection)		Survival time		
	No. of cases	25%	50%	75%
All cases	4,064	22	27	52
Cases – Non-China	3,120	21	25	48
Cases – China	944	23	49	87

One of the major developments in antidumping activity over the past 20 years has been the emergence of China as a prime target of antidumping measures. In terms of duration, there is compelling evidence that China is being treated differently than other WTO members. When we divide the targeted countries into 'China' and 'all countries except China', we see that antidumping protection against China is far longer lived than against other countries. The median duration for cases against China (49 quarters) is longer than the 75th percentile for all other countries; remarkably 25% of cases against China are in place for more than 20 years.

To get a sense of the PTA effect, we begin by examining the pre- and post-PTA duration for each country that uses antidumping measures. We do not specify one year to define the pre- versus the post-period for all users; rather, we allow the pre-/post-period to vary by antidumping user. This approach allows us to identify a country-specific 'early' and

'late' period. For all country pairs of PTA members, we use the PTA inception date as the date that defines pre versus post. For country pairs who are not PTA members, we demarcate the pre-/post-period with the date of each antidumping-using country's most economically significant PTA. As seen in Table 7.2, the median duration is about the same in the pre- and post-periods: 25 and 28 quarters, respectively. However, this does not imply there has not been a change in duration. Rather, it appears countries are applying much more scrutiny for the upper half of cases. The 75th-percentile duration in the early period is 48 quarters as compared to 70 quarters in the later period, a considerable increase in the length of protection.

TABLE 7.2   DURATION OF ANTIDUMPING MEASURES, PRE- AND POST-PTAS

(quarters of protection)		Survival time		
	No. of cases	25%	50%	75%
Pre-PTA	1,666	21	25	48
Post-PTA	2,398	22	28	70

To evaluate the impact of PTAs on duration, we rely on Prusa (2020), who maps PTAs into three mutually exclusive categories: (i) PTAs that disallow antidumping actions among members; (ii) PTAs that have no specific language or provisions on antidumping; and (iii) PTAs that allow antidumping against PTA members but include specific provisions on how antidumping is to be implemented against PTA members. The categorisation means we have 153 PTAs with no rules, 109 with antidumping rules, and 21 that prohibit the use of antidumping.

The next step is to overlay the pre-/post- analysis with the information on whether the user and target are in a PTA, and if so, whether the PTA has antidumping rules. These results are depicted in Table 7.3.

It is useful to compare how the estimated duration varies over time. Before the PTA was enacted, antidumping cases involving PTA members had a longer duration than those not involving PTA members. By contrast, we see that once the PTA is enacted, the order is flipped. Cases among PTA members have a shorter duration as compared to those against non-PTA members. The median duration increased by 12 quarters for targeted countries who are not PTA members but decreased for those who were PTA members: 4 quarters for those who were in PTAs without antidumping rules and 15 quarters for those in PTAs with rules. These figures suggest that PTAs do reduce the length of antidumping protection, a finding that we confirm in our formal econometric estimates.

TABLE 7.3   DURATION OF ANTIDUMPING MEASURES, PRE-/POST-PTAS, PTA CLASSIFICATION

(quarters of protection)		Survival time		
	No. of cases	25%	50%	75%
Pre-PTA				
No PTA	1,308	21	25	47
PTA – No antidumping rules	174	21	32	51
PTA – Antidumping rules	184	24	38	53
Post-PTA				
No PTA	1,712	23	37	77
PTA – No antidumping rules	480	21	28	48
PTA – Antidumping rules	206	19	23	38

Given our prior discussion about the rising number of antidumping cases targeting China, we are concerned about the extent to which these differential effects are caused by China. To investigate this issue, we re-did the analysis excluding China as a target. As shown in Table 7.4, excluding China indeed reduces the pre-/post- effect but does not alter the finding regarding the impact of PTA membership. It appears the enactment of PTAs shortens the duration of antidumping measures between members (with no effect or perhaps a slight increase in duration for non-members).

The above discussion suggests that there are changes that relate to both time (pre- versus post) and also PTA membership. Because PTA members may be less likely to have affirmative determinations in the first place, we formally examine the issue using a Heckman selection model to control for non-random selection. In particular, we observe the length of the protection only for antidumping cases that resulted in measures being applied. For those antidumping investigations that were rejected (no duties applied) or were 'settled', we do not have any information on duration. If the decision to impose antidumping duties is systematically correlated with unobservables that also affect the duration, using only the antidumping measures might produce biased estimators.

TABLE 7.4   DURATION OF ANTIDUMPING MEASURES, PRE-/POST-PTAS, PTA CLASSIFICATION (EXCLUDE CHINA)

(quarters of protection)		Survival time		
	No. of cases	25%	50%	75%
Pre-PTA				
No PTA	1,159	21	24	45
PTA – No antidumping rules	117	22	41	68
PTA – Antidumping rules	167	23	37	52
Post-PTA				
No PTA	1,160	22	27	52
PTA – No antidumping rules	315	21	24	46
PTA – Antidumping rules	202	19	23	38

In the first stage, a selection equation investigates the binary decision of whether or not to impose antidumping measures, estimated through a probit. In the second stage, the outcome equation focuses on the length of the protection conditional on an affirmative determination. Given that our dependent variable measures antidumping duration, which is naturally right-censored, we estimate a censored normal regression model. The selection equation includes the same independent variables as the outcome equation, except for the selection variables. The key feature of this procedure is to include variables that affect the decision of whether to impose measures, but which are not relevant for the duration of protection. In our probit estimation, we include the bilateral exchange rate and the GDP of the antidumping-using country as the selection variables. These two variables control for unobserved macroeconomic shocks such as business cycles or exchange rate fluctuations that can have significant effects on antidumping activities, as shown by Knetter and Prusa (2003).

The estimation confirms the non-parametric findings. In particular, across all using countries, we find that a PTA leads to a sharp reduction by over 30% in the duration of antidumping measures for its members. The result is confirmed when we partition our users into developing and developed countries, with the strongest results when the targeted country is developed.

We also examine whether antidumping provisions in PTAs exert a greater impact on the duration of such measures. We find the duration of antidumping measures for country pairs with a PTA with antidumping rules is shorter, on average, than country pairs with a PTA without antidumping rules, which in turn is shorter than country pairs not in a PTA. In particular, PTAs with antidumping rules experience more than a 50% reduction in duration, and cases with PTAs with no antidumping rules experience a 25% reduction in duration. Our key findings with respect to the impact of PTAs on the duration of protection remain essentially unchanged after dropping cases targeting China from the analysis.

We believe our study is particularly relevant in the context of the current trade policy arena, which is dominated by PTAs and antidumping protection. Our results indicate that after the implementation of a PTA, antidumping measures on PTA non-partners remain in place for longer periods, further reinforcing the preferences already inherent in the PTA.

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CHAPTER 8

Trade facilitation provisions in deep trade agreements: Impact on Peru's exporters

Woori Lee, Nadia Rocha, and Michele Ruta
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The rapid growth of international trade and global value chains (GVCs) in the past decades has been associated with significant reduction in trade costs, largely driven by tariff liberalisation. While integration into the global market has been an engine for growth in some developing countries, others have been less successful in integrating into regional and global value chains. Border inefficiency and regulatory uncertainty are often viewed as key barriers for developing countries to boost trade, even when tariff levels are low (WTO 2015).

Implementation of trade facilitation measures aimed at improving, simplifying, and harmonising the procedures and controls governing the movements of goods across borders is particularly important in the age of GVCs, where goods cross borders multiple times as part of a production chain. At the firm level, firms participating in GVCs not only export but also import intermediate inputs that are used in their production and exports. In other words, increased efficiency in border procedures has both direct and indirect implications for firms' export performance and GVC participation.

Deep trade agreements (DTAs) can play a major role in pushing trade facilitation forward. Although trade facilitation is often associated with activities of a national customs administration, it also covers other regulatory agencies at the border and beyond. Trade facilitation provisions in DTAs advance the free movement of goods between member countries by including more advanced and sophisticated solutions beyond multilateral commitments. They also include measures to promote cooperation between border agencies or exchange information on best practices. For example, provisions that require publication of regulatory information prior to implementation or internet publication enhance the transparency of trade-related regulations. Implementation of such trade facilitation measures allows easier and quicker flows of imports and exports and reduces uncertainty associated with international trade.

In a recent paper (Lee et al. 2021), we study the impact of trade facilitation provisions in preferential trade agreements (PTAs) on Peruvian firms' exports depending on their GVC linkages. Our results provide new evidence that trade facilitation provisions in PTAs

promote export performance of GVC firms, and especially so when they import inputs from the PTA partner country. Developing countries aiming at better integrating into GVCs should pay particular attention to these provisions in their trade agreements.

DATA

Our analysis combines new data from the World Bank Deep Trade Agreements database (Mattoo et al. 2020) with data on imports and exports at the firm level for Peru from the Exporter Dynamics Database (Fernandes et al. 2016). The information on the import side of exporting firms – whether they import, what, and from where – allows an econometric analysis of a potentially differential impact of trade facilitation provisions on GVC firms, through the importing channel. To capture these differential impacts, the analysis distinguishes three types of firms: traditional exporters that rely on domestic inputs for their exports, GVC firms that import intermediate inputs from other countries as well as export, and bilateral GVC firms, a subset of GVC firms that import inputs from and export to the same countries. Intuitively, GVC firms, relative to traditional exporters, can have larger gains from enhanced trade facilitation from both the importing and exporting channels, as PTA provisions improve border efficiency and transparency both at the Peruvian and partners' borders.

The years for which there is available information (2000–2017) represent a period where Peru actively concluded a large number of PTAs with many major trading economies. Specifically, Peru entered 12 PTAs during the sample period with 38 countries in the dataset. These agreements vary in terms of overall depth as well as trade facilitation provisions (Figure 8.1). While, on average, deeper trade agreements also tend to cover more trade facilitation provisions, this correlation is not perfect. For example, the Peru-Korea (2011) and EU-Colombia/Peru (2013) agreements have the highest number of overall provisions among Peru's PTAs, while the highest number of trade facilitation provisions are included in the Canada-Peru (2009) and Panama-Peru (2012) agreements. The imperfect correlation allows us to identify the effect of trade facilitation provisions while also controlling for the overall depth of the agreements.

FIGURE 8.1   PERU'S DEEP TRADE AGREEMENTS (2000-2017)
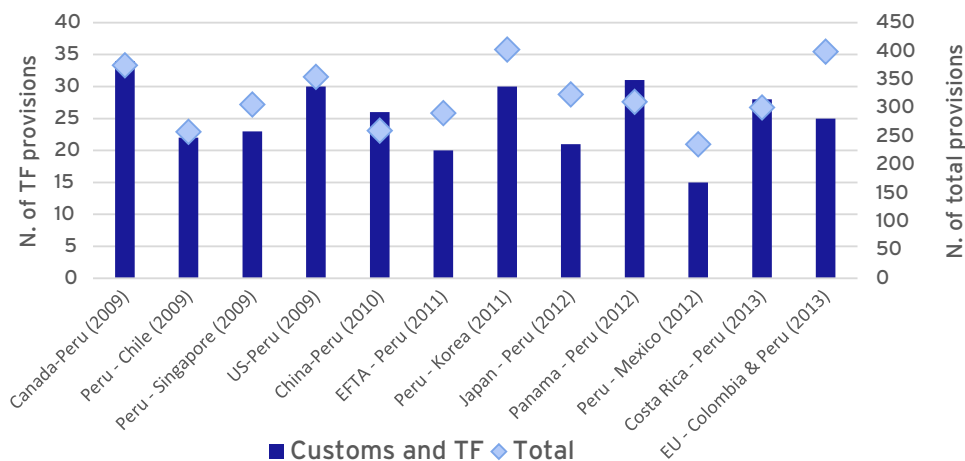
Note: TF = trade facilitation

THE DIFFERENTIAL IMPACT OF TRADE FACILITATION PROVISIONS ON PERU'S EXPORTERS

Trade facilitation can be defined as the simplification, modernisation, and harmonisation of export and import processes (Kieck 2020). The impact of trade facilitation provisions in PTAs have multiple dimensions that affect trade costs in different ways. To illustrate these different aspects, Figure 8.2 visualises the effect of trade facilitation provisions using an example PTA between Peru and the US border. Trade facilitation provisions in this agreement can affect import procedures at both Peru's border and the US's. On both sides, some provisions will affect imports from all countries in the same way – we refer to these provisions as MFN provisions (from 'most favoured nation'). For example, the establishment of a single window that allows firms to submit documentation for importation, exportation, or transit of goods through a single entry point can significantly enhance border efficiency and are typically adopted in a non-preferential way. This means that even if the establishment of a single window was triggered by a provision in a PTA, the gains are not limited to the PTA partner country, as all trade flows across the border become more efficient. Other provisions such as the mutual recognition of authorised operators or exchange of information, provide preferential treatment to imports from the partner only. These elements will generate heterogeneous effects of the PTA on Peruvian exports to the US.

How are traditional exporters and GVC firms affected by trade facilitation provisions? First, consider a traditional exporter that only relies on domestic inputs to export. Trade facilitation provisions in the Peru-US PTA can promote Peruvian exports to the US, as import procedures become simpler at the US border. Peruvian exporters will benefit from trade facilitation measures at their destination, whether they are applied MFN or preferentially. In Figure 8.2, this corresponds to channels (c) and (d).

Second, consider a GVC firm that imports intermediate inputs from a third country and exports to the US. In addition to any improvements on the US side for processing their shipments, these firms can also benefit from expedited or more predictable import procedures at the Peruvian border. To the extent that the trade facilitation measures included in the PTA affect import shipments from all countries (MFN provisions), GVC firms will gain from the enhanced efficiency in their supply chain, regardless of where they import inputs from. Their gains are represented by (a)+(c)+(d) in Figure 8.2.

Finally, there are firms that both import intermediates from and export to the US – we refer to these firms as 'bilateral GVC firms'. These firms can benefit from the most channels, as their imports from the US gain both from non-discriminatory and preferential provisions. Their potential gains are characterised by (a)+(b)+(c)+(d).

FIGURE 8.2   EFFECT OF TRADE-FACILITATION PROVISIONS IN PERU-US FTA

Peruvian exporters benefit from channels:
-    (c)+(d) if they (only) export to the US (tradional exporters)
-    (a)+(c)+(d) if they import inputs from rest of the World and export to the US (GVC firms)
-    (a)+(b)+(c)+(d) if they import inputs from the U.S. and re-export to the US (bilateral GVC firms)

Peru's border   **US border**
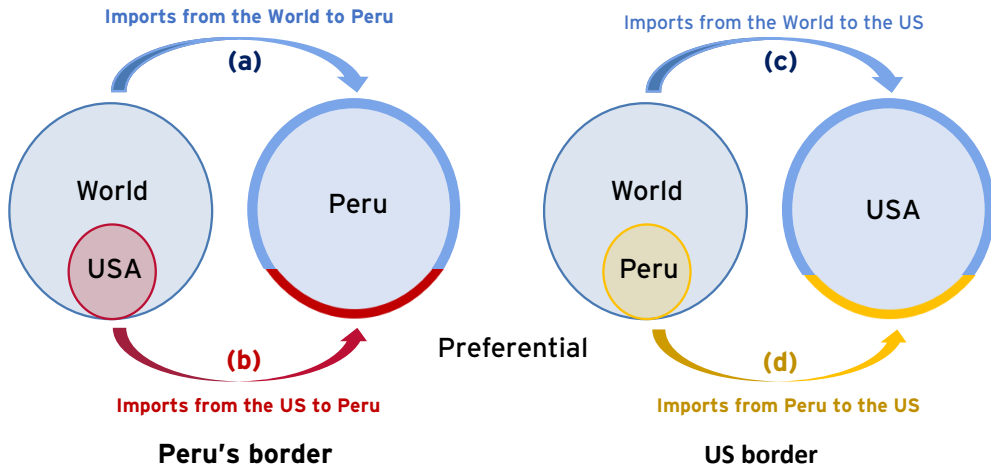
Empirical estimation of a gravity equation – including a rich set of fixed effects to control for a wide range of other factors that can affect firms' exports to a particular country – highlight that the average effect of trade facilitation provisions on export participation is positive and significant, controlling for other provisions in the PTA (Figure 8.3). We find that the positive impact of trade facilitation provisions is driven by GVC firms. Although trade facilitation provisions have no significant impact on firms that only export (traditional exporters), the estimated effect for exporters that import intermediates is positive and significant. For GVC firms, a PTA with average overall depth that includes trade facilitation provisions at the 'deepest' level increases the probability of export participation by about 3.4% (Figure 8.3, panel a). For bilateral GVC firms that import

inputs from the PTA partner country, this effect is larger, at 9.9%. Qualitatively similar results hold at the intensive margin, where trade facilitation provisions in DTAs increase export values to the partner country significantly for GVC firms (Figure 8.3, panel b).[1]

FIGURE 8.3   HETEROGENEOUS EFFECT OF TRADE FACILITATION PROVISIONS ON GVC FIRMS
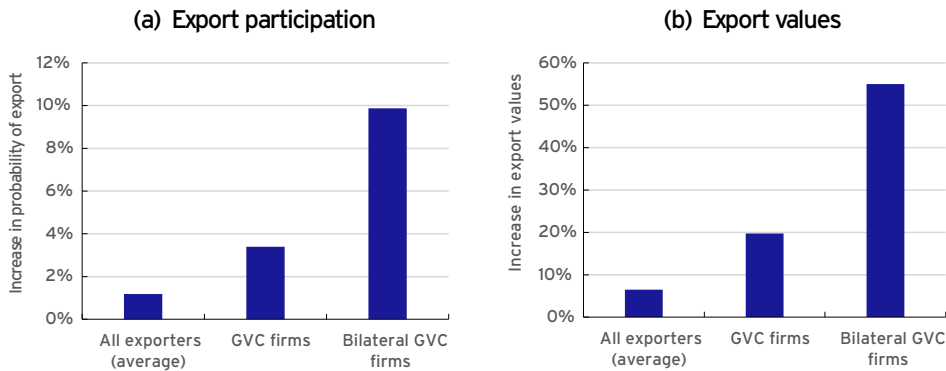
Note: The bars represent the impact of PTAs with average overall depth that include trade facilitation provisions at the 'deepest' level for different types of firms, estimating equation (2) in Lee et al. (2021). Results are statistically significant at 95% confidence. All regressions control for GDP in destination country and include firm-year and destination fixed effects.

CONCLUSIONS

The econometric analysis shows that the effects of DTAs are heterogeneous across firm types, depending on their GVC linkages. Trade facilitation provisions help export performance of GVC firms by reducing trade costs and uncertainty associated with import processes, both in the home country and the destination country. In the case of Peru, the main benefits of trade facilitation provisions in DTAs seem to materialise through the efficiency enhancements at their own border, allowing GVC firms to get their inputs in a more timely and predictable manner. As a result, Peruvian GVC firms are more likely to export and tend to export larger values to countries with which Peru has a DTA containing trade facilitation provisions.

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1   Other provisions in deep trade agreements may also have differential impacts on GVC firms. As a sensitivity analysis, we include additional interactions terms allowing the effect of PTAs and overall depth to vary across firm type. The positive and significant effect of trade facilitation provisions on GVC firms remain robust. The results are also robust to an alternative estimation using Poisson pseudo maximum likelihood model. See Lee et al. (2021) for details.

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CHAPTER 9

Heterogeneous impacts of sanitary and phyto-sanitary and technical barriers to trade regulations: Firm-level evidence from deep trade agreements

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The uneven participation of firms in international trade is extensively documented in the empirical literature: the largest and most productive firms are the most likely to enter and successfully grow in export markets (see Bernard et al. 2007, 2012, and Melitz and Redding 2015). One of the key explanations of such uneven participation is the presence of fixed costs to enter export markets (see Melitz 2003, Chaney 2008, and Bernard et al. 2011). Regulatory diversity across countries is an important component of such fixed entry costs. Importing countries often impose different regulations, standards, testing and certification procedures, referred to as non-tariff measures. These can include sanitary and phyto-sanitary (SPS) and technical barriers to trade (TBT) regulations (see UNCTAD 2012 and WTO 2012).

While SPS and TBT regulations are generally imposed with legitimate goals to address market failures and protect consumers, health, or the environment, regulatory heterogeneity across countries can amount to an obstacle to trade (Chen and Novy 2011). Firms may need to make additional investments in technology or incur specification costs of adjusting product and/or production processes in order to comply with regulations imposed by destination countries that differ from their home country's. These compliance costs can be prohibitive for small firms (Macedoni and Weinberger 2020).

Preferential trade agreements (PTAs) have increasingly regulated the use of non-tariff measures between member countries, with special attention to SPS and TBT measures (Espitia et al. 2020, Stone and Casalini 2020). In addition to provisions related to technical regulations, standards, and procedural regulations linked to transparency and to conformity and risk assessments, several PTAs stipulate that member countries will strive to enter into different forms of regulatory cooperation. Some PTAs mutually recognise members' regulations as being equivalent to their domestic ones; other PTAs have opted for a harmonisation process to unify their domestic regulations with international or regional standards. These distinct approaches could affect the fixed costs of exporting for firms in different ways. While mutual recognition of member countries' regulations could

reduce the costs of having to comply with a multiplicity of regulations, the harmonisation of member countries' regulations could have additional costs for exporters to cope with the newly established standards.

New research by Fernandes et al. (2021) addresses these issues by investigating the impact of regulating the use of SPS and TBT measures through PTAs on exports of firms in Chile, Colombia, and Peru, emphasising the differences along the firm size spectrum. We use a gravity equation framework with a stringent set of fixed effects and control for the overall depth of the PTA, as well as for product-specific bilateral tariffs, to study how including SPS and TBT provisions in PTAs affects firm-level bilateral product-level exports.

Two novel sources of data are used. First, we use data from the World Bank Deep Trade Agreements database (Mattoo et al. 2020) that contains all provisions related to the policy areas of SPS and TBT (as well as another 16 policy areas) included in PTAs signed over the last 40 years. The templates for mapping the SPS and TBT provisions cover areas such as (a) reference to the WTO rules; (b) type of integration approach (harmonisation versus mutual recognition) for standards, technical regulations, and conformity assessment procedures; (c) transparency; (d) institutions or mechanisms to administer the agreement and solve disputes; and (e) cooperation among regional partners on standards-related issues.

Second, we use longitudinal administrative firm-level datasets from customs in Chile, Colombia, and Peru covering the universe of exporters between 1996 and 2015. These countries are excellent case studies for studying the impact of PTAs, as they had close to 40 new PTAs with a variety of trading partners entering into force during the sample period.

Figure 9.1 shows that, around the world, the number of PTAs including SPS and TBT provisions has increased over time. To date, 88% of PTAs currently notified to the WTO cover SPS provisions, and 86% cover TBT provisions. Of the PTAs signed by Chile, Colombia, and Peru, as of 2017, more than 80% covered SPS and TBT provisions. Two of the deepest PTAs that include a high number of essential provisions are the Peru-Chile PTA (2009) and the Chile-Mexico PTA (1999).

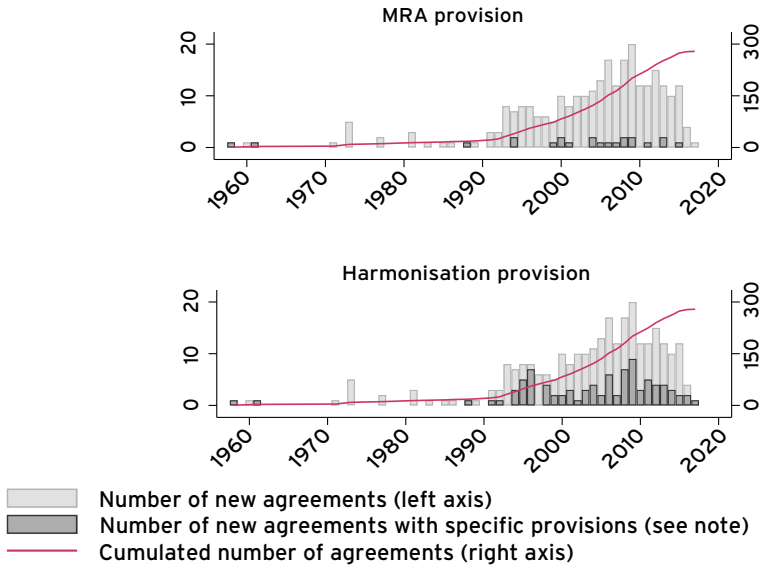**FIGURE 9.1   SPS AND TBT PROVISIONS IN PREFERENTIAL TRADE AGREEMENTS**
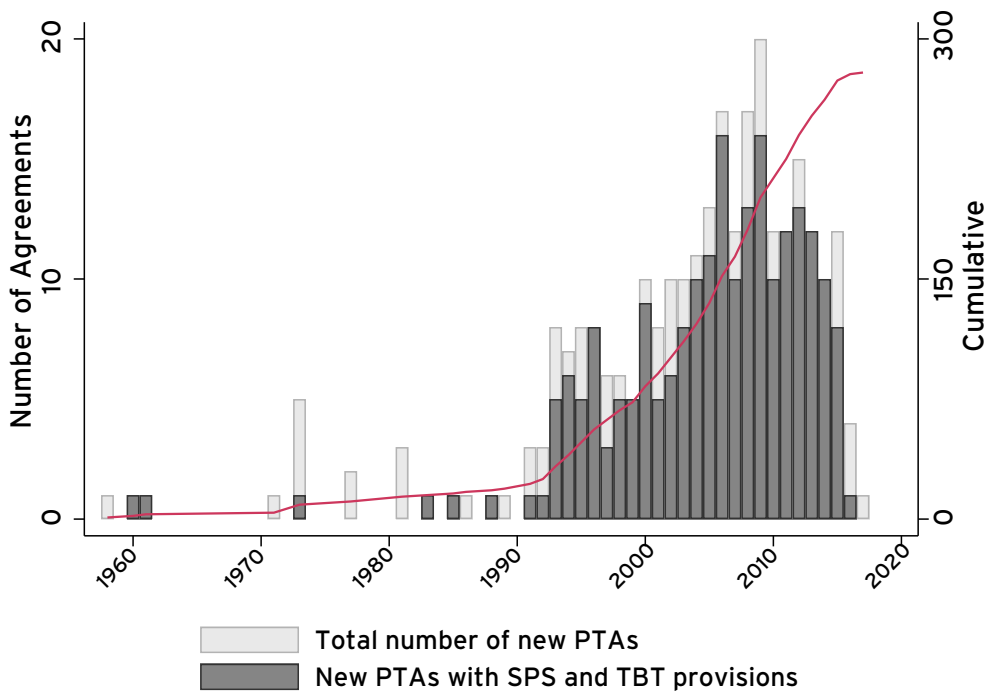
Notes: The graph plots the number of new PTAs entering in force over the period 1958–2017 that include at least one provision on SPS or TBT. The red line shows the cumulative number of PTAs.

Source: Mattoo et al. (2020).

With respect to the approach followed in the PTAs to integrate SPS, Figure 9.2 (panel a) shows that globally, harmonisation provisions are more prevalent than mutual recognition provisions. This is the case for Chile, Colombia, and Peru: harmonisation of SPS is more prevalent (included in 22 out of the 38 PTAs signed), while mutual recognition is present in only five of those PTAs. In contrast, with respect to the approaches to integrate TBT, Figure 9.2 (panel b) shows that globally, both harmonisation and mutual recognition provisions are very rare. For our countries of interest, only the EFTA-Peru (2011) includes harmonisation and mutual recognition of TBT.

FIGURE 9.2   SPS AND TBT MUTUAL RECOGNITION AND HARMONISATION PROVISIONS IN PTAS

Panel a: SPS

Panel b: TBT
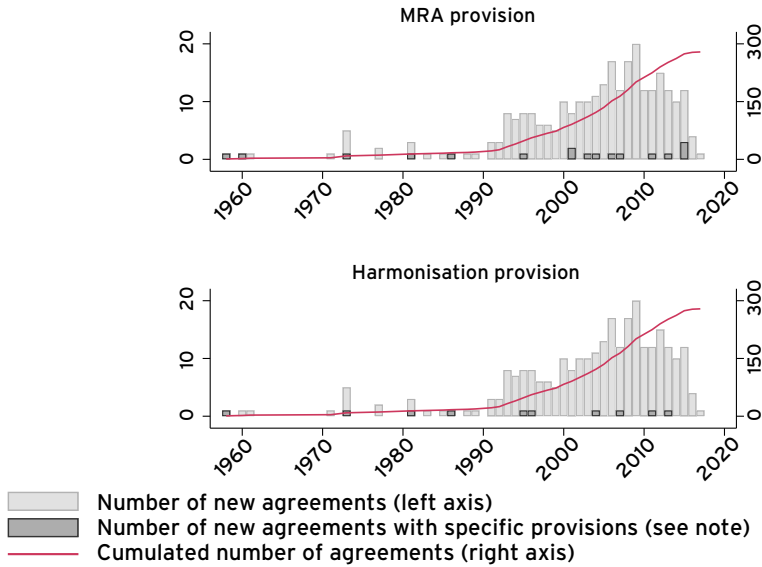
Notes: The graph plots the number of new PTAs entering in force over the period 1958–2017. It disentangles PTAs including at least one provision on mutual recognition of SPS (upper-left), PTAs including at least one provision on harmonisation of SPS (upper-right), PTAs including at least one provision on mutual recognition of TBT (bottom-left) and PTAs including a least one provisions on harmonisation of TBT (bottom-right). The red line shows the cumulated number of PTAs.

Source: Mattoo et al. (2020).

DO SPS AND TBT PROVISIONS IMPACT EXPORTS DIFFERENTLY ACROSS FIRM SIZE?

Our empirical results show clear evidence that exports of firms in Chile, Colombia, and Peru benefit from the inclusion of SPS and TBT provisions in PTAs, but the benefit depends on the size of the firm. Our firm size measure divides the sample into three mutually exclusive size terciles defined by the market share that each firm has in a destination-product market in its initial year in the sample.

The left panel of Figure 9.3 shows that upon entry into force of a PTA with the maximum number of SPS and TBT provisions (like the Chile-EU PTA), agro and food exports by smaller firms increase on average by 26%, whereas those of larger firms do not increase significantly. The right panel of Figure 9.3 shows that exports by smaller firms increase on average by 40% due to the entry into force of PTAs with more TBT provisions, whereas the increase for larger firms is close to 10%. These results are obtained after controlling for the depth of all other provisions as well as for tariff liberalisation also brought on by such PTAs.

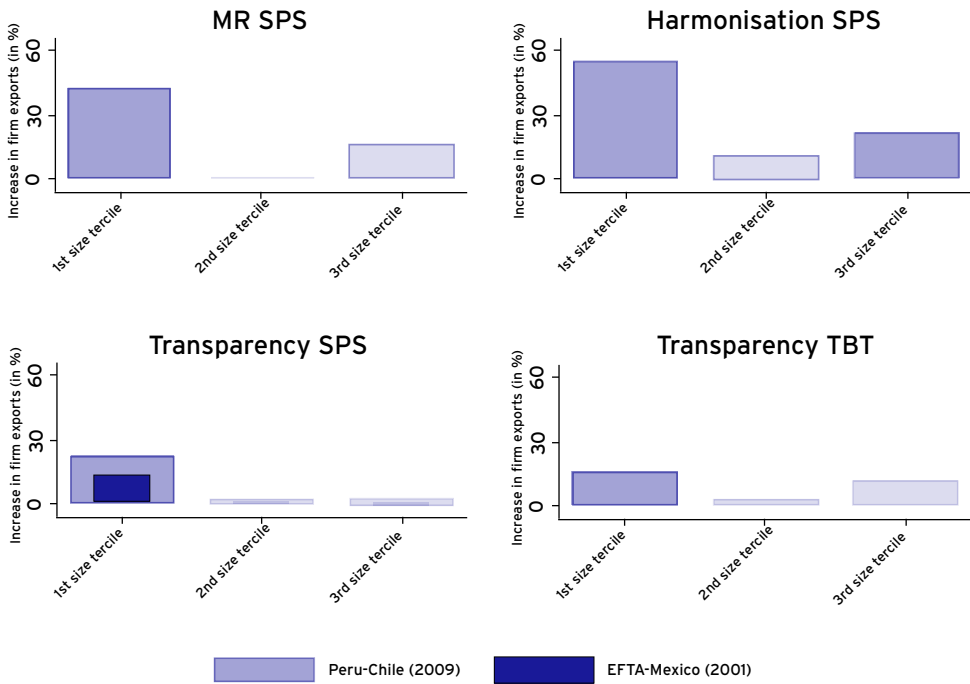**FIGURE 9.3   ESTIMATED EFFECTS OF SPS PROVISIONS IN PTAS ON FIRM EXPORTS ACROSS SIZE CATEGORIES**
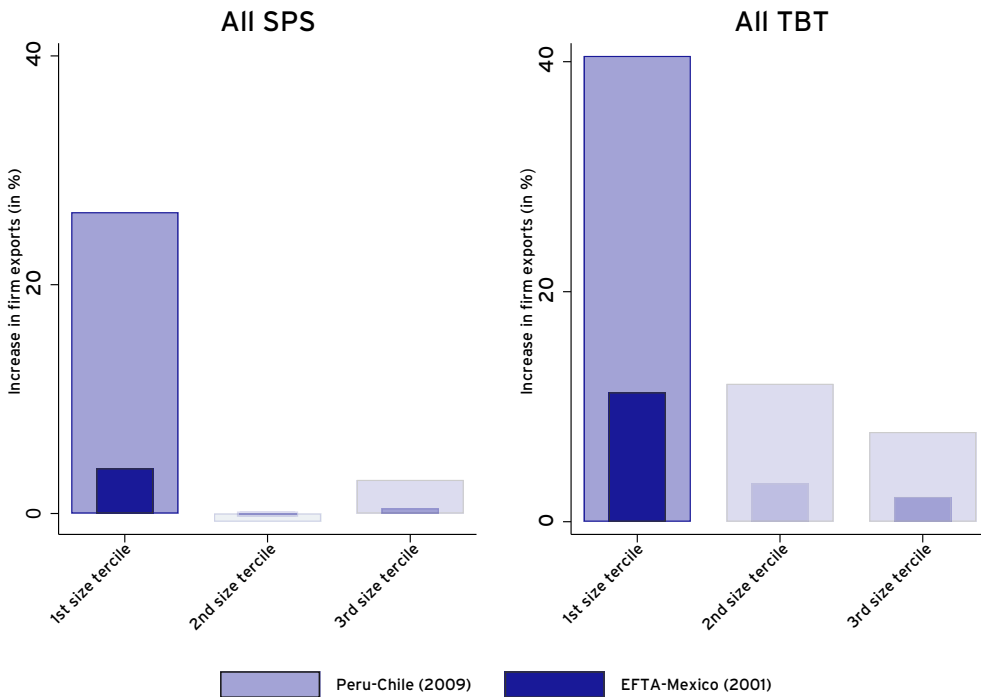
Notes: The graphs use the estimated coefficients from gravity regressions in Fernandes et al. (2021) on the interactions between either the total number of SPS or of TBT provisions and three firm-size categories to construct the changes in firm exports from increasing, respectively, the number of SPS or TBT provisions to those in the Peru-Chile PTA (a deep PTA in terms of SPS and TBT) or the EFTA-Mexico PTA (a shallow PTA in terms of SPS and TBT).

Further exploring the impact of SPS provisions in PTAs separately across animal products, vegetable products, and processed food, we find that the stronger impact of such provisions on smaller firms is prevalent in all sub-sectors.

WHAT IS THE ROLE OF MUTUAL RECOGNITION, HARMONISATION, AND TRANSPARENCY OF SPS AND TBT PROVISIONS IN PTAS?

To investigate what type of integration of SPS and TBT among PTA partner countries is most conducive to firm export growth, we consider provisions on the mutual recognition and harmonisation of SPS and TBT. The evidence shows PTAs that include provisions for the harmonisation of SPS regulations boost agro and food exports substantially more for smaller firms selling to destination markets than for larger firms selling in those markets. The boost to the exports of smaller firms when PTAs mutually recognise SPS regulations is also stronger than that to exports of larger firms.

FIGURE 9.4   ESTIMATED EFFECTS OF SPS PROVISIONS IN PTAS ON FIRM EXPORTS ACROSS SIZE CATEGORIES

Notes: The top two graphs use the estimated coefficients from gravity regressions in Fernandes et al. (2021) on the interactions between a dummy variable for either mutual recognition or harmonisation of SPS provisions and three firm-size categories to construct the changes in firm exports from entering into a deep PTA (Peru-Chile) which includes mutual recognition and harmonisation of SPS provisions. The bottom two graphs use the estimated coefficients on the interactions between either the total number of SPS or of TBT transparency provisions and three firm-size categories to construct the changes in firm exports from increasing, respectively, the number of SPS or TBT transparency provisions to those in the Peru-Chile PTA or the EFTA-Mexico PTA.

Transparency provisions in PTAs concern the publication and notification of SPS and TBT regulations and the information (mostly scientific) on which they are based. Such provisions could be important to reduce information asymmetries across firms and uncertainty on SPS and TBT regulations across firms. They can also prevent governments from implementing SPS or TBT regulations without scientific evidence. The bottom panels of Figure 9.4 show that exports of smaller firms to destination markets increase significantly more than exports of larger firms upon the entry into force of PTAs with stronger SPS or TBT transparency provisions.

CONCLUSION

PTAs including provisions on SPS and TBT and on their integration and transparency across member countries may provide a useful vehicle to minimise regulatory divergence across countries, thus helping to reduce trade costs and facilitate trade. Evidence for firms in Chile, Colombia, and Peru in 1996–2015 shows this is the case. Importantly, the benefits to firm exports are substantially stronger for the smaller exporters.

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SERVICES TRADE AND STATE INTERVENTION

CHAPTER 10

Scoping services trade agreements: What really matters

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The emergence of value-chain trade and advances in digital technology over the last decades have transformed how services can be produced, consumed, and traded across borders. These trends have coincided with a proliferation of increasingly ambitious preferential trade agreements (PTAs) that, in addition to liberalising goods trade, also contain chapters on services,[1] movement of people, and governance of data flows, amongst many other aspects. These two developments have likely evolved in a mutually reinforcing manner. Waves of unbundling stages of production, and tasks within stages, have increased the need for services to be traded (Baldwin and Lopez-Gonzalez 2015, Ariu et al. 2019). Ever-deeper services PTAs were part of the trade policy response to this requirement, and the surge in bilateral and plurilateral agreements partly also reflected the impasse over a multilateral Trade in Services Agreement under the auspices of the WTO. As services PTAs spread, the very existence of these agreements has underpinned the observed growth of services trade.

By 2016, over 120 economies were signatories to at least one services PTA. At the top are Chile and Singapore, which are each party to 20 services PTAs, followed by South Korea, which has concluded 15 such agreements. Due to the proliferation of services PTAs, the majority of cross-border services trade is currently transacted under preferential terms, i.e. is exchanged between economies that have signed a PTA with provisions that liberalise cross-border trade and investment in services.[2] However, the engagement with services PTAs has been highly unequal. For instance, whereas Australia and China have greatly increased the number of partners with which they have signed a services PTA, there was no change at all over the 2000–16 period for Brazil and South Africa (Figure 10.1).[3] Overall, the regions in which countries have been most active in signing services PTAs since 2000 are Europe, Asia and the Pacific, and North America.[4]

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1   Henceforth, we will refer to PTAs with services chapters or provisions as 'services PTAs'.
2   Two notable exceptions are the US and Japan, which trade services extensively with EU member states, but as of 2016 neither country had a services PTA in place with the EU.
3   When countries sign or join plurilateral agreements, their connectivity displays a discrete jump, as is apparent from Figure 1 when China signed a PTA with ASEAN in 2007, as did Australia (jointly with New Zealand) shortly afterwards in 2010.
4   The EU is party to 14 agreements, as is Japan; China, Peru, and the US each have 13, and Australia and New Zealand have signed 10 services PTAs.

FIGURE 10.1   INCREASING NUMBER OF BILATERAL PAIRS COVERED BY SERVICES PTAS, 2000-16, SELECTED ECONOMIES
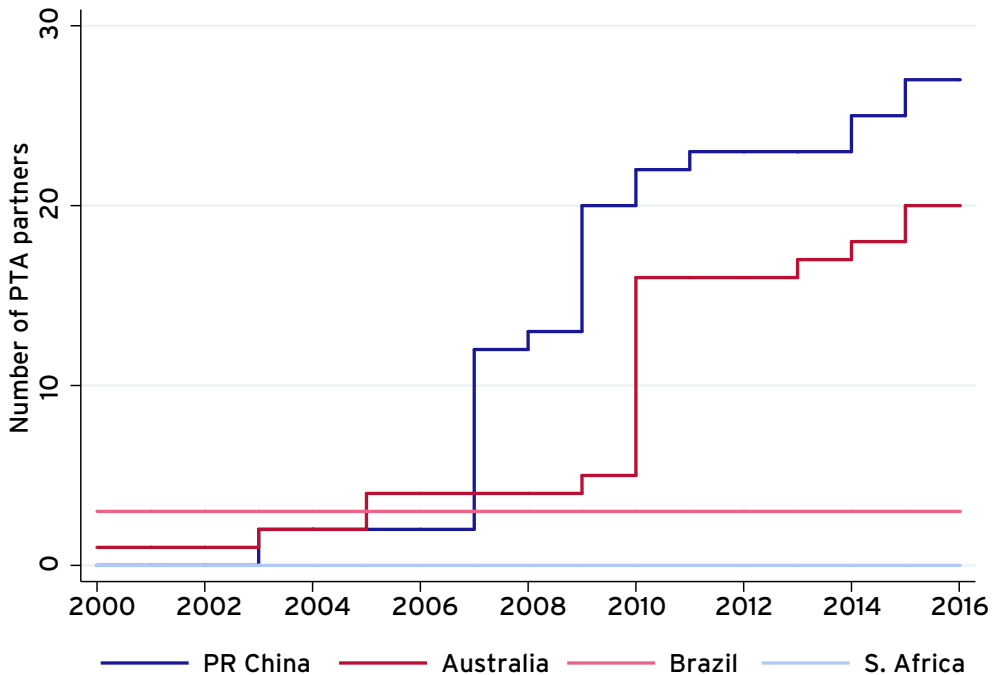
Source: World Bank Deep Trade Agreements database (Mattoo et al. 2020) and authors' calculations.

DO SERVICES PTAS MAKE A DIFFERENCE?

For a long time, the analysis of services PTAs has been hampered by a paucity of data both on the policy side, in terms of contents of trade agreements, and also on the statistical side, in terms of bilateral sectoral services trade flow data. Most recently, progress has been made on both fronts. On the one hand, much better services trade statistics have become available. On the other hand, and even more importantly, datasets with information on the kind of provisions contained in trade agreements started to become available.[5] This advancement has enabled researchers to go beyond estimating overall agreement effects on services trade, which had been found to be positive (Guillin 2013, Park and Park 2011), and instead focus on specific characteristics of PTAs, including their depth (Baier et al. 2018, Mulabdic et al. 2017, Mattoo et al. 2017, Baier et al. 2014). Dhingra et al. (2018) find that services, investment, and competition provisions are those most effective at lowering trade barriers. Between them, such provisions account for 60% of the overall effect of trade agreements on exports. Using the count of legally enforceable provisions per PTA as a measure of its depth, Dhingra et al. (2021) find that deep PTAs boost services trade

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5   The Design of Trade Agreements Database (Dür et al. 2014) and the database by Horn et al. (2010), updated by Hofmann et al. (2017) and known as the World Bank Deep Trade Agreements 1.0 (horizontal depth) database.

by about 30% compared to shallow agreements. In terms of the role of services in value chains, there is also evidence that deep trade agreements increase global value chain activity in both goods and services trade (Laget et al. 2020, Osnago et al. 2019, Dhingra et al. 2018, Andrenelli et al. 2018, Orefice and Rocha 2014).

The granular information contained in the 'Services' chapter of the World Bank Deep Trade Agreements database (Mattoo et al. 2020) enables us to go further. Unlike previous work pointing to the relevance of the presence of a services chapter per se, in a recent study (Borchert and Di Ubaldo, 2021) we identify which aspects of the structure and depth of services PTAs affect cross-border services trade, and by how much. We also show in detail how deep agreements affect the sourcing of services value added from PTA partners. We exploit policy information from Gootiiz et al. (2020) on services PTAs that came into force from 2000 onwards and match it with data on bilateral sectoral services trade flows from the newly released International Trade and Production Dataset for Estimation, which is the most comprehensive services trade dataset currently available (Borchert et al. 2021). Information on services value added in services exports and in overall exports is taken from the 2018 edition of the Trade in Value Added (TiVA) indicators.

The richness of these data matters. The mere existence of a services PTA alone is not associated with significant effects on services trade or value added, which we attribute to the demanding fixed-effects structure applied in all our estimations.[6] However, once we set up the analysis to detect the effects of specific provisions in areas vital for services trade, such as the structure of an agreement, rules of origin for service suppliers, or accountability, we find significant effects. Figure 10.2 demonstrates that ambitious policy configurations are associated with increases in services trade by 15–65%, depending on the policy area, whereas shallow combinations have no discernible effect.[7] 'Agreement structure' refers, for example, to the liberalisation approach (positive or negative list) whereas 'rules of origin' define criteria for firms and natural persons to belong to a PTA partner.

These findings show that only agreements with ambitious structure, meaningful disciplines, and accountability affect services exports significantly. Correspondingly, the results are driven by trade in regulation intensive services such as financial and business services and the exchange of intellectual property rights.

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6   The inclusion of these fixed effects mitigates the concern of overestimating trade effects because countries' participation in PTAs is evidently not random; rather, economies with certain features may self-select into signing a services PTA.

7   These trade effects represent reduced-form, partial equilibrium effects.

**FIGURE 10.2   TRADE EFFECT OF POLICY CLUSTERS IN SERVICES PTAS, 2000-16**
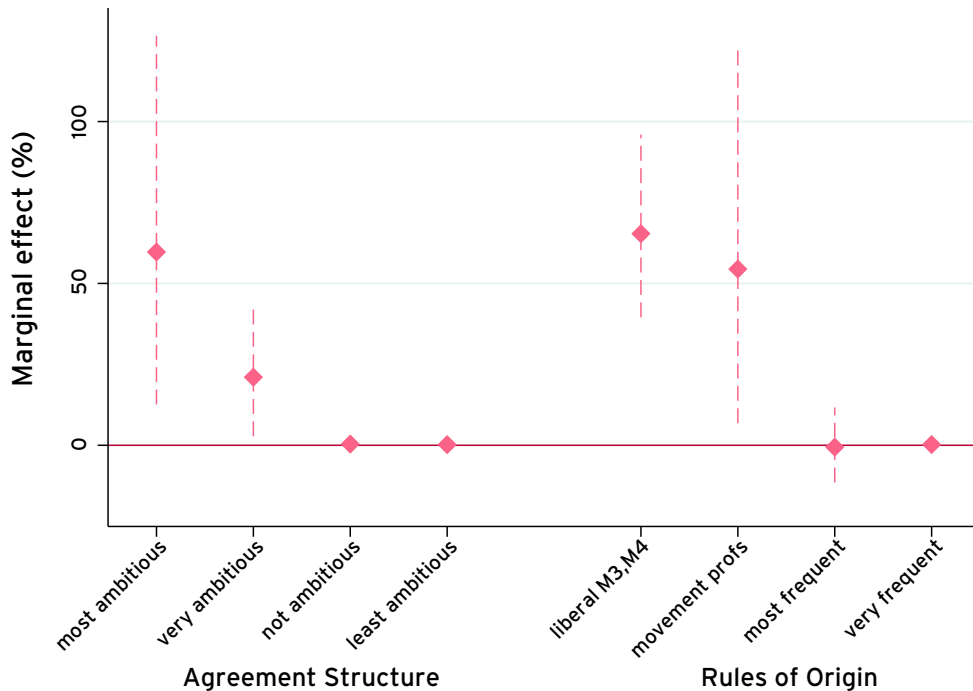
Source: Authors' calculation using World Bank Deep Trade Agreements (Mattoo et al. 2020) and International Trade and Production Dataset for Estimation data. Dependent variable in the underlying estimations: bilateral services trade. PPML estimation with three-way clustered standard errors and full sets of exporter-year, importer-year and country-pair fixed effects, respectively. Other policy patterns controlled for but not reported.

THE SOURCING OF SERVICES VALUE ADDED

Services PTAs also affect the sourcing pattern of value added that is embodied in a country's exports. Economies tend to import relatively more foreign services value added from within services PTAs, as compared to value added imported from non-PTA partners. Hence, in addition to direct trade effects, services PTAs also increase the contribution of foreign services value added. In particular, individual agreement provisions that relate to investment flows and the movement of people can be associated with substantially higher foreign services value added in exports of PTA partners (Figure 10.3), relative to non-PTA countries.

For instance, in agreements with liberal definitions as to which firms and services professionals qualify to benefit from the PTA (Mode 3 and Mode 4 services trade, respectively) the share of services values added from PTA partners is between 15–35% higher (top three entries in Figure 10.3). Again, as in Figure 10.2, the effect of unambitious provisions is essentially nil (bottom half of Figure 10.3). Because higher embodied services value added is associated with provisions that facilitate the exchange of capital and people, these results shed light on how services PTAs can affect the configuration of value-chain trade.
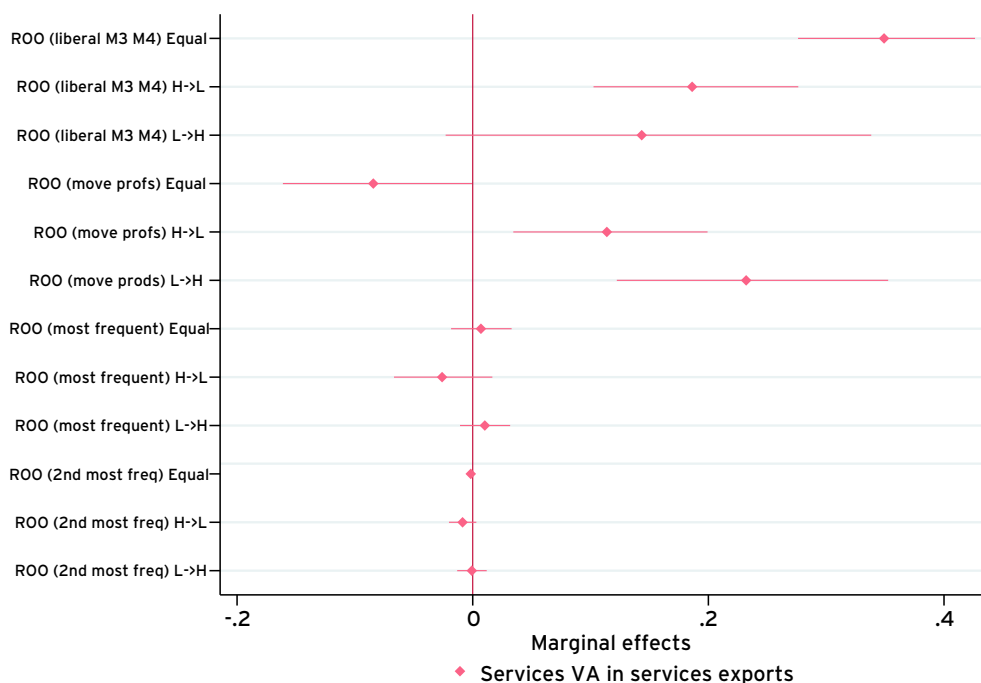
Source: Authors' calculations using Trade in Value Added data (TIVA 2018) and World Bank Deep Trade Agreements (Mattoo
et al. 2020).

CONCLUSIONS

The question of how to design effective trade agreements is of eminent interest to
policymakers. Which provisions, combinations of provisions, or design features of services
trade agreements really boost services trade? Exploiting detailed policy information from
143 agreements with services chapters enables us to show which aspects of PTA depth
really matter. The effects on bilateral services trade range from 15–65%. A deep dive into
specific provisions traces these effects to such aspects as agreement structure, rules of
origin, or provisions that ensure accountability. Services PTAs also lead to more services
value added sourced from PTA partners, at the expense of non-PTA partners and domestic
value added. Hence, our analysis sheds light on the features that are instrumental in
rendering services PTAs a powerful force for shaping trade and value added in services.

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CHAPTER 11

Trade barriers in government procurement

Alen Mulabdic and Lorenzo Rotunno

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Government procurement is a major market, accounting for about 12% of world GDP. Given its sheer size, it is no surprise that governments often use public procurement to serve socioeconomic and political objectives (e.g. supporting small and medium-sized companies, boosting local employment), which might clash with principles of cost minimisation. One consequence is that foreign firms face limited access to procurement markets. In some cases, governments explicitly restrict the participation of foreign firms in government procurement. One of the first executive orders of the Biden US administration in January 2021 was to tighten the rules for purchases of foreign-made products by federal authorities (Hayashi 2021). At the world level, data from the Global Trade Alert initiative show that 56 new 'buy-national' measures have been enacted on average every year since 2009.

In parallel with this propensity to buy local, governments have committed to greater market access in public procurement through the WTO Government Procurement Agreement and preferential trade agreements. Membership to the WTO Government Procurement Agreement expanded from the initial 34 signatory countries in 1996 to a group of 48 as of 2020. Meanwhile, the number of trade agreements including enforceable provisions aimed at liberalising procurement markets has been increasing over time. Figure 11.1 shows that provisions on government procurement have become more common since 2000. In 2017, a quarter of trade agreements in force had enforceable provisions on government procurement.

In Mulabdic and Rotunno (2021), we quantitatively assess barriers to cross-border government procurement and identify the role of trade agreements in reducing them. In light of a seemingly contradicting policy landscape where unilateral discriminatory measures are adopted together with plurilateral liberalising ones, how 'national' is government procurement? Are public authorities becoming more or less home biased than firms when it comes to their purchasing strategies? And have specific provisions in deep trade agreements contributed to liberalising government procurement markets?

We address these questions by estimating a standard gravity model for cross-border procurement flows and trade flows in private markets. Data from the Trade in Value Added (TiVA) inter-country input-output tables between 1995 and 2015 are used to

construct the value of purchases by public authorities, by county of origin and sector. To identify the distinctive role of bilateral (i.e. specific to a country pair) factors in explaining cross-border procurement, we systematically compare the estimates obtained with public procurement flows to those obtained with comparable flows involving only private firms.

FIGURE 11.1   NUMBER OF TRADE AGREEMENTS WITH AND WITHOUT ENFORCEABLE PROVISIONS IN GOVERNMENT PROCUREMENT
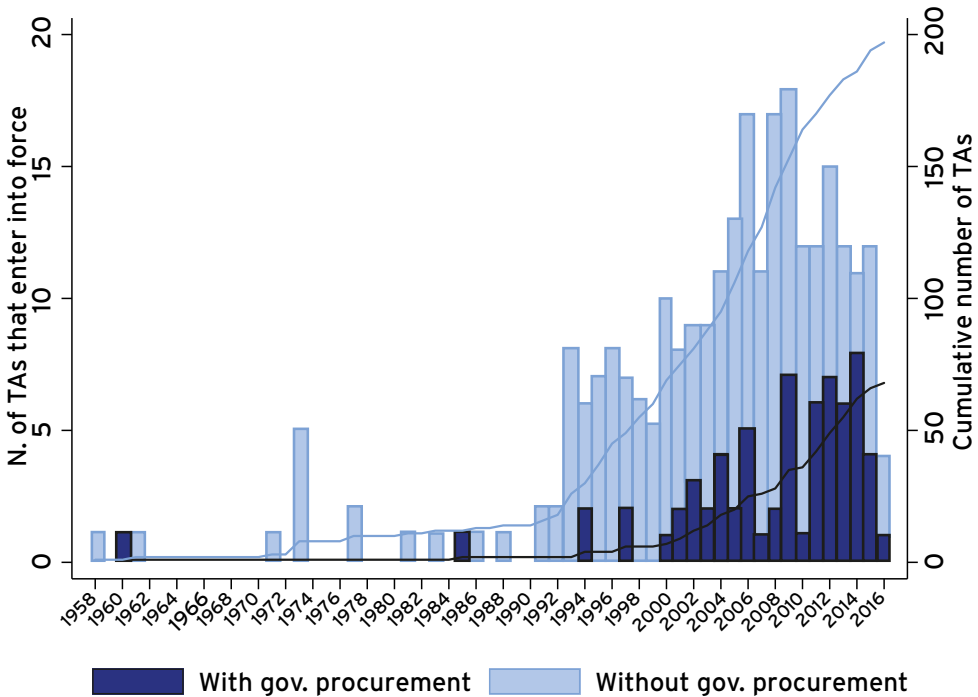
Source: Mulabdic and Rotunno (2021).

Our work contributes to a relatively scant but recently active strand of studies on government procurement and international trade. A handful of these studies exploit contract-level data mainly from the US and the EU to assess the local bias in public purchases. Using EU data, Herz and Varela-Irimia (2020) find large border effects both across and within European countries adopting a gravity-style estimation approach.[1] Fronk (2014) estimates the effect of trade agreements in a gravity model using US federal procurement data – as such, he has one buyer (the US) from multiple suppliers. While precisely measuring procurement purchases, the contract-level data cover only a single or a few countries and hence do not permit the investigation of the effect of trade agreements

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1   Kutlina-Dimitrova and Lakatos (2014) provide evidence indicating that product-market regulation and policies on foreign direct investments affect the probability of awarding a procurement contract to a foreign firm. Gourdon and Messent (2019) estimate the effect of trade agreements on the value of procurement contracts awarded by the EU on non-EU firms using both contract-level and aggregate data. Their set of trade agreements is thus limited to those signed by the EU.

and their provisions, which is a focus of our paper. We overcome this limitation by using instead inter-country input-output tables to measure government procurement flows, a source of data that has already been used to measure such flows (Trionfetti 2000, Riker 2013).[2]

DATA AND EMPIRICAL STRATEGY

Our empirical analysis rests on an indirect measure of government procurement flows obtained by the inter-country input-output tables of the TiVA database. We follow the European Commission (2017) and define government procurement as the sum of the 'general government expenditures' and 'public administration', 'health', and 'education'. Importantly, the inter-country input-output tables provide us with measures of both domestic and cross-border procurement as well as private markets.

We find that government procurement is mainly in services. The average country in our sample spends 90% of its procurement money on services; in private markets, this share is around 50%. Focusing on imports in government procurement and in private markets, we compute import penetration ratios defined as the value of imports divided by total expenditures, by country and type of purchasing entities (public or private). Figure 11.2 shows the distribution of the ratio of public to private import penetration ratios for goods and services. A value greater than one suggests that public markets are more open than private ones – i.e., the ratio of imports in total expenditure is relatively higher in public markets than in private. In services, public markets are less open than private ones, while for goods, the picture is more nuanced. Between 1995 and 2015, the relative openness of government procurement in services increased, whereas it slightly decreased on average for goods.

To move beyond descriptive evidence and estimate trade barriers in government procurement, we apply a canonical gravity framework relating bilateral cross-border procurement flows to different variables proxying for trade costs (or their inverse) and multilateral resistance terms. The gravity model achieves three purposes. First, it delivers an estimate of the 'border effect': how much national borders impede international trade and hence disproportionally raise the value of domestic transactions. This is a first measure of home bias, which, in the case of government procurement, might well depend on policies that have little to do with trade (e.g. 'set-aside' policies that provide preferential access to specific categories of firms that are national by definition, such as veteran- and Native-owned firms in the US).

2   Inter-country input-output data have already been used in gravity estimation, e.g. by Fajgelbaum and Khandelwal (2016).

FIGURE 11.2   DISTRIBUTION OF GOVERNMENT IMPORT PENETRATION OVER PRIVATE IMPORT PENETRATION
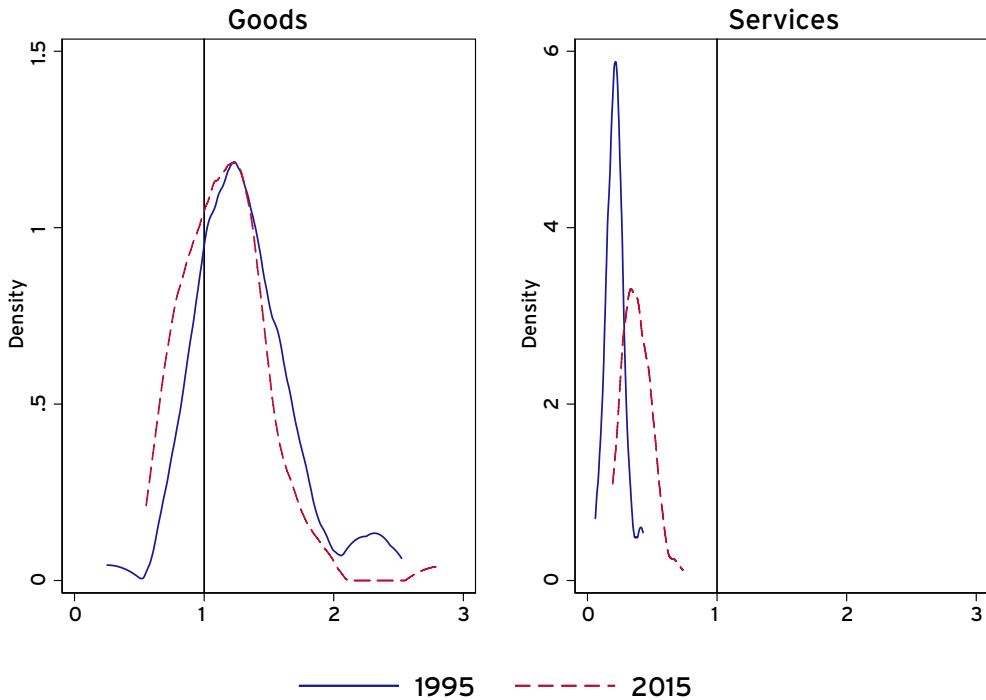
Source: Mulabdic and Rotunno (2021).

Second, it allows us to identify the trade effect of bilateral trade policies, such as participation in trade agreements. We leverage information on the content of preferential trade agreements from the World Bank Deep Trade Agreement database to construct indicators for the presence of provisions specific to government procurement (Mattoo et al. 2020). The database contains 100 questions used to code aspects related to government procurement. After cleaning mutually excluding questions from the list, we end up with 39 provisions that cover seven areas: overview, non-discrimination, coverage, procedural disciplines, transparency, dispute settlement, and new issues.

We first use a simple indicator that identifies trade agreements with any provisions on government procurement. Then, we test the role of different provisions. In the gravity specifications, we control for the presence of trade agreements without a chapter on government procurement as well as for the role of the WTO Government Procurement Agreement and the EU. The WTO agreement is the largest trade agreement specific to government procurement. Its provisions are often repeated in deep trade agreements, so the effects of trade agreements in general and the WTO agreement might overlap. The EU is undoubtedly the deepest trade agreement and its 28 members (in the sample period) represent almost half of the country sample. We thus single it out from the other trade agreements with provisions on government procurement.

Third, the gravity framework provides a broader measure of home bias than the border effect. The Constructed Home Bias index proposed by Anderson and Yotov (2010) equals the ratio of the gravity-predicted observed domestic trade to the value of domestic trade that would be predicted in a counterfactual free-trade scenario. It thus measures how trade barriers of all kinds around the world inflate domestic trade over what we would observe in a frictionless world. We estimate this index as a measure of incidence of trade costs, keeping constant the level of aggregate sales and expenditure.

RESULTS

We first estimate a gravity specification with bilateral and time-invariant determinants of trade flows (e.g. common colonial history, common language, contiguous borders, common legal origin, distance) and importer-year and exporter-year fixed effects that control for the multilateral resistance terms. Our focus is on the 'same-country' dummy, which equals 1 for internal trade, as its coefficient measures the border effect. We find a massive border effect, which is significantly greater in public than in private markets for services (for goods, the difference is not statistically significant).

The next step is to estimate our preferred empirical specification, which includes bilateral fixed effects absorbing the influence of all time-invariant determinants of trade. This model allows us to identify the effect of trade agreements. We find that specific provisions included in the agreements distinctively increase cross-border government procurement in services relative to trade in services in the private sector. Our estimates suggest that cross-border procurement in services is 77% higher when two countries are part of a trade agreement with provisions on procurement. As expected, the effect is reduced when we control for membership in the WTO Government Procurement Agreement; it is halved when we additionally take EU membership into account. The results point to an important effect of EU entry on government imports of both manufacturing and services. According to our findings, trade in public markets between two countries is 40% (for goods) to 60% (for services) higher when both are EU members. As for the WTO Government Procurement Agreement, we also find robust effects. These findings are specific to services, where the bulk of procurement money is spent.

Additional results suggest that the trade-creating effect of trade agreements is driven by 'unilateral' provisions – i.e. for which it is difficult to exclude firms located in non-member countries. Two pieces of evidence support this finding. First, we estimate the effect of each of the 39 provisions on government procurement. While the clustering of provisions makes the interpretation of the findings purely suggestive, measures aimed at fostering transparency and sharing of information (e.g. possibility of e-procurement, availability of statistics on government procurement) have the largest impact on bilateral trade. These provisions have a strong public-good component – e.g. firms from non-member countries can also have access to enhanced statistics and information available on government websites.

Therefore, in a second step, we group these provisions that are clearly non-discriminatory across trading partners (they concern transparency and procedural matters) in a country-specific measure of unilateral 'depth' of trade agreements. To identify its effect in our gravity model, we follow recent work on unilateral trade policies (Heid et al. 2021, Beverelli et al. 2018) and add to our baseline specification the interaction of the country-specific unilateral depth variable with the same-country dummy. The coefficient on this interaction measures how much unilateral provisions alter the border effect. We find that the border effect in government procurement of services is significantly lower in countries with a higher unilateral depth of trade agreements.

Finally, the Constructed Home Bias index estimates confirm what anecdotal evidence and the border-effect estimate suggest: home bias in government procurement is large and higher on average than in private markets. The difference is less striking when we look at goods and services separately than when we aggregate up to the country level. This suggests that governments are more home biased than the private sector because (i) they source more goods and services locally; and (ii) they spend more in sectors that are more home biased.

Figure 11.3 plots the variation in the Constructed Home Bias over time for each country in our sample. Home bias in government procurement went down for most countries, but important heterogeneity emerges. The developing countries in our sample, including China, India, and Vietnam, experienced the largest declines in home bias, whereas government procurement has become more national in most developed economies, such as France, Germany, and Japan – which however have also the lowest levels of Constructed Home Bias to start with.

DISCUSSION

As expected, government procurement is more home biased than purchases in private markets. This preference for local firms can come from both protectionist policies and specific features of government procurement related to socioeconomic and political objectives. Over time, however, the evidence suggests that government procurement markets are becoming relatively more open to foreign suppliers. Trade agreements with provisions on government procurement might have contributed to this decline in home bias.

Our analysis shows that national borders in government procurement are relatively thicker in services (relative to private markets), which absorb the lion share of public spending. Furthermore, we find that policies targeting government procurement can reduce trade barriers in services. These findings highlight potential complementarities between trade negotiations on services and government procurement. Serious and substantial service trade liberalisation can have important liberalising knock-on effects on government procurement.

FIGURE 11.3 RELATIVE CHANGE IN CONSTRUCTED HOME BIAS INDEXES AT THE COUNTRY LEVEL BETWEEN 1995 AND 2015.
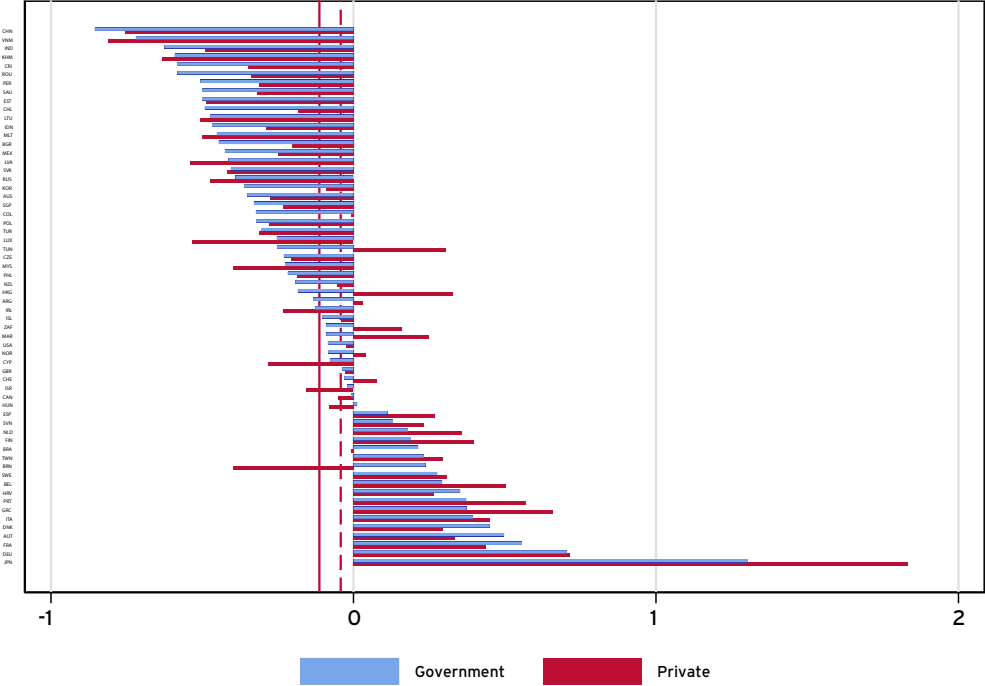
Source: Mulabdic and Rotunno (2021).

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CHAPTER 12

The spillover effect of deep trade agreements on Chinese state-owned enterprises

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The rapid rise of China and the uniqueness of its economic structure was largely unforeseen by those negotiating multilateral trade rules (Wu 2016, Mavroidis and Janow 2017). As a result, Chinese specificities – the outsized presence of the state in the Chinese economy and the management of state-owned enterprises (SOE) with their explicit or implicit ties to the government – largely fall outside the scope of the current jurisdiction of the WTO. Not surprisingly, issues concerning SOEs and the role of state intervention in China have emerged as points of tensions in the WTO system in recent years (Bown and Hillman 2019, Lang 2019).

At the same time, many countries have increasingly regulated SOEs, and state intervention more broadly, within preferential trade agreements (PTAs). While there are important differences across agreements, two out of three PTAs in force in 2018 have some form of regulation of SOEs (Rubini and Wang 2020). Some scholars view the development of rules within PTAs as a path to deal with the challenges created by the rise of China (Bhala 2017, Wu 2016). This idea emerged most clearly throughout the negotiations of the Trans-Pacific Partnership (TPP). As one scholar put it: in the eyes of the negotiators "TPP serves as a 'building block' for developing new trade rules – China would then need to choose whether to embrace these rules eventually or risk displacement from the new preferential trade arrangements" (Wu 2016). While TPP did not come into existence, its successor, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership retained rules on SOEs.

In our recent work (Lefebvre et al. 2021), we investigate whether PTAs are an alternative way to address the trade concerns created by Chinese specificities. Addressing this question presupposes an understanding of a more proximate issue. How do PTA rules on SOEs and state intervention more broadly affect Chinese SOEs? To tackle this issue, we combine the information on the content of PTAs from the World Bank (Mattoo et al. 2020) with Chinese firm-level exports to analyse the impact of SOE rules on the intensive and extensive margins of Chinese SOEs' trade. We find that rather than containing

state capitalism, PTAs regulating SOEs signed by Chinese trading partners with third countries increase exports and entry of Chinese SOEs as they gain a competitive edge in regulated markets.

## RULES ON STATE-OWNED ENTERPRISES IN PTAS

To investigate the effects of third-country PTAs on the export performance of Chinese SOEs, we use new information on the content of 'deep' trade agreements from the World Bank. The database maps the content of 279 PTAs signed between 1958 and 2018. Among other policy areas, the database provides detailed information on the rules regulating SOEs in PTAs. The upward trend in the depth of trade agreements that is well documented in the literature (Mattoo et al. 2020) also applies to PTAs regulating the behaviour of SOEs (Figure 12.1). While only one out of seven PTAs that entered into force in 1995 included more than 15 SOE provisions, six out of 12 PTAs that entered into force in 2015 appear to go deeper than this threshold. Although the number and scope of trade agreements regulating SOEs are globally on the rise, the contribution of China appears to be very modest. Indeed, China signed few trade agreements (16 in total), which rarely include regulations on SOEs. The recently signed Regional Comprehensive Economic Partnership, of which China is a party, does not foresee any regulation of SOEs. Most of the trade agreements regulating SOEs are signed between third countries, potentially generating spillovers for Chinese exports.

The goal of SOE regulations in trade agreements is generally to prohibit or to mandate a certain type of behaviour, such as discrimination, trade distortions, anticompetitive practices, in order to guarantee a level playing field. Table 12.1 is a selected list of SOE provisions that are typically included in PTAs. While the GATT/WTO agreement has some basic discipline in this area, the scope of PTAs on SOEs often goes beyond the rules in the multilateral system. To ensure that the rules are respected, the legal language in which they are written can be more precise and binding, and the PTA can mandate dispute settlement to settle controversies between the parties of the agreement. Table 12.1 illustrates the frequency to which provisions included in SOEs go beyond the scope of the WTO regulation ('WTO+') and are considered enforceable ('Enf.').

TABLE 12.1   WTO+ AND ENFORCEABLE SOE PROVISIONS

WTO+	Enf.	SOE Provisions Description
14.2%	0.3%	Does the agreement expressly regulate/exclude state entreprises in financial services?
88.8%	0.2%	Does the agreement expressly regulate/exclude state entreprises pursuing public services?
28.5%	0%	Does the agreement expressly regulate/exclude SOE in strategic sectors (e.g. energy, IT/telecom, transport)?
7.14%	0.7%	Does the agreement include any public procurement provision for state entreprises?
42%	21.7%	**Does the agreement regulate ownership or property regimes, or liberalization processes?**
4.8%	39.5%	**Does the agreement prohibit discrimination by state entreprises?**
0%	19.2%	**Does the agreement require state entreprises to act in accordance with commercial considerations?**
0.06%	39.8%	**Does the agreement regulate subsidization to state entreprises?**
87.5%	33%	**Does the agreement prohibit anti-competitive behaviour of state entreprises?**
50%	6.4%	Does the agreement require state entreprises not to distort trade?
33.3%	0.7%	Does the agreement indicate the geographical market where the objectionable conduct or the effect takes place?
83.3%	8.5%	Does the agreement provide for exceptions specific to state entreprises?
94%	7.4%	Does the agreement require transparency of ownership, governance and financial information?
100%	5.6%	Does the agreement include corporate governance requirements (about 'structure' or 'behaviour')?
5.7%	25.6%	Does the agreement provide for any dispute settlement mechanism to deal with state entreprises?
50%	0%	Does the agreement provide for any other special and differential treatment with respect to state enterprises?

FIGURE 12.1   SOE DEPTH OF TRADE AGREEMENTS, OVER TIME
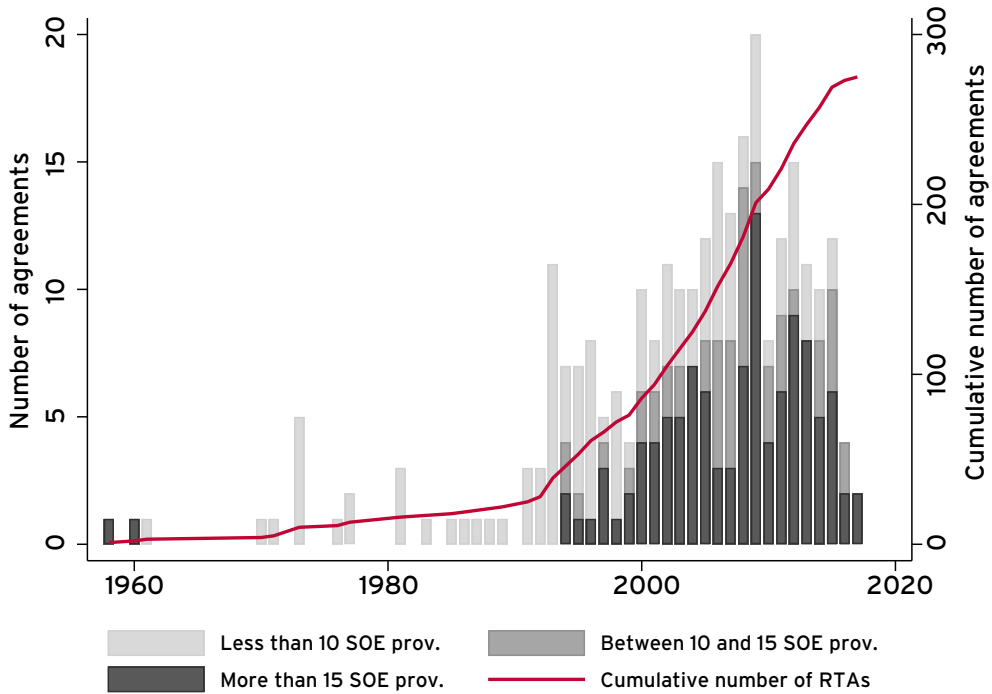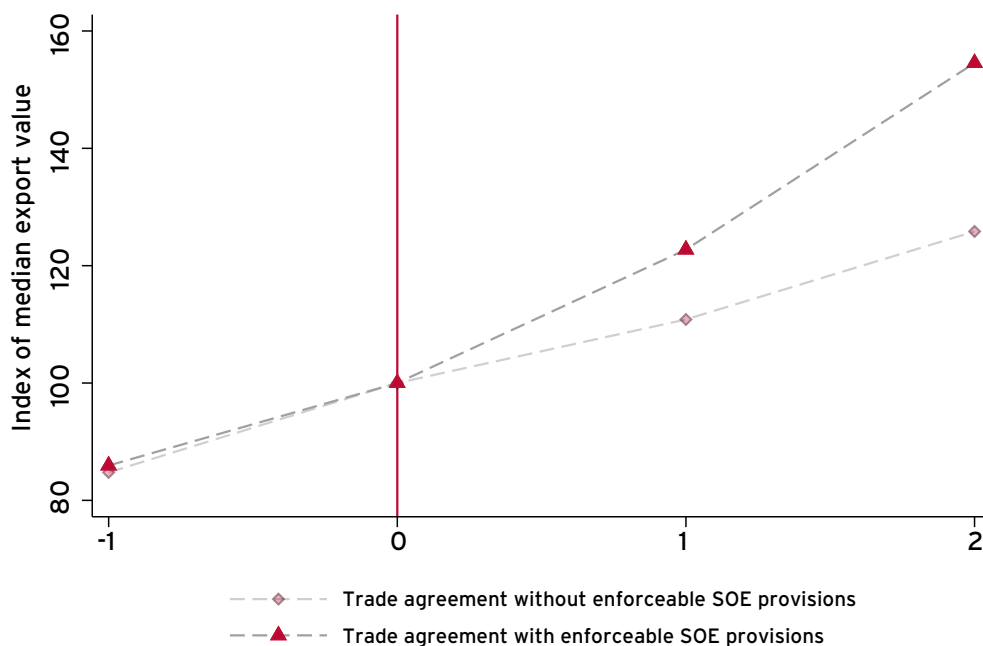

Source: Lefebvre et al. (2021).

SPILLOVER EFFECT OF SOE RULES

While third-country effects of preferential tariffs are well understood, the impact of other disciplines in trade agreements on non-members are less obvious (Mattoo et al. 2017). Third-country PTAs may affect both the extensive and the intensive margin of Chinese SOEs' exports. Provisions regulating SOEs decrease government support to SOEs in member countries, making them less competitive. In a heterogeneous firms framework à la Melitz (2003), the productivity threshold to export faced by Chinese firms decreases, stimulating less productive firms to enter these markets. As the productivity of Chinese SOEs is on average 40% lower than the private sector (Dewenter and Malatesta 2001, Hsieh and Klenow 2009), entry of new firms in member markets could benefit relatively more SOEs than private firms in China (extensive margin) as these firms are more likely to lie just below the export threshold. SOE provisions in third-country PTAs can also impact the intensive margin of Chinese SOEs' exports. To the extent that SOEs in different countries tend to compete in similar sectors, the regulation of SOEs in members' markets would give a competitive edge to Chinese SOEs, thus stimulating their exports.

Figure 12.2 takes a preliminary look at the potential spillover effect of SOE rules on Chinese exports. The figure plots the median of the index of Chinese exports (base 100 the year of entry of the PTA) to all the members of PTAs (excluding agreements with China) one year before and two years after the entry into force of the agreement, over the

period 1995–2015. The two lines differentiate between trade agreements including and excluding enforceable rules regulating SOEs. After the entry into force of the agreement, Chinese exports increased more to countries that signed agreements with enforceable SOE provisions relative to those with PTAs that did not regulate SOEs. This differential effect is prima facie evidence of a spillover effect of SOE rules in third-country PTAs.

FIGURE 12.2   TIME TREND OF CHINESE EXPORTS TO PTA MEMBERS
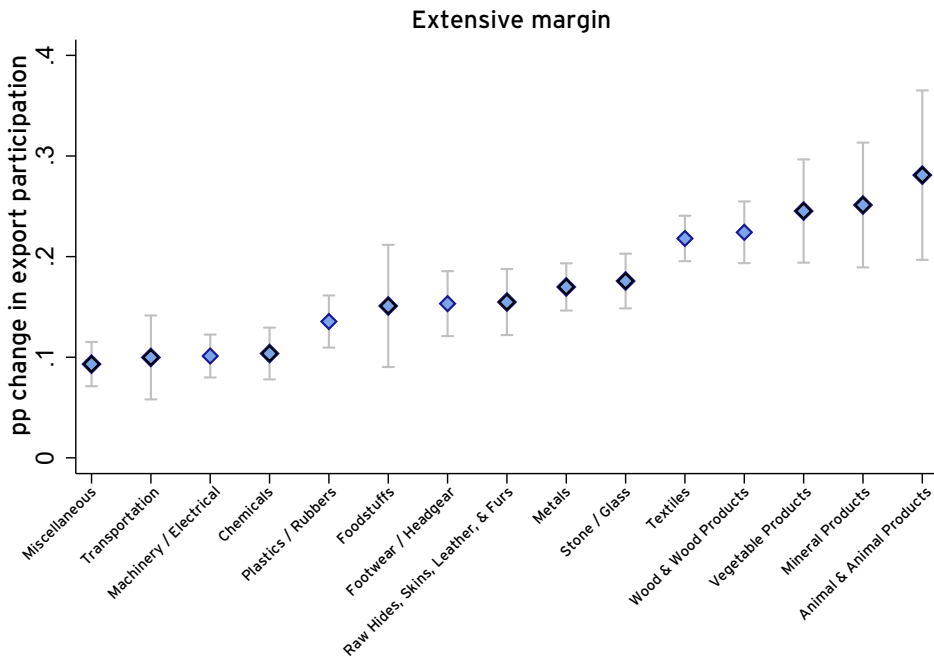

Source: Lefebvre et al. (2021).

MAIN RESULTS

We test more formally for the presence of a spillover effect of SOE rules in trade agreements using a structural gravity model. Specifically, our empirical strategy aims to assess the spillover effect of PTAs signed by destination markets through the rules regulating SOEs, while controlling for the direct impact of trade agreements and other confounding factors. As a first step, we analyse the impact of third-country PTAs on aggregate exports from China to investigate whether Chinese exports respond differently from other exporters to the inclusion of SOE provisions in third-country PTAs. We then focus on Chinese firm-level data from 2000 to 2011 and investigate the extent to which these effects are driven by changes in participation and exports of Chinese SOEs compared to their private counterparts.

We find that stricter SOE regulation between PTA members increases Chinese exports to these markets, as compared to exports from the rest of the world. This impact is particularly strong when the trade agreement contains enforceable provisions regulating

the ownership regime, subsidies, and the anticompetitive behaviour of SOEs. As an illustration, we find that stringent rules on SOEs in the EU-Colombia/Peru agreement are associated with an increase in exports from China by 1% as compared to the rest of the world, while no such effect is found for the EU-Korea agreement, which does not regulate SOEs. Turning to our firm-level empirical strategy, we further find that the surge in Chinese exports is driven by an increase in the participation and exports of Chinese SOEs as compared to private firms. Including the most stringent SOE regulations in a trade agreement signed between third countries increases Chinese SOE participation in those markets by 2.4% and their export value by 4.5% relative to private firms.

The paper then investigates a number of additional issues. First, we study how this spillover effect of SOE provisions varies when the agreement regulates other aspects of state intervention. We find that these effects are even stronger when we consider other provisions in PTAs, such as subsidies and competition policy, which complement SOE rules. Second, we analyse what sectors drive the spillover effect (Figure 12.3). While the rise in Chinese SOEs' participation is evenly distributed across sectors, we find that at the intensive margin, textile and electronics and machinery sectors drive the increase in exports. Finally, we decompose the contribution of the extensive and intensive margins to total changes in exports. We find that the increase in Chinese exports due to SOE regulations in PTAs is mainly driven by an increase in SOE entry in members' markets.

FIGURE 12.3   FIRM-LEVEL IMPACT OF ENFORCEABLE SOE PROVISIONS IN PTAS

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Intensive margin
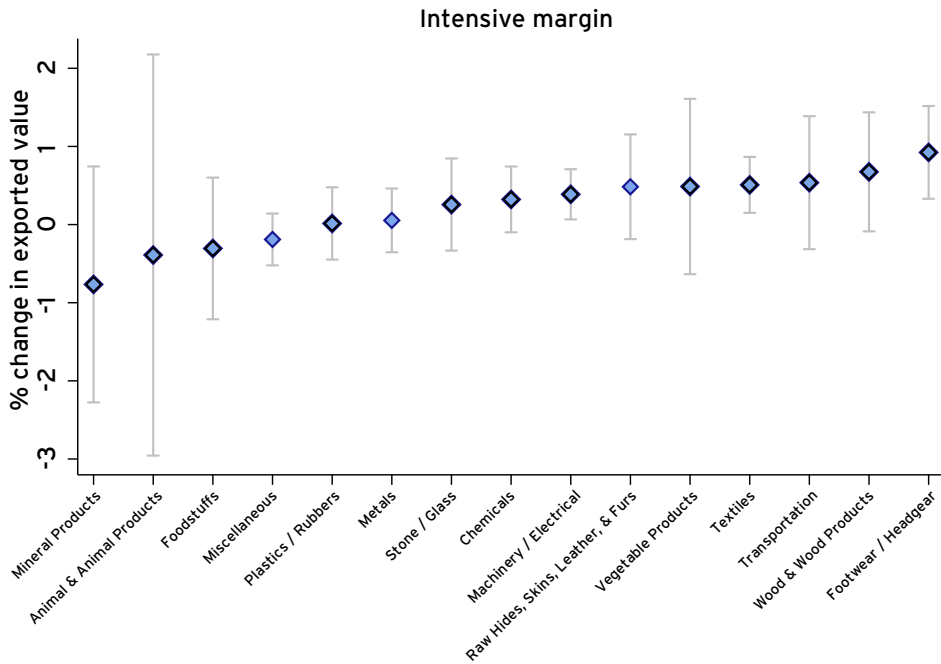
Source: Lefebvre et al. (2021).

CONCLUSIONS

These findings have relevant policy implications. Rather than containing Chinese SOEs, rules on SOEs in PTAs signed by Chinese trading partners with third countries boost Chinese exports relative to the rest of the world and benefit Chinese SOEs relative to private firms. If the goal of rules regulating SOEs in trade agreements is to promote reforms in non-member countries, they risk achieving the opposite outcome; their spillover effect strengthens the export performance of SOEs by making it easier for them to penetrate members' markets. Another consequence is that it may lead members of a PTA that enforces SOE provisions to step up the use of trade remedies, such as antidumping and countervailing duties, to target non-members' SOEs. Finally, from a normative perspective, the presence of this spillover effect points to the need for commonly agreed multilateral rules to regulate SOEs.

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NON-TRADE ISSUES IN TRADE AGREEMENTS

CHAPTER 13

How preferential trade agreements with strong intellectual property provisions affect trade

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The proliferation of preferential trade agreements (PTAs) across the globe in recent decades is well-known. Of particular interest is that such agreements have become increasingly 'deep': they cover a great many regulatory and seemingly non-trade issues, such as investment, labour mobility, and environmental practices. This trend has placed a central emphasis on elevated standards for defining and protecting intellectual property rights (IPRs). The WTO 1995 Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) established a common baseline of protection across the world. Since then, PTAs have become the preferred channel for countries seeking to negotiate even stronger standards with trading partners.

This insistence on so-called TRIPS-Plus standards in PTAs is now central to the trade objectives of advanced countries with significant export interests in goods needing IPR protection. For example, the US has concluded – with Australia, Jordan, Peru, South Korea, and other countries – agreements that embody significantly higher standards of patent protection for pharmaceuticals, stronger regulations governing copyrights in digital goods, greater expectations of enforcement, and expanded penalties for IPR infringements. The EU pursues similar goals, with added emphasis on protecting geographical indications. Thus, many recent PTAs increasingly provide far-reaching and prescriptive requirements that were not considered by the TRIPS framers. In our research, we label such accords 'Intellectual-Property-Related Preferential Trade Agreements', or IPAs.

Based on the World Bank Global Preferential Trade Agreements Database, the marked expansion in the number of legally enforceable IPAs since 1990 and the number of countries joining them are depicted in Figure 13.1. As shown in panel (a), the number of IPAs rose from less than 20 in 2000 to 100 in 2015, while the number of countries involved now exceeds 100. Thus, currently around 64% of WTO contracting parties are members of at least one IPA, as defined here. Panel (b) shows the more modest growth in IPAs involving the US as a partner. The 2005 Dominican Republic-Central America (CAFTA-DR) agreement markedly raised the number of countries, currently around 20, in such agreements. Panel (c) demonstrates the faster growth in agreements where the EU or the

European Free Trade Area (EFTA) is a partner. There were discrete jumps in country coverage in 1994 with the foundation of the European Economic Area and in 2008 with the establishment of the EU–Caribbean Forum (CARIFORUM) agreement. Together, the EU and EFTA are party to more than 40 enforceable IPAs. Because of the high degree of IPR harmonisation within them, the EU and EFTA themselves are counted as IPAs in our sample. Finally, panel (d) indicates that there are some 40 IPAs, involving around 60 countries, that do not involve the US, the EU, or EFTA.

FIGURE 13.1   THE NUMBER OF LEGALLY ENFORCEABLE IP-RELATED TRADE AGREEMENTS AND NUMBER OF COUNTRIES WITH MEMBERSHIP IN AT LEAST ONE SUCH AGREEMENT BY YEAR, 1990-2015
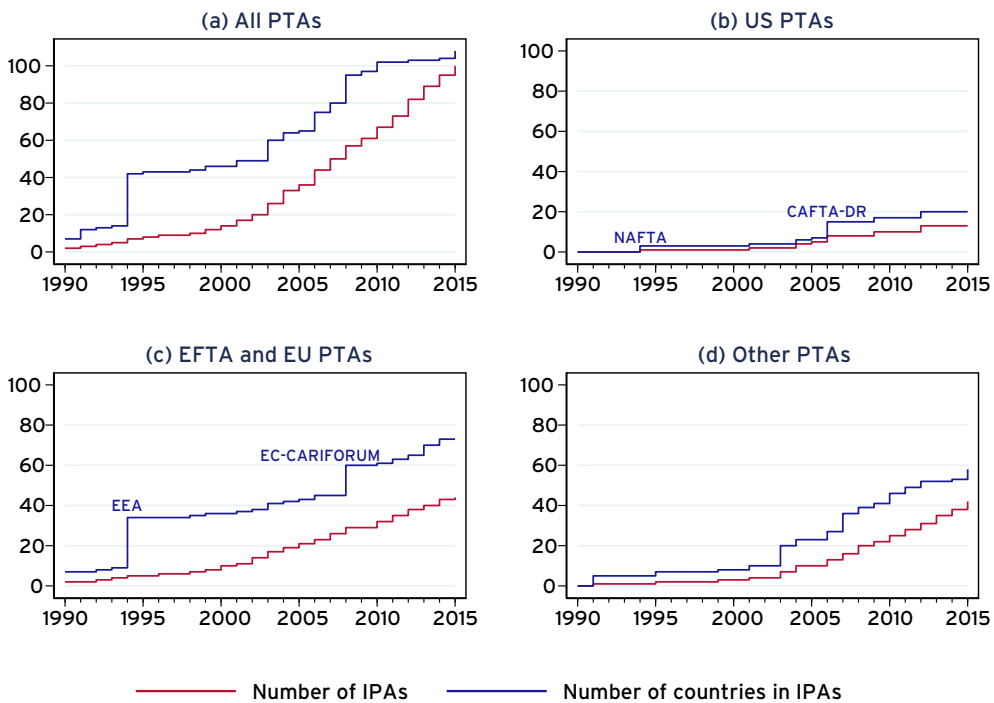
The World Bank database identifies 130 detailed IPR provisions, covering 16 broad categories. In our review of that data, we characterise 32 of these as 'Beyond TRIPS' (BTRIPS) to capture the many elements of TRIPS-Plus requirements in modern IPAs. These range across patents, test-data protection, trademarks, geographical indications, copyrights, and enforcement. The US is the top demandeur of these BTRIPS conditions. The EU/EFTA IPAs are considerably less prescriptive, though more focused on geographical indications and enforcement. The elevated standards in geographical indications, patents, data protection, and copyrights are virtually absent in IPAs involving countries other than the US and EU/EFTA.

ESTIMATION OF TRADE IMPACTS

What are the effects of joining IPAs on a country's international trade? This is a challenging question to answer because it is difficult to isolate the effects of IPR provisions from both the broader trade implications of any PTA and other confounding factors. Our approach to identifying the specific effects of IPR protection is to work within a treatment-control econometric framework. We define policy-treated countries as those within various kinds of legally enforceable IPAs. We distinguish between clusters of sectors that are highly intensive in intellectual property (IP), such as biopharmaceuticals and medical devices, and those with lower sensitivity, arguing that trade effects should be more detectable in the former. We also permit heterogeneity of effects across various World Bank income groups, ranging from low-income to high-income. We include countries that join IPAs only after they have implemented the TRIPS requirements to isolate the effects of the former. Finally, to fully alleviate concerns about endogeneity, we estimate the effects on treated countries' trade with third countries, rather than with partner nations within IPAs. We estimate such effects for both aggregate and bilateral third-party trade in groups of high-IP goods.

In this summary, we share key results from three definitions of treatment IPAs. The first involves IPAs in which the US, EU, or EFTA is a partner, capturing agreements with the major demandeur countries. In the second, we consider all agreements in which IPRs are designated as legally enforceable and, in the third, we use those IPAs where the US, EU or EFTA are not partners.[1]

Beginning with aggregate sectoral trade flows, we find first that exports of low-IP products by partner countries to third markets are markedly reduced by membership in legally enforceable IPAs. This outcome is sharp in those involving the US, EU or EFTA but does not exist in IPAs where none of those three is a party. In contrast, countries in IPAs involving the US, EU, or EFTA experience significant increases in third-country exports of biopharmaceuticals at all levels of income and medical instruments among high-income economies. Again, those IPAs without the demandeurs seem to exert few significant effects on trade in either low-IP or high-IP categories. One interpretation of this finding is that there may be a sorting effect of membership in such agreements, reducing relative exports of low-IP goods and raising them in specific IP-sensitive sectors. This conclusion is tentative, however, because the negative coefficients on low-IP exports largely disappear in the regressions involving detailed bilateral trade. However, the positive effects in biopharmaceuticals and medical devices are reinforced, in the latter case, especially for higher-income countries. All this suggests that strongly prescriptive IPAs have their strongest effects on exports of products that were a primary target for IPR protection.

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1   In the working paper, we also report results for IPAs selected for subsets of BTRIPS provisions but, to conserve space, we do not discuss them here.

A second outcome is that, while imports into lower-income economies of certain high-IP products are stimulated by the first two categories of IPAs, they are otherwise insensitive to such agreements. This is true for both aggregated and bilateral trade in high-IP clusters. PTAs with elevated protection standards for intellectual property rights seem to be more impactful in terms of export behaviour.

EXPLORATORY ANALYSIS OF MECHANISMS

Such findings raise the question of what mechanisms may drive the trade expansion. One potentially important channel is the responses of global firms to what they may perceive as improved investment climates associated with IPAs. It may be, for example, that increased third-country exports of high-IP products reflect increases in domestic production capacity, which may be the result of higher inward technology flows. In the absence of data regarding firm-level responses of both affiliates and domestic firms, this is a difficult question to answer. We explore this issue on a preliminary basis by bringing in additional data from the US Bureau of Economic Analysis that may capture the role of foreign direct investments, via affiliate activities in IPA-member countries. We also employ data on US related-party trade to consider the effects of IPAs on trade in intermediate inputs.

We first study the effects of IPAs on the sales of local affiliates of US majority-owned affiliates in broad manufacturing sectors that most closely track our high-IP products. The closest aggregate sectors in the US Bureau of Economic Analysis data are chemicals, computers and electronic products, and electrical equipment, appliances, and components. Affiliate sales were used as the dependent variable in similar regressions, with these sectors constituting a set of high-IP-sensitive goods. We also permit the effects of joining IPAs on sales to be both contemporaneous and to occur with a one-period lag. In this framework, we find that IPAs have insignificant effects on broadly defined affiliate sales of low-IP goods. However, the effects on high-IP sales are positive and significant, while spread over the current year and a one-year lag. Unsurprisingly, this outcome is strongest in IPAs involving the US but persists in those involving the EU or EFTA and in the group of all enforceable agreements.

In sum, there is evidence that IPAs with elevated IPR expectations are correlated with rapid expansion of sales by US-owned affiliates. Because those sales include exports to third countries, domestic capacity growth may underlie our earlier trade results to some degree. However, this finding needs to be treated with caution, given the broadly aggregated nature of the Bureau of Economic Analysis affiliate-sales data.

Finally, we analyse the impacts of these IPAs on US related-party exports to partner countries. Such exports largely capture intermediate inputs sent to US-owned affiliates for local assembly or production of final goods. These data exist for relatively detailed North American Industry Classification System industries, which correspond closely to our high-IP sectors used in the trade analysis. Our regression findings suggest

heterogeneity across agreement types. Specifically, US-partnered agreements see notable increases in related-party exports of pharmaceuticals and medical devices. In this context, perhaps the increases in exports to third countries discussed above are associated with greater flows of technological inputs in those sectors. In contrast, related-party trade in these industries is unresponsive to the other forms of IPAs. In those cases, the third-country trade effects seem more associated with locally generated capacity expansion in US affiliates. One notable finding is that related-party exports in information and communications technology are reduced in all three agreement types. This suggests that affiliate production in electronics goods becomes less reliant on imported inputs after joining such an agreement.

CONCLUDING REMARK

Our results suggest that countries joining a PTA with rigorous IPRs standards are likely to see a readjustment of their trade patterns. Exports of pharmaceutical goods and medical devices seem to respond positively, while there may be some diminution in low-IP exports. To some degree, such outcomes may reflect the responses of multinational firms and their affiliates. However, the findings are only indicative at this point and require further analysis and refinement.

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CHAPTER 14

Deep integration in trade agreements: Labour clauses, tariffs, and trade flows

Raymond Robertson

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The proliferation and 'deepening' of preferential trade agreements (PTAs) since the 1990s include incorporating social protections into trade agreements. Debate in the 1990s and early 2000s focused on the intent of social clauses and whether social clauses are appropriate for trade agreements. Since the mid-2010s, the debate has shifted towards understanding the impact of social clauses on trade. It is well established that PTAs increase trade overall (Baier and Bergstrand 2007, Baier et al. 2014), but whether this increase might be mitigated by 'deep' clauses is unclear (Rodrik 2018).

Labour clauses are an excellent case in point. The rise of labour clauses raises three key questions that are summarised in Figure 14.1. Labour clauses in trade agreements may help improve working conditions (Brown et al. 1996, Rodrik 1996, Polaski 2004, ILO 2016, Kamata 2016, Dewan and Ronconi 2018, Martinez-Zarsoso and Kruse 2019) by creating incentives to expand domestic enforcement or, in the case of Cambodia, explicitly linking market access to improvements in exporting factories (Beresford 2009, Robertson et al. 2020, Robertson 2021).

Whether improvements in working conditions have been associated with more total trade is still a matter of debate. Evidence from buyers at the factory level suggests that buyers may or may not reward compliant factories with either higher prices or larger orders (Oka 2012, Distelhorst and Locke 2018), but these studies do not focus on total country-to-country trade. As labour clauses become increasingly common, estimating the relationship between labour clauses and trade flows is becoming more important.

FIGURE 14.1   TRADE, LABOUR CLAUSES, AND WORKING CONDITIONS
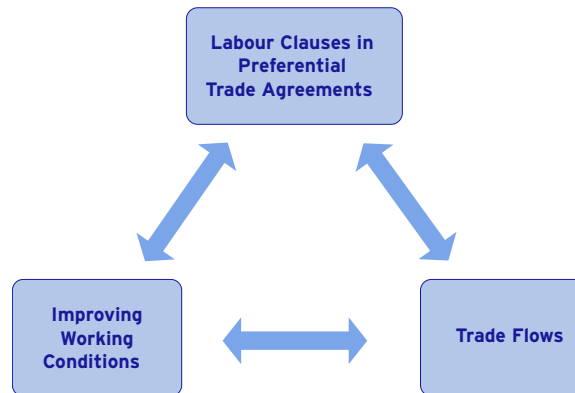
Estimating whether these clauses increase or decrease total trade between country pairs is complicated by the fact that labour clauses vary significantly both within and across agreements. Clauses may be associated with more or less trade, depending on how they affect trade costs, production costs, and working conditions. Holding all else constant, clauses that reduce or eliminate trade in goods produced with forced labour, child labour, or underpaid labour would necessarily be associated with less trade. For example, Section 307 of the US Tariff Act of 1930 (amended in 2015 to remove the domestic consumption exception) bans imports produced with forced or child labour. If there were imports produced with such labour before the law went into effect, and if the law were effective, then trade after this law goes into effect should be lower, holding all else constant, because the illicit trade is removed from total trade flows. In other words, at least part of the success of Section 307 would be based on the amount that trade fell by, holding all other factors constant.[1] To the extent that labour clauses either impose conditionality on trade flows or increase costs (for example, by requiring that workers in producing factories are paid accurately and according to national law), they should be associated with lower marginal trade flows.

Since falling trade costs lead to more trade, clauses that contribute to lower trade costs by harmonising standards or by promoting good practices institutions (including freedom of association and collective bargaining) would be associated with more trade. Kucera (2002) finds freedom of association and collective bargaining rights have a strong, positive relationship with investment flows, based on the idea that protecting these rights indicates strong domestic institutions. If higher investment is correlated with trade, then trade should also increase. In fact, Kucera and Sarna (2006) find that protecting freedom of association and collective bargaining rights has a strong positive relationship with trade flows. Furthermore, labour clauses may reduce reputation risk, and therefore increase trade (Polaski 2004).

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1   The *Economist* offers several specific examples of how recent trade regulations seek to reduce or eliminate trade produced with forced labour. See "How trade is being used to enforce labour standards", *Economist*, 10 October 2020, https://www.economist.com/finance-and-economics/2020/10/10/how-trade-is-being-used-to-enforce-labour-standards.

Although several papers estimate the relationship between trade and labour clauses, few, if any, empirically distinguish between clauses that theory suggests would have very different relationships with trade flows. Most papers apply a binary variable measuring the presence of labour clauses, regardless of the content of the clauses. Using such an indicator, Kamata (2014) finds no statistically significant differences in trade between agreements with or without labour clauses. Using the Labor Provisions in Trade Agreements dataset created by Raess and Sari (2018), Carrere et al. (2017) extend this work by differentiating labour clauses with and without enforcement, and labour clauses designed to foster deep cooperation. Using a sample covering the 1995–2004 period, restricted to countries with positive trade flows, and by differentiating trade flows from low-income to high-income countries, they find that enforcement has no effect on trade flows, but clauses with 'deep' cooperation are associated with more trade.

Extending the analysis to include a law-based classification of labour clauses, including different forms of enforcement, LeClercq et al. (2020) find that labour provisions, defined as a combination of clauses that define standards and those that establish enforcement, are associated with lower trade flows, but they are accompanied by clauses that promote trade, so that the overall effect of labour clauses on trade is positive.

New research combines advances in gravity-model estimation techniques with the detailed coding in the new Handbook of Deep Trade Agreements (Mattoo et al. 2020) to generate estimates of the relationship between very detailed labour clauses and bilateral trade flows. In a recent paper (Robertson 2021), I combine the Handbook's 17 labour clauses with bilateral trade data covering 1995–2018. With over one million observations, the analysis includes controls for constant country-pair factors and time-varying importer and exporter factors. The main results are summarised in Figure 14.2, in which the circles represent point estimates and the bars indicate 95% confidence intervals.

Keeping in mind that trade agreements with and without labour clauses increase trade and that the estimated results should be interpreted as being 'on the margin', Figure 14.2 shows that some labour clauses are positively and others negatively associated with trade flows. Clauses linked to freedom of association and collective bargaining, forced labour, and child labour and international labour standards are strongly associated with larger trade flows. The clauses shown in the middle of Figure 14.2 generally do not have statistically significant effects over the full sample of total trade. The clauses that seem to be associated with less trade, on the margin, are those that:

- Specify prohibitions on discrimination;

- Reference ILO/UN instruments (ILO 2008 Declaration on Social Justice for a Fair Globalization; the ILO's Decent Work agenda; and the UN ECOSOC 2006 Ministerial Declaration on Generating Full and Productive Employment and Decent Work for All);

- Reference the protection/promotion of working conditions and terms of employment.

FIGURE 14.2   ESTIMATED RELATIONSHIP BETWEEN LABOUR CLAUSES AND TRADE VOLUME
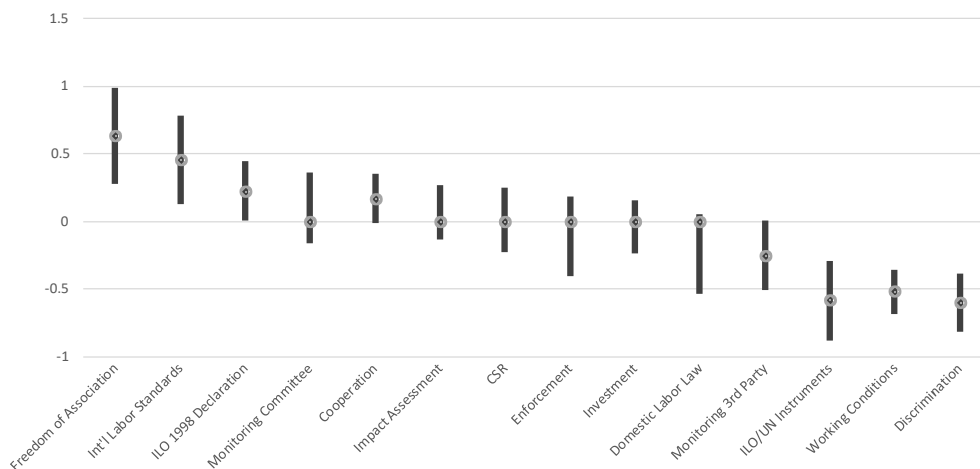
Source: Robertson (2021).

If these clauses are associated with improved working conditions for workers, such as being paid according to national law, then it is possible that changing these practices reduces exports that had an unfair cost advantage.

Additional results suggest that setting up a private committee for monitoring is associated with more trade, but third-party monitoring is associated with less trade. Some third-party monitoring (such as the Better Work Programme described earlier) has been shown to significantly improve compliance with domestic labour law and international labour standards (Beresford 2009, Robertson 2020, Robertson et al. 2021). The role of both private committees and third-party monitoring deserves additional study.[2]

The results in Figure 14.2 are robust not only when limited to manufacturing trade and trade excluding the US as an importer, but also change little when tariff margins and other clauses are factored in. Using the Handbook's rich classification of hundreds of clauses, this study extends the current literature by adding in tariff preference margins (that consistently are shown to increase trade) and other 'deep' clauses that Breinlich et al. (2021) identify as being most likely to affect trade flows.

Different results do emerge, however, when trade is limited to lower-income exporters. In this case, enforcement and clauses that are related to non-derogation of domestic labour law are associated with less trade. This finding also supports the existing body of work that shows that labour clauses in trade agreements are associated with improvements in working conditions.

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2   Kuruvilla et al. (2020) show that private monitoring generally fails to improve working conditions.

The negative association between trade volume and both third-party monitoring and non-derogation of labour laws for lower-income exporters seems curious to those who know that no successful cases have been brought – under the trade agreement framework – to enforce violations of domestic labour law (see Cimino-Isaacs 2020 for a brief description of US cases brought within free trade agreements). Possible explanations may lie in technical support provided as part of the agreement for domestic inspections (Dewan and Ronconi 2018) or effective deterrence/incentives to enforce domestic laws. Since the results in this paper cannot distinguish between these, the estimated negative result suggests an area for continued research.[3]

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3   Aissi et al. (2018) explain how to evaluate this hypothesis and Kamata (2016) and Martinez-Zarzoso and Kruse (2019) are examples of the debate whether trade agreements improve working conditions.

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CHAPTER 15

Trade agreements with environmental provisions mitigate deforestation

Ryan Abman,[a] Clark Lundberg,[a,b] and Michele Ruta[c]
[a]San Diego State University; [b]US Department of Agriculture; [c]World Bank

Since the early 1990s, we have seen an unprecedented push for trade liberalisation, with 262 preferential trade agreements (PTAs) involving 188 countries entering into force. While the reduction in trade barriers offers tremendous potential for economic growth and productivity gains, concerns over potential adverse environmental effects have stimulated a debate on whether trade agreements should include specific provisions targeting the environment. While some see such provisions in PTAs as a form of thinly veiled protectionism, others perceive them as an important tool for mitigating potential harm from opening trade and a commitment device for environmental policy reform (Frankel 2009). Despite negotiations and policy discussions around the inclusion of environmental provisions in PTAs, there has been little in the way of rigorous work exploring whether these provisions actually function as designed.

In a recent study (Abman et al. 2021), we provide new causal evidence that environmental provisions are effective in limiting deforestation following the entry into force of PTAs. We exploit high-resolution, satellite-derived estimates of deforestation and identify the content of environmental provisions in PTAs, using a new World Bank Deep Trade Agreements database (Mattoo et al. 2020). Accounting for the potential endogeneity of environmental provisions in PTAs, we find that the inclusion of specific provisions aimed at protecting forests and/or biodiversity entirely offsets the net increases in forest loss observed in similar PTAs without such provisions. This effect primarily works by limiting agricultural land expansion in ecologically sensitive regions.

DATA ON FOREST LOSS AND ENVIRONMENTAL PROVISIONS IN TRADE AGREEMENTS

Deforestation is one of the most pressing environmental challenges of the modern era, both in its threat to biodiversity through destruction of sensitive habitat as well as its prominent role in global climate change through associated greenhouse gas emissions. The extent of forest loss in the past 30 years has been unprecedented: on net, the world lost approximately 178 million hectares of forest area between 1990 and 2020 (FAO 2020). In our study, we use high-resolution, satellite-derived estimates of deforestation as a measure of environmental damage. In addition to being an important environmental

outcome in its own right, satellite-derived deforestation measures are also spatially explicit local measures of environmental harm that circumvent many limitations associated with administrative data on environmental damage. The data are from the Global Forest Change dataset by Hansen et al. (2013) and provide high-resolution estimates of year 2000 forest cover and annual estimates of forest loss for the entire terrestrial surface of the earth. Following Abman and Lundberg (2020) (among others), we aggregate these spatially explicit estimates of forest loss to the country level to create a panel dataset of estimated annual forest loss for 193 countries from 2001 until 2014.

FIGURE 15.1   TRADE AGREEMENTS AND ENVIRONMENTAL PROVISIONS OVER TIME
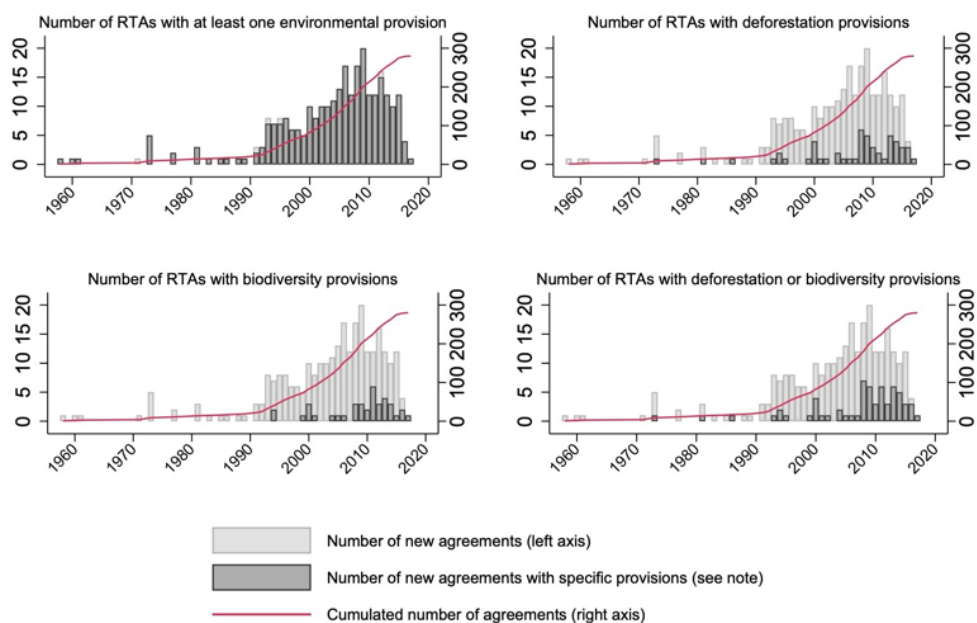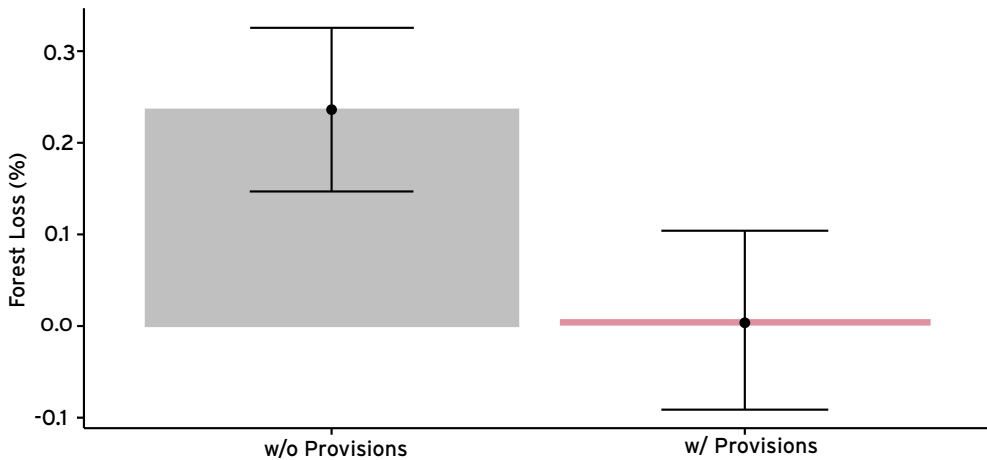

Source: Abman et al. (2021).

We combine the information on forest loss with detailed data on environmental provisions in PTAs (Monteiro and Trachtman 2020). These data cover all PTAs notified to the WTO and in force up to 2018. Figure 15.1 provides a summary view of the evolution of the environmental content in PTAs, and specifically the inclusion of specific provisions aimed at the protection of forests and biodiversity. Panel (a) shows that the inclusion of environmental provisions in PTAs is not a recent nor an uncommon phenomenon – close to 90% of trade agreements currently in force have some rules concerning the environment. Panels (b) to (d) show, however, that focusing on overall environmental provisions can be deceiving. Prior to the 1990s, environmental provisions in PTAs did not establish any obligation of environmental protection. Rather, these provisions took the form of environmental exception clauses to trade policy commitments, such as those to protect the conservation of natural resources. This progressively changed in the 1990s

and – with much stronger emphasis – in the late 2000s when PTAs increasingly included commitments to environmental protection. Panels (b) to (d) document this shift for deforestation and biodiversity provisions.
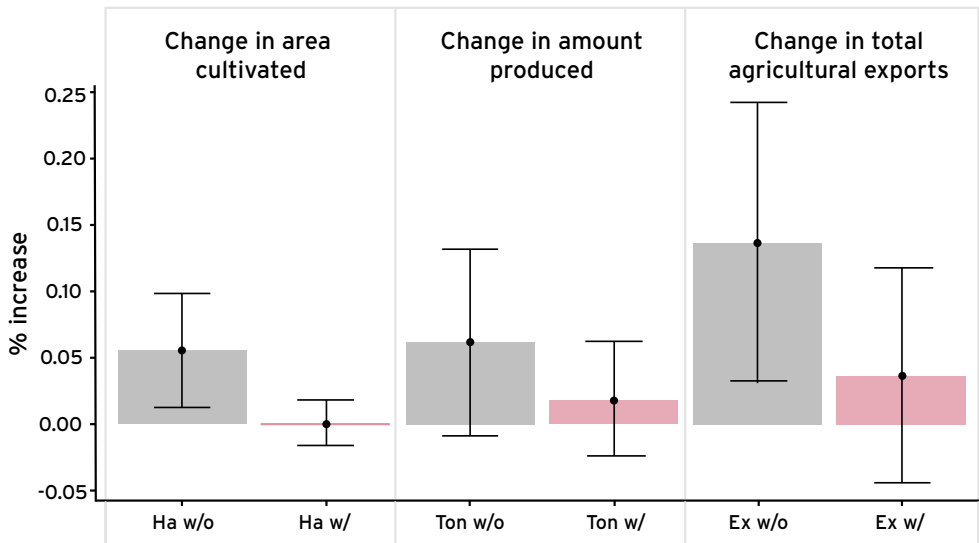
ENVIRONMENTAL PROVISIONS MITIGATE DEFORESTATION

In our study, we test whether the inclusion of provisions in PTAs aimed at protecting forests and/or preserving biodiversity mitigate the ecological impacts of trade liberalisation. A key econometric challenge is that the inclusion of environmental provisions in PTAs is non-random. Specifically, when member countries have greater forestry coverage and biodiversity, trade agreements may be more likely to include environmental provisions. To account for this endogeneity problem, we proceed in three steps. First, from the set of PTAs that enter into force from 2004 and 2014, we estimate the predicted probability that a PTA includes a forest and/or biodiversity provision via the use of machine-learning techniques and a variety of PTA and group-level characteristics. Second, we use these predicted probabilities to match PTAs that include forest and/or biodiversity provisions to similar PTAs without them to create an appropriate set of counterfactuals. Finally, we construct a panel dataset on total forest loss for all countries that join a given PTA and, using a triple-difference model, test whether aggregate increases in forest loss associated with PTA enactment are lower for PTAs with environmental provisions than those without.

Using this three-step approach, we find large and significant net increases in annual forest loss following PTAs without environmental provisions (23%). Furthermore, we find that the inclusion of these provisions entirely offsets the rise in forest loss observed in the counterfactual PTA groups after enactment (Figure 15.2). We then perform a second exercise to identify the areas and ecosystems that are driving the results. Our panel dataset of agreement-level deforestation was reconstructed using only a subset of country-level forest loss across agreement signatories, considering tropical forest loss, forest loss in developing countries, and forest loss in countries with high biodiversity. We find that the mitigating effect of environmental provisions on deforestation is largely driven by changes to forest loss in tropical developing countries with high levels of biodiversity – the locations where deforestation is of greatest concern.

FIGURE 15.2   CHANGE IN AVERAGE ANNUAL FOREST LOSS AFTER PTA ENACTMENT

Source: Abman et al. (2021).

FIGURE 15.3   CHANGES IN AGRICULTURAL LAND USE, PRODUCTION AND EXPORTS

Source: Abman et al. (2021).

We then investigate the mechanisms through which forestry and biodiversity provisions in PTAs mitigate environmental damage. Analysis using the same matched triple-difference approach indicates that environmental provisions limit agricultural land expansion that otherwise occurs following the entry into force of trade agreements. PTAs without these environmental provisions lead to a 5% increase in the annual land area

harvested on average while there is no increase in agricultural extensification following PTAs that include these provisions (Figure 15.3, left panel). Trade liberalisation also leads to increases in agricultural output (as measured in tonnes harvested) that is partially, but not completely, offset by the inclusion of these provisions (Figure 15.3, central panel). This suggests that environmental provisions may limit agricultural land expansion, but not intensification. Net increases in agricultural exports are also lower in PTAs with environmental provisions, but not entirely offset.

CONCLUSION

In our research, we evaluate the effectiveness of forest-related PTA provisions at limiting deforestation arising from trade liberalisation. We find no changes in net annual deforestation following implementation of agreements that include provisions aimed at protecting forest and/or biodiversity, while agreements without these provisions see substantial increases in net forest loss, i.e. provisions reduce forest loss relative to PTAs that do not include them. Back-of-the-envelope calculations from our triple-difference estimates indicate that the forest and biodiversity provisions prevented approximately 7,500 square kilometres of deforestation from 2003–2014 – this is greater than the entire forested area of a country like Belgium or Ireland.

While the data we have do not allow us to observe the implementation of PTA rules, the econometric findings suggest that these types of environmental provisions provide a mechanism to defray the environmental costs that can arise from international trade integration. While we concede that the inclusion of such provisions may incur some bargaining costs in the negotiation phase of trade agreements, they appear to provide an institutional framework that allows member countries to commit to policies that encourage more sustainable patterns of trade integration and economic growth.

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CONCLUSION

CHAPTER 16

Why deep trade agreements may shape post-COVID-19 trade

Aaditya Mattoo, Nadia Rocha, and Michele Ruta
World Bank

The COVID-19 pandemic will reshape global trade. Production disruptions created by the global pandemic could lead to a reconfiguration of global value chains and trade patterns as firms reassess their business strategies (Freund et al. 2021, Javorcik 2020, Lund et al. 2020). Recent trade policy changes are also likely to shape these decisions, with long-lasting effects on the structure of trade and on global economic efficiency (Baldwin and Evenett 2020). But how trade policies evolve will depend on the degrees of freedom governments have, and that will depend on the rules and commitments in their international trade agreements.

In this chapter, we investigate the role of preferential trade agreements (PTAs) in shaping world trade in the post-COVID-19 world. PTAs, and particularly the deep commitments in trade agreements – i.e. deep trade agreements (DTAs) – have influenced world trade and global value chains in the past 30 years (World Bank 2020). These arrangements may matter even more in a post-COVID-19 world characterised by political pressure for trade policy activism. But DTAs may also allow more discrimination than in the past because partners in DTAs are shielded from some protectionist measures, while outsiders, often developing countries, are not. To illustrate our argument, we exploit the new World Bank Deep Trade Agreements database, which provides detailed information on the policy areas most frequently covered in the agreements notified to the WTO between 1958 and 2018 and currently in force (Mattoo et al. 2020).

COVID-19 may lead to old and new trade measures, many of a protectionist nature:

1. As non-synchronised recovery creates competition for scarce demand, governments may be tempted to use tariffs to redirect demand towards domestic production.

2. In situations of scarcity, export restrictions have already been employed to meet domestic demand.

3. As states increase the use of subsidies to help firms recover from the COVID-19 crisis, we are likely to observe a surge in countervailing duties.

4. Rising aversion to various risks, such as health, security, and privacy risks, may open the door to increased regulatory protectionism ('precautionism').

5. To deal with limited access to diagnostic tests, vaccines, and treatments, there can be attempts to overcome constraints posed by intellectual property rights (IPR) rules.

DTAs will matter as they contain rules in these five policy areas that bind members but will also have consequences for non-members.

TARIFFS

DTAs have reduced (trade-weighted) applied average tariffs rates to less than 5% for more than two-thirds of countries in the world. As Figure 16.1 shows, these rates are well below the WTO commitments for most countries. The gap between applied tariffs and WTO commitments (the so-called 'tariff water') is 5.6% on average, with peaks of over 25% for a handful of countries. In this context, if governments use legal tariffs to redirect demand towards domestic production, trade between DTA partners would be relatively protected as these measures would hit primarily non-members.

FIGURE 16.1   AVERAGE 'TARIFF WATER', PER COUNTRY
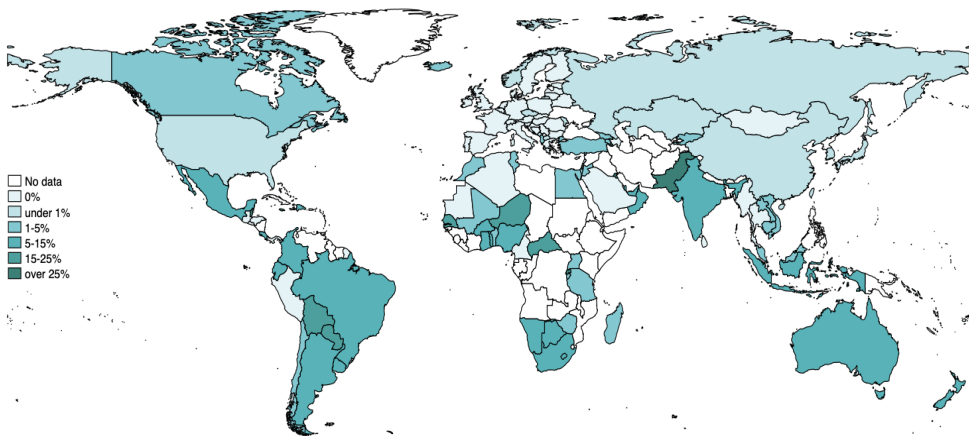
Notes: Water in the tariff is defined as the difference between bound and most favoured nation (MFN) rates for country pairs without agreement. It is equal to max (zero, preferential-MFN) for products that are under an agreement.

Source: Espitia et al. (2020).

EXPORT RESTRICTIONS

Around 80 countries are members in DTAs that prohibit or limit the use of export taxes and quotas. Figure 16.2 shows that these disciplines in DTAs insulate on average 31% of imports of parties from export restrictions. But they also leave other countries vulnerable to shortages of essential imports. If disciplines on export restrictions in DTAs were 'multilateralised', that is if they were applied non-discriminatorily to members and non-members, then on average 79% of global imports would be covered.

Figure 16.3 shows that, while all countries would benefit from improved certainty in their import sources, the primary beneficiaries of 'multilateralising regionalism' would be the least developed countries.
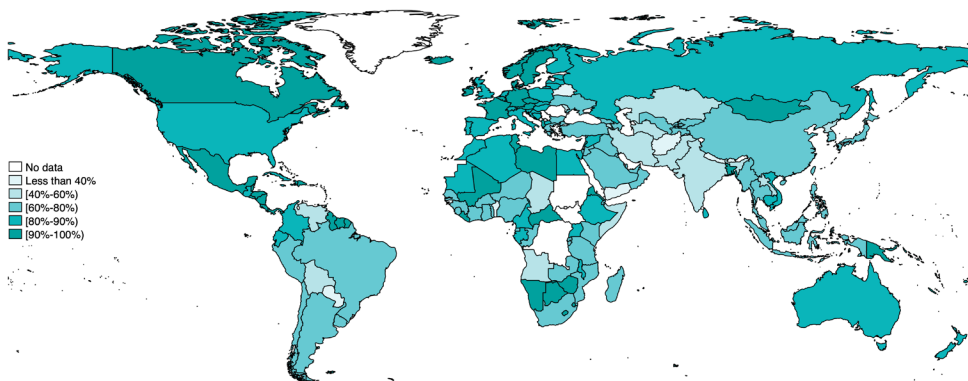
FIGURE 16.2   SHARE OF IMPORTS COVERED BY KEY EXPORT RESTRICTIONS PROVISIONS, BY COUNTRY
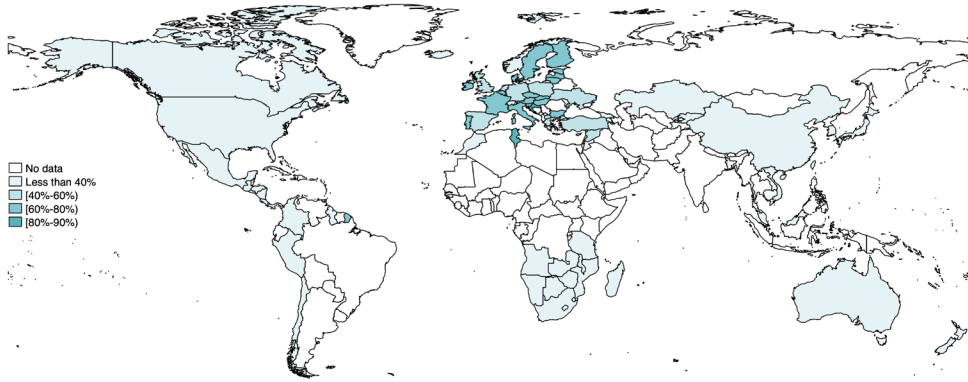
Notes: Share of imports from countries part of agreements, including all key export-restriction provisions over total imports, by country. Key provisions on export restrictions are: [The agreement] (i) prohibits all export quotas/quantitative restrictions between the parties, without reference to exceptions within the provision; (ii) prohibits all export quotas/quantitative restrictions between the parties, but with reference to certain exceptions mentioned in the provision that are WTO-plus; (iii) prohibits all export taxes between the parties, without reference to exceptions within the provision; and (iv) prohibits all export taxes between the parties, but with reference to certain exceptions mentioned in the provision that are WTO-plus.

Source: Wu (2020a).

FIGURE 16.3:   SHARE OF IMPORTS FROM COUNTRIES PART OF A DTA WITH KEY EXPORT RESTRICTIONS PROVISIONS

Notes: Share of imports from countries part of agreements including all key export restrictions provisions over total imports, by country. Key provisions on export restrictions are: [The agreement] (i) prohibits all export quotas/quantitative restrictions between the parties, without reference to exceptions within the provision; (ii) prohibits all export quotas/quantitative restrictions between the parties, but with reference to certain exceptions mentioned in the provision that are WTO-plus; (iii) prohibits all export taxes between the parties, without reference to exceptions within the provision; and (iv) prohibits all export taxes between the parties, but with reference to certain exceptions mentioned in the provision that are WTO-plus.

Source: Wu (2020a).

SUBSIDIES AND COUNTERVAILING DUTIES

As part of the policy response to the COVID-19 crisis, many countries are giving or planning to give subsidies to their private sector (stimulus packages are roughly 10% and 5% of GDP for developed and developing countries, respectively). These measures have a strong rationale during a crisis, but they will have trade consequences and least developed countries with weaker fire power will be disadvantaged. DTA rules on subsidies rarely constrain governments' largess. The reason is that subsidies are hard to discipline in a PTA because of a free-rider problem – any restriction on transfers to domestic producers benefits not just members of an agreement but also non-members; that makes it harder in the future for members to negotiate away distortionary subsidies granted by non-members. The EU state aid rules, which limit many forms of subsidies, are an exception motivated by the need to ensure undistorted conditions of competition within the economic union. Accordingly, subsidy rules cover a significant share of trade primarily in the EU, especially of the Eastern European countries whose trade is relatively more EU oriented (Figure 16.4).

**FIGURE 16.4   SHARE OF EXPORTS COVERED BY KEY SUBSIDY PROVISIONS**
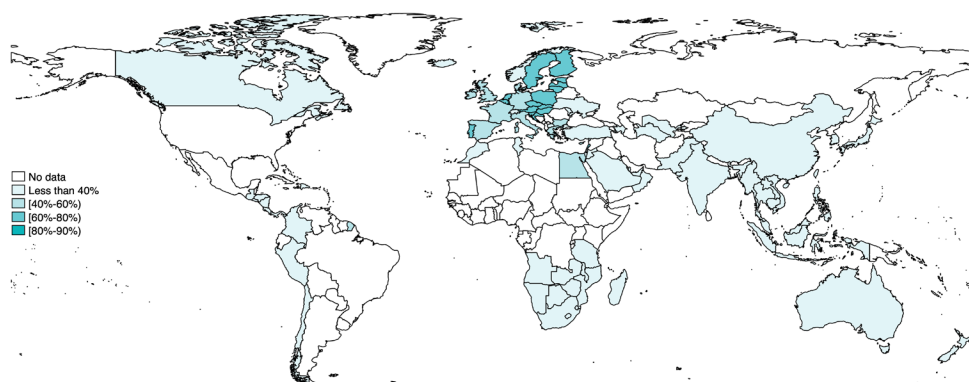
Notes: Share of exports covered by all key subsidy provisions legally enforceable over total exports, by country. Key subsidy provisions include: (i) the agreement prohibits or regulates export subsidies; (ii) the agreement prohibits or regulates local-content subsidies; and (iii) the agreement prohibits or regulates subsidies distorting trade or competition (within domestic, export, or third markets).

Source: Rubini (2020).

A consequence of the increase in subsidies is that the use of countervailing duties, which are anti-subsidy tariffs, will be on the rise. Countervailing duties, and possibly other forms of contingent protection, will be imposed to address true or perceived state support by trade partners. Disciplines on countervailing actions in deep trade agreements often limit members' recourse to these measures vis-à-vis DTA partners. These disciplines insulate on average 36% of exports of parties: 158 countries are part of DTAs with at least

one key provision regulating countervailing actions (Figure 16.5). This also leaves exports of non-members more exposed to anti-subsidy tariffs that are solely constrained by WTO disciplines.

FIGURE 16.5:   SHARE OF EXPORTS COVERED BY A KEY COUNTERVAILING-DUTY PROVISION
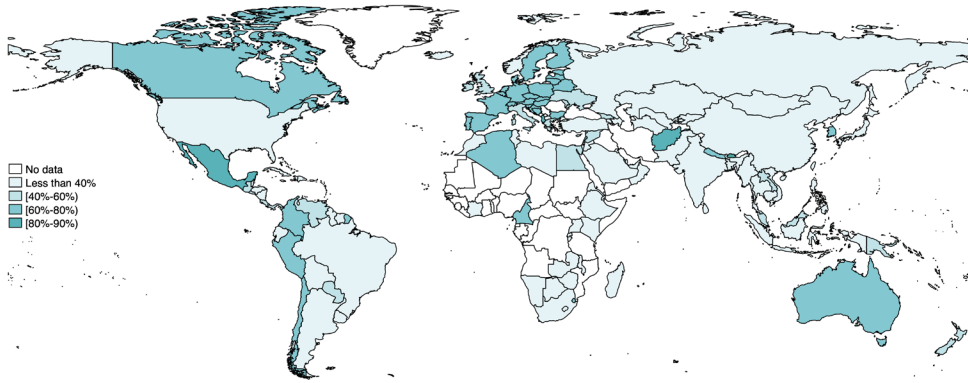
Notes: Share of imports covered by a key countervailing-duty provision over total imports, by country. Key provisions on countervailing actions include: (i) countervailing duties disallowed, (ii) countervailing duties allowed and with specific provisions, and (iii) mutually acceptable solution.

Source: Prusa (2020).

DOMESTIC REGULATION

Another concern is that COVID-19 may lead to regulatory protectionism (precautionism) in response to an increasing aversion to various risks. DTAs cover multiple dimensions of regulations, either aiming at some form of regulatory convergence or mutual recognition. While trade disputes on multiple regulatory issues may emerge in the post-COVID-19 world, here we focus on the regulation of data flows: as a move towards digitisation is a highly visible consequence of COVID-19, rules on data flows – e.g. to protect individual privacy and security – may take centre stage.

Data provisions are covered primarily by DTAs between industrial countries (Figure 16.6). As many as 89 countries are part of DTAs with data protection provisions. While widely available information on international data flows is missing, we can use merchandise trade flows as a (admittedly imperfect) proxy for these flows. On average, 34% of exports, from these 89 countries goes to a DTA member. These provisions will be important to promote free flows of data, and hence digital trade more broadly, between members. An increase in regulatory precautionism could hurt digitally driven trade with non-members.

FIGURE 16.6   SHARE OF EXPORTS TO COUNTRIES WITH DATA FLOWS PROVISIONS
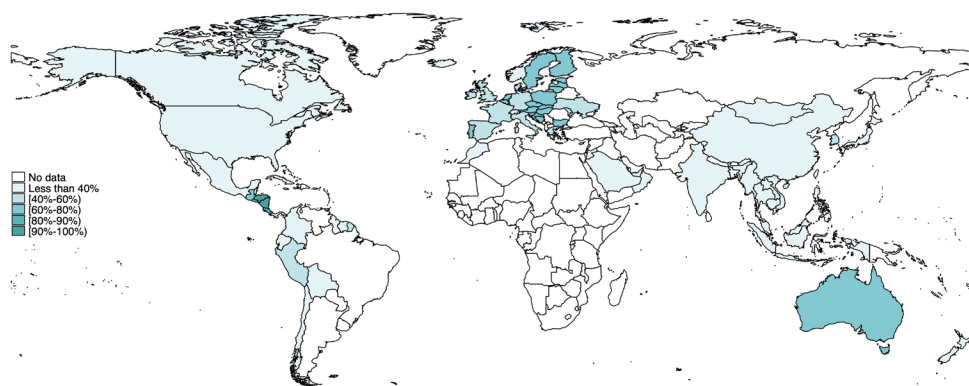
Notes: Share of goods exports covered by a data flow provision over total goods exports, by country.

Source: Gootiiz et al. (2020).

IPR PROTECTION

Protection of IPR emerged as a controversial issue during the pandemic, most recently concerning the production of COVID-19 vaccines. A proposal led by India and South Africa at the WTO requested suspension of certain multilateral trade disciplines on IPR. While at present the most pressing challenges in boosting global vaccine production may lie elsewhere (see Evenett et al. 2021), in a world where innovation and production of medical products is highly concentrated and demand diffused, tensions on these issues are likely to persist.

DTAs involving the US and the EU deepen IPR protection beyond what is included in the WTO agreements in ways that may be important during a pandemic. In particular, these agreements extend IPR protection to undisclosed information such as test data for new pharmaceutical products: 47 countries – including the 27 EU members – are part of 34 DTAs that cover at least one IPR data protection provision (Figure 16.7). By extending IPR protection, these provisions may influence the location choices of companies that manufacture vaccines or medical products that rely on protected patents, thus ultimately affecting the geography of production of these goods.

FIGURE 16.7   IPR DATA PROTECTION PROVISIONS IN EU AND US DTAS
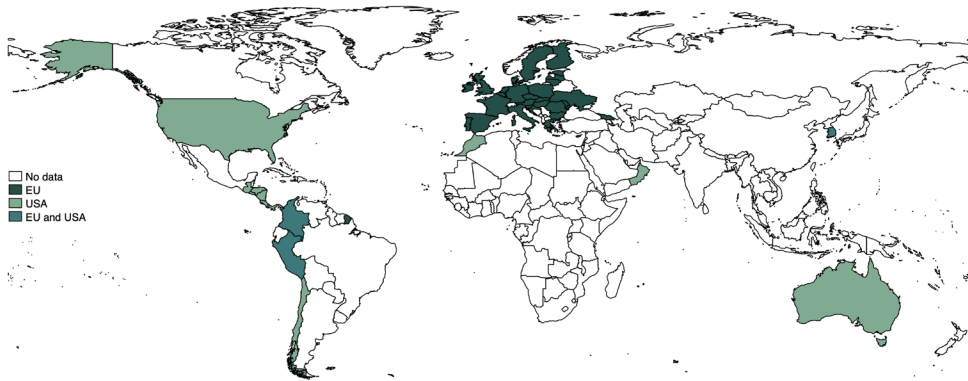
Notes: Key IPR data protection provisions: [The agreement] (i) provides minimum term of protection for undisclosed test or other data for a new pharmaceutical product; (ii) provides minimum term of protection for new clinical info for a new indication/formulation/administration method of a previously approved pharmaceutical product; (iii) provides minimum term of protection for undisclosed test or other data for a pharmaceutical product containing a chemical entity not previously approved by either party; (iv) provides minimum term of protection for undisclosed test or other data for a new pharmaceutical product that is or contains a biologic.

Source: Wu (2020b).

CONCLUSIONS

The deepening of regional trade agreements helped shape world trade and global value chains in the past 30 years. But while regionalism has mostly complemented multilateralism in a cooperative environment, this may be less true in a post-COVID-19 world characterised by enduring trade tensions, occasional conflict, and uncertainties on the future of multilateral trade rules and enforcement. In this context, DTAs may shield and promote trade between members while directing protectionist pressures towards non-members. The result could be a more fragmented world. The revival of meaningful multilateralism is needed to complement DTAs in a post-COVID-19 world.

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CENTRE FOR ECONOMIC POLICY RESEARCH

While multilateral trade negotiations have stagnated and tensions between major players have surged, bilateral and regional agreements seem to have run away with the trade agenda. There are over 300 agreements today up from 50 in 1990. Most importantly, many of these agreements have extended their reach well beyond tariffs, aiming to achieve integration beyond trade, or "deep" integration.

This CEPR-World Bank eBook brings together leading experts in international trade from academia and policy institutions to provide new analysis on the determinants of deep trade agreements, how they affect trade and non-trade outcomes, and how they might shape trade relations in a post-COVID-19 world.