The Value of Deep Trade Agreements in the Presence of Pricing-to-Market

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Abstract

Do preferential trade agreements (PTAs) lead to greater market integration, more intense competition and less market power for firms? In this paper, we integrate the detailed data on 257 preferential trade agreements from the World Bank's Deep Trade Agreements (DTA) database with administrative customs datasets of product-level exports by firms from thirteen developing and emerging countries to estimate the responsiveness of firm-level exports, export prices, and destination-specific markups to trade and domestic policy commitments enshrined in deep trade agreements. Our preliminary findings suggest that both the direct and indirect effects of deep trade agreement provisions on export sales are quantitatively significant. Perhaps more interestingly, we find suggestive evidence of a pro-competitive effect of PTAs.

JEL classification: F13, F14, F15

Keywords: trade agreements, gravity model, markup elasticity, trade elasticity, rules of origin, mutual recognition, firm level data.

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1 Introduction

The vast majority of exporters produce multiple products and sell their wares globally in multiple countries. International pricing strategies are influenced by the degree of competition facing firms in each foreign country. This, in turn, depends on the nature of the product being sold, the number and size of direct competitors, and local institutions and domestic regulatory policies, including those which are affected by a country's participation in bilateral, regional or multilateral trade agreements.

How do the complex features of international trade agreements impact the choices of globally engaged firms? Do preferential trade agreements (PTAs) lead to greater market integration, more intense competition and less destination-specific market power for firms? In this paper, we integrate the detailed data on 257 preferential trade agreements from the World Bank's Deep Trade Agreements (DTA) database with administrative customs datasets of product-level exports by firms from thirteen developing and emerging countries to estimate the responsiveness of firm-level exports, export prices, and destination-specific markups to trade and domestic policy commitments enshrined in deep trade agreements.

Recent empirical research using the universe of international trade transactions for the UK over 2010-2017 (Corsetti, Crowley and Han (2018)) and for China over 2000-2014 (Corsetti, Crowley, Han and Song (2018)) has found that exporting firms that serve multiple foreign markets use different pricing strategies according to observable characteristics of the good being traded, the firm's corporate structure, and the currency in which the transaction is invoiced. This research introduced a new, unbiased trade-pattern-sequential-fixed-effects (TPSFE) estimator to analyse the adjustments of markups and sales volumes by multi-destination exporters in response to destination-specific changes in market conditions. This estimator successfully identifies the destination-specific markup elasticity by controlling for unobserved marginal costs in large unbalanced panels where the set of markets served by firms varies endogenously with local market conditions. These studies have advanced our quantitative understanding of the extent to which firms utilize a global versus a local strategy for setting prices. Of particular importance is the finding that pricing-to-market (or, equivalently, the adjustment of markups in local destinations in response to local destination variables such the origin-destination exchange rate) is more significant in consumption goods relative to intermediates, goods which are highly differentiated (i.e., automobiles and consumer electronics), goods which originate from foreign-invested firms, and goods whose sale is invoiced in the local currency of the

destination. This raises the question of which features of the local destination market contribute to an environment in which foreign exporters can exploit their market power and utilize pricing-to-market strategies.

In this paper, we develop a new approach to evaluating how provisions in deep trade agreements that confer a benefit to a trading partner impact firm-level export sales and markups. Of particular interest in our study is quantifying how any deep trade agreement provisions between a destination and its trading partners impact trade from origin countries that do not participate in the deep trade agreement, after controlling for multilateral resistance in the origin and destination. In other words, we examine if preferential trade agreements lead to more intense competition and less destination-specific market power for firms that are outside the agreement.

Our approach builds on the basic insight from the structural gravity literature that changes in prices which reflect PTA-induced changes in the competitive environment in origin and destination countries can be absorbed in time-varying multilateral resistance terms (origin-product-time and destination-product-time fixed effects, as in Anderson and van Wincoop (2003); Feenstra (2004); Redding and Venables (2004); Baier and Bergstrand (2007); Head and Mayer (2014); Baier, Bergstrand and Feng (2014); Mattoo, Mulabdic and Ruta (2017)). Our analysis focuses on bilateral barriers to market access for a firm in origin o exporting to destination d. We consider both direct barriers to market access associated with destination d's policy toward country o as well as any indirect limits to market access that firms from origin o experience as competition from third-country exporters which face a different set of trade policies in destination d.

The direct measures of market access we study include the existence of a PTA, product-level preferential tariffs on imports, and deep trade agreement provisions that further facilitate market access; specifically, rules regarding the documentation necessary to show a good satisfies a PTA's rules of origin and rules regarding mutual recognition of standards or conformity assessment. We introduce the use of trade-weighted measures of policies facing third-country exporters to destination d as proxies that capture the indirect effect of the intensity of competition in the destination on the sales and pricing decisions of firms exporting from origin o. These indirect proxies for the intensity of the competition include a trade-weighted measure of PTAs between the destination and third countries, the trade-weighted average tariff facing exporters from third countries, and trade-weighted measures that reflect how widely a particular deep trade agreement provision is available to exporters from third countries.

Our research builds on a methodologically diverse body of work examining how prices and markups change in response to trade policy changes (De Loecker, Goldberg, Khandelwal and Pavcnik (2016), Amiti and Konings (2007), Konings and Vandenbussche (2005), Bown and Crowley (2006), Pierce (2011)). A novel feature of our approach is its examination of how third-country competition impacts prices and markups, building on previous models of trade policy "spillovers" into bilateral trade relations (Chang and Winters (2002), Bown and Crowley (2007), Lee, Mulabdic and Ruta (2019)) and empirical work on exporting firms' cross-market supply responses to changes in destination market markups (Corsetti, Crowley, Han and Song (2018)).

Our preliminary findings suggest that both the direct and indirect effects of deep trade agreement provisions on export sales are quantitatively significant. Perhaps more interestingly, we find suggestive evidence of a pro-competitive effect of PTAs. After controlling for time-varying multilateral resistance in a destination, a firm's product-level markup in a destination tends to decline when its origin country participates in a PTA with a destination. While PTAs appear to be associated with lower markups overall, specific provisions related to rules of origin and mutual recognition are associated with higher markups. Additionally, when we restrict our analysis to highly differentiated goods, we estimate a sizeable elasticity of a firm's product-level markup to its tariff in that destination as well as to a weighted average of tariffs faced by its third-country competitors in the destination. For these highly differentiated goods over which firms presumably have greater market power, our preliminary findings suggest higher tariffs facilitate higher markups.

2 Empirical Strategy

Our starting point is the canonical expression of the gravity equation from Baier and Bergstrand (2007), as presented by Limão (2016), adapted to data of firms' product level exports from multiple origin countries o to all destination countries d. It models trade flows as a function of preferential trade agreements (PTAs) and a set of fixed effects.

$$ln(v_{fodit}) = \beta_1 * pta_{odt} + \delta_{foit} + \delta_{dit} + (\delta_{od}) + \epsilon_{fodit} \tag{1}$$

The dependent variable $ln(v_{fodit})$ is the natural logarithm of the value of firm f's exports of products i from origin o to destination d at time t. pta_{odt} is an

indicator for whether the origin and the destination have an active trade agreement in year t. The three sets of fixed effects capture variation at the firm-origin-product-time (δ_{foit}), destination-product-time (δ_{dit}) and origin-destination levels (δ_{od}).[1] The origin-product-time element of the firm-product-origin-time fixed effects (δ_{foit}) and the destination-product-time fixed effects (δ_{dit}) capture multilateral resistance terms, as is standard in the gravity literature (Anderson and van Wincoop, 2003; Feenstra, 2004; Redding and Venables, 2004; Head and Mayer, 2014; Baier, Bergstrand and Feng, 2014). The inclusion of the more detailed firm-product-origin-time fixed effects allows us to control for time-varying conditions of supply at the level of the product within a firm in an origin. We include origin-destination (δ_{od}) fixed effects to capture typical gravity covariates, such as distance, language, etc. to reduce endogeneity concerns surrounding estimation of the effect of a preferential trade agreement (Baier and Bergstrand, 2007).

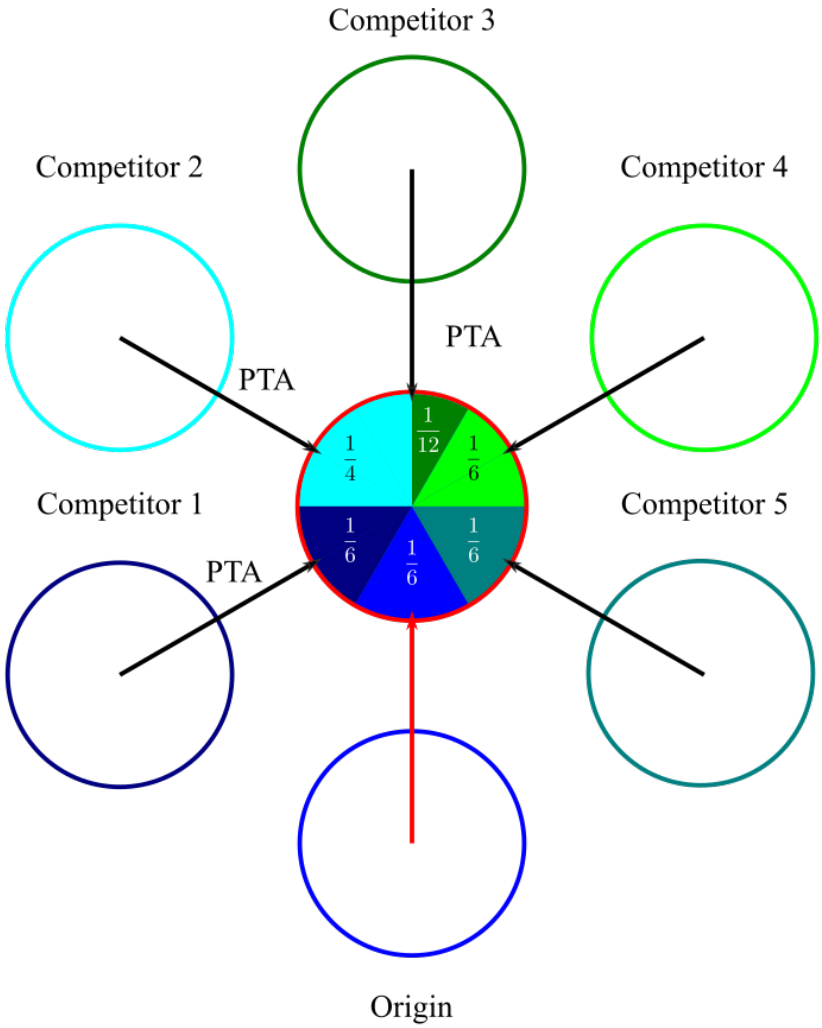
Equation 1 allows us to investigate the effect of PTAs between an origin and a destination on their bilateral trade flows as well as how this effect changes with the inclusion of country-pair fixed effects. Since we are interested in how market access is affected by both PTAs between the origin and the destination and PTAs between the origin's competitors and the destination, we extend equation 1 to equation 2.

$$\begin{aligned} ln(v_{fodit}) = \beta_1 * pta_{odt} + \beta_2 * competitor\_pta_{(-o)dit} + \\ + \delta_{foit} + \delta_{dit} + \ (\delta_{od}) + \epsilon_{fodit} \end{aligned} \tag{2}$$

This equation features an additional variable, $competitor\_pta_{(-o)dit}$, that proxies for the third-country competition an exporting firm from origin o faces in destination d. This variable represents the weighted proportion of an origin country's competitors which have access to an active trade agreement with the destination, using the previous period's trade shares as weights. The coefficient β_2 is a semi-elasticity and the statistic $100*(e^{x*\beta_2}-1)$ represents the percentage change in a firm's product-level export values in response to another x percent of the origin's competitors gaining access to a PTA with the destination.

To create this variable, which is illustrated in figure 1 and defined in table 1, we first multiply the trade share of each of the origin's competitors in the destination in the previous period with an indicator for whether this competitor and the destination currently have an active trade agreement. We then sum across these countries to find the trade weighted share of countries, excluding the origin, with access to a PTA with

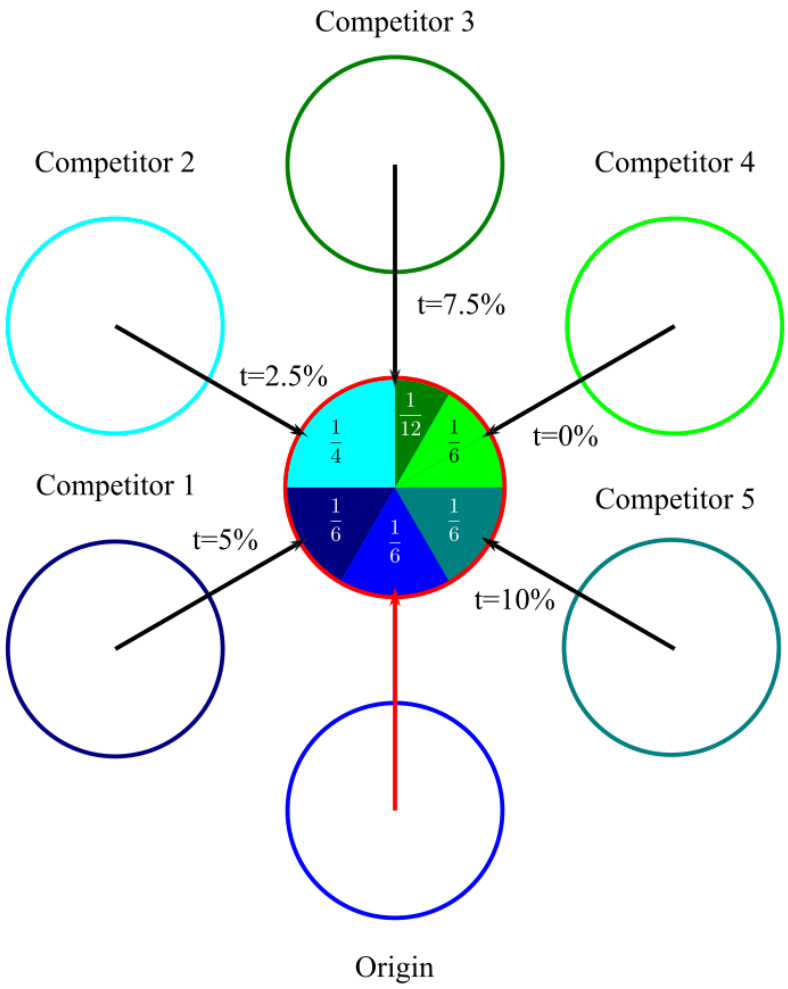
[1] The parentheses around δ_{od} in equation (1) indicate that our analysis will include specifications with and without origin-destination fixed effects.



$$competitor\ pta = \frac{\frac{1}{6} * 1 + \frac{1}{4} * 1 + \frac{1}{12} * 1 + \frac{1}{6} * 0 + \frac{1}{6} * 0}{\frac{1}{6} + \frac{1}{4} + \frac{1}{12} + \frac{1}{6} + \frac{1}{6}} = 0.6$$

Figure 1: Calculating the Proportion of Competitors with Access to a PTA

Note: This figure illustrates how we calculate the variable $competitor\_pta_{(-o)dit}$, which captures the effect of competitors' trade agreements on trade flows. Consider a scenario in which our origin country of interest, the deep blue circle at the bottom, competes with five other countries, the five other blue and green circles on the sides, to sell a given product in a destination, the red circle in the centre. Suppose that the previous year's $(t-1)$ trade shares of the six exporting countries are given by the numbers in the figure. We start by multiplying each of the five competitors' trade shares in the previous year with an indicator for whether this competitor currently has access to a PTA with the destination and then adding these terms together. This is shown in the numerator of the equation at the bottom of the figure. To avoid creating a mechanical relationship between our variable and the origin's trade share, we further normalize by dividing by the total trade share of all five competitors in the previous year. This is the rationale behind the denominator. In this example, our calculations reveal that 60% of the origin country's competitors in the product we are considering have access to a PTA with the destination.



$$competitor\ t = \frac{\frac{1}{6} * 5 + \frac{1}{4} * 2.5 + \frac{1}{12} * 7.5 + \frac{1}{6} * 0 + \frac{1}{6} * 10}{\frac{1}{6} + \frac{1}{4} + \frac{1}{12} + \frac{1}{6} + \frac{1}{6}} = 4.5\%$$

Figure 2: Calculating the Average Tariff Faced by Competitors

Note: This figure illustrates how we calculate the variable $competitor\_t_{(-o)dit}$, which captures the effect of the average tariff faced by a country's competitors on trade flows. The calculation in this graph is almost identical to that presented in figure 1, with the exception that we use bilateral tariff rates rather than PTA status indicators to construct this variable. As before, the blue circle at the bottom represent an origin country which is competing with five other countries, the remaining blue and green circles, to sell a given product in a destination, the red circle in the centre. The numbers in the centre red circle again indicate the trade shares of these countries in the previous year $(t-1)$. We start by multiplying each of the five competitors' trade shares in the previous year with the bilateral tariff they currently face in the destination and then adding these terms together. This is shown in the numerator of the equation at the bottom of the figure. To avoid creating a mechanical relationship between our variable and the origin's trade share, we further normalize by dividing by the total trade share of all five competitors in the previous year. This is the rationale behind the denominator. In this example, our calculations reveal that the origin country's competitors face an average tariff of 4.5% in the product we are considering.

Table 1: Variable Definitions

Variable	Definition
$competitor\_pta_{odit}$	$\frac{\sum_{c \in C \neq o} pta_{cdt} \times trade\_share_{cdit-1}}{\sum_{c \in C \neq o} trade\_share_{cdit-1}}$
	past trade share weighted proportion of competitors c in product i with access to a trade agreement with destination d at time t
$competitor\_provision_{odit}$	$\frac{\sum_{c \in C \neq o} provision_{cdt} \times trade\_share_{cdit-1}}{\sum_{c \in C \neq o} trade\_share_{cdit-1}}$
	past trade share weighted proportion of competitors c in product i with access to a given provision in a trade agreement with destination d at time t
$competitor\_\tau_{odit}$	$\frac{\sum_{c \in C \neq o} bilateral\_\tau_{cdit} \times trade\_share_{cdit-1}}{\sum_{c \in C \neq o} trade\_share_{cdit-1}}$
	past trade share weighted average tariff faced by competitors c in destination d and product i at time t

the destination. To turn this into the proportion of the origin's competitors who benefit from preferential treatment, we normalise by dividing by the total trade share of the origin's competitors in the destination in the previous period. As we use product level trade shares in these calculations, $competitor\_pta_{(-o)dit}$ varies across products as well as across country pairs and time. This means that $competitor\_pta_{odit}$ can take different values for different products within a given origin-destination country pair and year, provided there is variation in the product-level trade shares of the origin's competitors in the destination in the previous year.[2]

To allow us to investigate the competitive effects of a broader set of trade policies, our main specification, presented in equation 3, adds tariffs and specific trade agreement provisions to equation 2. This helps us to identify which elements of a preferential trade agreement have the strongest effects on the competitive behaviour of firms.

[2]As a robustness check, we also constructed competitor variables using the product-level import shares of competitor countries averaged over years $t-1$ to $t-3$ and obtain similar estimation results.

$$
\begin{aligned}
ln(v_{fodit}) = {} & \beta_1 * pta_{odt} + \beta_2 * competitor\_pta_{(-o)dit} \\
& + \beta_3 * ln(1 + bilateral\_\tau_{odit}) + \beta_4 * ln(1 + competitor\_\tau_{(-o)dit}) \\
& + \beta_5 * provision_{odt} + \beta_6 * competitor\_provision_{(-o)dit} \\
& + \delta_{foit} + \delta_{dit} + \ (\delta_{od}) + \epsilon_{fodit}
\end{aligned} \tag{3}
$$

There are four new variables in this specification, two relating to the destination's trade policy towards the origin and two relating to the destination's trade policy towards the origin's competitors. The first two capture the direct effect of the PTA on trade between the origin and destination; $ln(1+bilateral\_\tau_{odit})$ denotes the natural logarithm of one plus the tariff the destination charges on imports of product i from the origin while $provision_{odt}$ is an indicator for whether the origin and the destination currently have a specific deep trade agreement provision in any of their active trade agreements.[3] The second two variables are trade-weighted measures of policies facing the origin's competitors, defined analogously to $competitor\_pta_{(-o)dit}$. The variable $ln(1+competitor\_\tau_{(-o)dit})$, illustrated in figure 2, represents the natural logarithm of one plus the weighted tariff faced by the origin's competitors in a given product in the destination while the variable $competitor\_provision_{odit}$ is the weighted average of an origin country's competitors which have access to a given deep trade agreement provision in any currently active trade agreement with the destination.[4]

In considering the competitive effects of deep trade agreement provisions, we draw a distinction between provisions which exclusively alter the trade costs between the origin and the destination ("bilateral provisions") and provisions which lead the destination to change its behaviour in a way that affects all of its trade partners ("multilateral provisions").[5] We center our empirical analysis on deep trade agreement provisions that appear to offer preferential treatment within a bilateral pair.

[3] This empirical specification is similar to that used by Bown and Crowley (2007) to capture the third-country "trade deflection and trade depression" effects of antidumping policy.

[4] Studies on the take-up rate of preferential tariffs have shown that PTA partners do not always take advantage of preferential tariffs. We set this complication aside and implicitly assume that the availability of lower, preferential tariffs increases competitive pressures in destination country d.

[5] An example of a bilateral provision would be a commitment to allow firms from a partner country to submit customs documentation electronically, while an example of a multilateral provision would be a commitment to create a digital customs infrastructure. In the former case only the partner country benefits, whereas in the latter all countries which export to the destination stand to gain.

2.1 Third-country competition effects on prices and markups

We use a similar empirical strategy to examine both the direct and indirect, third-country, impacts of preferential trade agreements on prices and markups. We begin with a pricing equation similar to (3) which includes both the direct and third-country competitors' effects of PTAs, tariffs, and trade agreement provisions.[6]

$$\begin{aligned} ln(p_{fodit}) = & \beta_1 * pta_{odt} + \beta_2 * competitor\_pta_{(-o)dit} \\ & + \beta_3 * ln(1 + bilateral\_\tau_{odit}) + \beta_4 * ln(1 + competitor\_\tau_{(-o)dit}) \\ & + \beta_5 * provision_{odt} + \beta_6 * competitor\_provision_{(-o)dit} \\ & + \delta_{dit} + (\delta_f \& \delta_{oit}) \text{ or } (\delta_{od} \& \delta_{oit}) \text{ or } \delta_{foit} + \epsilon_{fiodt} \end{aligned} \tag{4}$$

The dependent variable is the natural log of the unit value of a product i sold by firm f located in origin o to destination d in year t. In the last row of equation (4), we indicate that our analysis of prices or markups will proceed by including one of three possible sets of fixed effects, for the firm, for the origin-destination pair, or for the product sold by a firm located within an origin in a given year. When the pricing specification includes firm fixed effects (δ_f), variation related to a firm's time-invariant productivity, size, or, indirectly, market power, is absorbed by the fixed effect so that we can interpret the magnitude of both the direct and third country effects arising from PTAs, tariffs, or trade agreement provisions as the responsiveness for an average firm in our thirteen country exporter's dataset. In contrast, the inclusion of an origin-destination fixed effect (δ_{od}) absorbs pricing variation associated with time-invariant features such as distance (Bastos and Silva (2010)) or via, for example, the Alchian-Allen effect (Hummels and Skiba (2004)). For example, if prices within a bilateral pair are generally higher or lower relative to the average for a product in the destination, this control will allow us to identify the average effect of policy on prices across all bilateral pairs.

Lastly, when the log unit value (price) is the dependent variable, the inclusion of firm-origin-product-time fixed effects controls for time-varying marginal costs at the level of the product within a firm as well as time-variation in the global or common markup that the firm charges in all foreign destinations (Corsetti, Crowley, Han and Song (2018)). This specification allows us to identify how the component of the markup that is specific to a destination (i.e., the pricing-to-market component) changes when a country joins a PTA, has competitors join a PTA in a destination,

[6]The inclusion of third country trade policies in an empirical model of prices follows Bown and Crowley (2006).

faces tariff changes in the destination, etc.

Because destination-product-time fixed effects are included in all price and markup specifications, our analysis always controls for changes in multilateral resistance in a destination-product pair. Thus, if a destination's participation in a PTA is pro-competitive, inducing a fall in average prices or markups, this effect is captured by the δ_{dit} fixed effect. Our use of direct PTA, tariff, and trade agreement provision variables as well as trade-weighted competitors' variables enables us to decompose the remaining variation in prices and markups by exporters into (partial) pro-competitive effects of direct policy changes as well as those due to increased competition from policy changes against competitors.[7]

3 Data

To investigate how deep trade agreement provisions affect the sales and pricing decisions of firms, we bring together information on i) firms' product-level export values and quantities from thirteen countries, ii) product-level imports from 250 countries, iii) 257 preferential trade agreements, and iv) bilateral tariffs from 165 countries. Our final dataset spans the years 1993-2016 and contains 27,549,039 firm-product-origin-destination-year quintuplets, of which 84% are from 2000-2006, 91% from 2000-2009 and 98% from 2000-2012.

3.1 Firm-Level Trade

We use administrative data on the universe of firms-level exports for 13 developing and emerging economies, sourced from three different sources. Data for Albania, Bulgaria, Burkina Faso, Guatemala, Jordan, Malawi, Mexico, Peru, Senegal, Uruguay and Yemen are taken from the World Bank Exporter Dynamics Database, data for Egypt from the Economic Research Forum Exports Dataset and data for China from the Chinese Customs Database.[8] Apart from the Chinese Customs Database, which contains monthly data on 8-digit Harmonised System (HS) products, these datasets provide information on the value and volume of annual firm-level exports of 6-digit HS products to various destinations. To ensure the data are comparable and easily

[7] In future work, we plan to expand our study of markups by implementing the trade patterns sequential fixed effect estimator of Corsetti, Crowley, Han and Song (2018) which will better enable us to control for composition changes in the mix of products sold within a HS06 product code associated with firm-product entry into and exit from different destinations.

[8] For more information about the World Bank Exporter Dynamics Database, see Cebeci, Fernandes, Freund and Pierola (2012) and Bortoluzzi, Fernandes and Pierola (2015).

matched to our tariff and commodity classification data, we aggregate the Chinese data to the annual and 6-digit HS product levels. As summarised in table 2, data for different countries is available for different years. Export values are free on board figures reported in US dollars for all countries other than Senegal, for which export values represent cost, insurance and freight figures. With the exception of China and Egypt, which use a variety of measures, export volumes are reported as net weight in kilograms. Data on this variable are not available for Guatemala and Jordan, and not available for all years for Mexico. Similar to other studies using administrative data, we use trade unit values as a proxy for prices.

Table 2: Firm-Level Trade Data: Countries and Years

Country	Years	Value	Volume	Firms	Observations	... with PTA	... with Competitor PTA
Albania	2004-2012	✓	✓	6, 314	69, 788	6, 090	53, 511
Burkina Faso	2005-2007	✓	✓	718	6, 692	3, 413	4, 808
	2008-2012	✓	✓	1, 173	10, 606	6,016	7, 936
Bulgaria	2001-2006	✓	✓	50, 788	835, 042	524, 232	684, 753
China	2000-2006	✓	✓	230, 339	20, 043, 171	1, 168, 391	15, 635, 899
Egypt	2005-2016	✓	✓	24, 150	815, 819	658, 215	644, 381
Guatemala	2005-2013	✓		13, 635	505, 809	288, 229	405, 090
Jordan	2003-2012	✓		7, 356	113, 608	85,279	70, 057
Mexico	2000-2007	✓		112, 826	2, 146, 259	1, 230, 160	1, 666, 231
	2007-2009	✓		59, 719	1, 073, 386	599, 038	869, 610
	2010-2011	✓	✓	47, 881	764, 277	415, 385	631, 294
	2012	✓	✓	34, 684	448, 804	308, 744	368, 904
Malawi	2006-2008	✓	✓	1, 360	9, 832	5, 903	8, 802
	2009-2012	✓	✓	3, 036	21, 476	13, 818	19, 236
Peru	1993-2013	✓	✓	37, 145	1, 150, 110	368, 623	941, 634
Senegal	2000-2012	✓	✓	3, 002	95, 025	44, 955	42, 240
Uruguay	2001-2012	✓	✓	7, 306	141, 163	45, 210	115, 603
Yemen	2008-2012	✓	✓	1, 246	19, 858	11, 533	12, 332

Notes: The columns "...with PTA" and "...with Competitor PTA" report the number of observations for which our pta_{odt} and $competitor\_pta(-o)dit$ variables take positive values. For pta_{odt}, this amounts to the number of observations for which there is an active PTA between the origin and the destination. The variable $competitor\_pta(-o)dit$ appears in our dataset with a positive value if two conditions are met: (1) the destination has an active PTA with a competitor country and (2) the destination had non-zero imports of product i from this competitor in $t-1$. Thus, of 69k export observations from Albania, 53k of these exports were to destinations in which at least one competitor had a PTA.

3.2 Product-Level Imports

To calculate the trade shares which feature in our main independent variables of interest – competitors' PTA, competitors' average tariff, and competitors' access to a specific DTA provision– we use import data at the 6-digit HS level, reported inclusive of cost, insurance and freight, for the years 1990-2016 from UN Comtrade.

3.3 Trade Agreements

Our data on trade agreements comes from the new World Bank Deep Trade Agreements (WB DTA) Database, which contains detailed information on various disaggregated provisions in 257 agreements which entered into force between 1958 and 2015. We focus on four provisions in particular. The first two provisions are related to rules of origin (ROO) and respectively encode whether i) certificates can be issued by the exporter/importer without the need for authentication by a competent (government) authority and ii) certificates have to be issued by competent (government) authorities of the exporting party.[9] The second two provisions are about technical barriers to trade and specify whether the agreement contains i) mutual recognition of standards and ii) mutual recognition of conformity assessment.[10]

3.4 Tariffs

Our data on bilateral ad-valorem tariffs is constructed from data on preferential and applied most favoured nation (MFN) tariffs available on the WTO website.[11] Where destinations report preferential tariffs, we set our bilateral tariff variable equal to

[9]Trade agreement provisions related to rules of origin are found in Chapter 8 of the WB DTA Database. We refer to the first ROO provision as self-certification by the exporting firm. This is a binary variable coded as 1 when the answer to the following question about the PTA is yes. "Can the [origin] certificate be issued on the basis of self-certification by the exporter / producer / importer without need for authentication by the competent authority?" The second ROO provision we study is one indicating that origin certifications must by issued by a government or other designated authority. It is coded as 1 when the answer to the following question is yes. "Does the certificate have to be issued by competent authorities of the exporting party, including customs administrations, other government authorities, and designated private ones?"

[10]Trade agreement provisions related to trade facilitation through mutual recognition are found in Chapter 11 of the WB DTA Database. The first mutual recognition provision is a binary variable coded as 1 when the answer to the following question about the PTA is yes. "Standards: - Is mutual recognition in force?" The second mutual recognition provision is a binary variable equal to 1 when the answer to the following question is yes. "Conformity Assessment - Is mutual recognition in force? "

[11]Preferential and applied MFN tariffs are available for 138 and 165 of the 250 importers in our sample, respectively.

the lowest reported preferential tariff a destination offers to exporters from a given origin. Otherwise, we use data on the MFN tariff applied by the destination.[12]

In many cases, countries do not report their tariff schedules to the WTO every year. Whenever possible, we attempt to impute missing values, following the steps set out in Feenstra and Romalis (2014). For applied MFN tariffs, we replace missing values with the closest preceding value, on the basis that updated tariff schedules are more likely to be available after significant changes. In cases where there is no preceding value, we use the closest subsequent value. For preferential tariffs, which are frequently phased-in after an agreement is negotiated, we attempt to replace missing values with information we extract from the data collected by Feenstra and Romalis (2014).

3.5 Classification of Product Differentiation

Our analysis of markups and pricing-to-market responses is predicated on the idea that some firms hold significant market power in at least some products traded internationally. In prior work (Corsetti, Crowley, Han and Song (2018)), we document that market power and pricing-to-market vary systematically across different types of globally traded products. To investigate the competitive effects of trade policy for different types of products, we employ the CCHS commodity classification system to determine the degree of product differentiation. Our empirical analysis begins with the universe of traded goods. We then restrict our analysis to a sample of highly differentiated goods to determine if the sales values, prices or markups of products in which firms presumably hold more market power respond diferently to trade policy changes.[13]

The CCHS classification sorts products into two distinct groups, high and low differentiation goods, according to a linguistic feature of the Chinese language that is present in China's quantification of export volumes in customs declarations. The core idea is a simple one: traded goods whose quantity is recorded in customs data

[12]We have data on bilateral tariffs for 26,283,633 of the 27,549,039 observations in our final dataset.

[13]Most studies adopt the industry classifications set forth by Rauch (1999), according to which a product is differentiated if it does not trade on organized exchanges and/or its price is not regularly published in industry sales catalogues. While this system is quite powerful in identifying commodities, a drawback is that the vast majority of manufactured goods end up being classified as differentiated. The CCHS classification refines the class of differentiated goods in Rauch into two categories—high and low differentiation. Corsetti, Crowley, Han and Song (2018) calculate that in the Chinese Customs Database 2000-2014, 79.8 percent of observations are classified by Rauch as differentiated. Of these, only 48.6 percent are categorized as highly differentiated under the CCHS Chinese-linguistics-based classification system.

in countable units are more differentiated than goods whose quantity is recorded by weight or volume (e.g., motorcycles and consumer electronics are more differentiated than canned tomato paste or industrial chemicals). In Chinese trade data, we find quantity reported in more than 30 indigenous Chinese units of measure, including distinct words representing the unit count of wheeled vehicles, engines, upper-body clothing articles, etc. Because the choice of the *measure word* used to record a product's quantity is predetermined by Chinese grammar and linguistics, it reflects a good's intrinsic physical features, and pre-dates modern customs systems of recording quantity. By exploiting the distinction between what linguists refer to as count versus mass measure words, we are able to construct a general product classification for the Harmonized System.[14]

3.6 HS Product Classification

Our firm- and product-level trade, tariff and commodity classification data are reported based on the HS product classification system. As our data span a large number of years and the HS system is updated periodically, our data feature five different revisions of the HS system (HS1992, HS1996, HS2002, HS2007 and HS2012). To ensure that the product codes in our analysis are consistent over time, we follow Cebeci (2015) and consolidate HS codes, by identifying networks of related product codes in the HS system and assigning a unique consolidated code to each network. This reduces the number of distinct products in the HS system from 6,293 to 4,039.

4 Results

Firms in the thirteen emerging and developing countries in our dataset trade more with countries with which they form PTAs. However, perhaps somewhat surprisingly, the signing of a PTA between an origin and a destination is associated with a modest decline in the average value of a firm's exports. In table 3 column (1), the baseline specification shows that the existence of a PTA between a country pair is associated with higher firm-level exports, a partial PTA effect of 0.42, or 52% higher trade. At first blush, this estimate seems to be broadly in line with panel data estimates from Baier and Bergstrand (2007) of 0.46 or Limão (2016) of 0.37. However, it is worthwhile noting at the outset that these panel data studies covering global trade flows

[14] See Corsetti, Crowley, Han and Song (2018) for a more extensive discussion of measure words and evidence of how they are used in other East Asian customs recording systems.

over multiple decades obtain their estimates of the partial PTA effect after controlling for time invariant bilateral features of a country-pair such as distance, language, etc. with origin-destination bilateral fixed effects. Our estimate in column (1) excludes any control for bilateral pairs and, hence, is identified off time variation within a bilateral pair associated with the PTA variable as well as cross-sectional variation between bilateral pairs that do or do not form PTAs. The focus of our analysis is on product-level exports by firms which, empirically, have a highly active extensive margin of trade (See, for example, Han (2018).) By omitting a bilateral pair fixed effect, identification is obtained from variation in both the intensive and extensive margin of product-level trade by firms. Specifically, entry or exit that responds to changes in PTA status contribute to the estimated effect. If we introduce a bilateral fixed effect to the specification in column (1) that restricts identification to the intensive margin of trade, then this yields an imprecise partial PTA effect that is statistically indistinguishable from zero.[15] As we proceed with our discussion of results of trade responsiveness, we will present estimates that both exclude and include a bilateral pair fixed effect, recognizing that excluding such a control is unsatisfactory in that it fails to control for gravity variables like distance, but that including this additional control is also somewhat undesirable in that it shuts down some extensive margin adjustments of granular trade flows at the firm-product-destination level.[16]

Table 3 column (2) introduces the proxy measures of third country competition coming from competitors's access to a PTA in the destination and the competitors' average tariff for each product in the destination. It shows that a firm's trade to a destination is decreasing when more competitors in the same product have signed a PTA with the destination. Specifically, the estimate of -1.12 implies that if the share of competitors in a destination with access to a PTA rose by 10%, then the average sales by a firm in the origin to this destination would decline by 10.6%. Further, we see that a firm's exports to a destination are decreasing when the firm's competitors from other origin countries face a lower tariff; a 1 percent decline in the competitors' average tariff is associated with a 4.8% decline in an origin firm's exports. Notably, the inclusion of these third country competition proxies reduces the direct partial PTA effect to 0.34, or a 40% increase in trade (from 52% in column (1)). The direct effect of a 1% tariff reduction on trade similarly falls from 4.0% to 3.7%. Interestingly, in column (3), although the inclusion of origin-destination fixed

[15]Result not in table but available upon request.

[16]The literature has suggested a variety of ways to examine the contribution of the extensive margin of trade. See Hummels and Klenow (2005) and Kehoe and Ruhl (2013).

effects results in much smaller direct effects of PTAs and tariffs on firms' exports, the effects coming from competitors' market access remain substantial. If an additional 10 percent of a firm's competitors sign PTAs with the destination, the firm's export value falls by 3.5%; a 1% decline in the competitors' average tariff leads to a 3.7% decline in trade.

Turning to prices in columns (4) and (5), the standout result is that an exporting firm's price in a destination is increasing in the average tariff its competitors from other origins face in that destination – when tariffs restrict competition from third countries, exporting firms in origin o charge higher prices in destination d. The pricing specification in column (4) controls for firm fixed effects, absorbing variation related to a firm's time-invariant productivity, size, or, indirectly, market power while the specification in column (5) controls for origin-destination features such as distance that could be associated with price levels that are generally higher or lower within a bilateral pair relative to the average for a product in the destination via, for example, the Alchian-Allen effect (Hummels and Skiba (2004)) or destination preference for quality (Bastos and Silva (2010)). Regardless of whether we use firm or origin-destination fixed effects, the direct effect of a PTA on prices is a modest reduction. Turning to the effect of the competitors' average tariff, we find a 1% increase in the average tariff on third country imports is associated with a 0.45% (0.86%) increase in the price charged by an origin firm after controlling for firm (origin-destination) fixed effects. We think this finding is interesting and important because our measure shows the existence of a pro-competitive effect arising from tariff reductions on third countries after we have controlled for changes in multilateral resistance in the destination (Anderson and van Wincoop (2003)).[17]

Finally, we turn to markups. In specification (6), in which the log unit value (price) is the dependent variable, the inclusion of firm-origin-product-time fixed effects controls for time-varying marginal costs at the level of the product within a firm as well as time-variation in the global or common markup that the firm charges in all foreign destinations. This allows us to identify how the component of the markup that is specific to a destination (i.e., the pricing-to-market component) changes when a country joins a PTA. We find that markups are slightly (4%) lower when a firm has a PTA with a destination, but in this specification, the policies that competitors face have no measureable impacts on markups.

[17]The finding in column (4) that export prices do not respond to tariff cuts is consistent with recent studies that find zero pass-through of US tariff cuts to export prices (cite Amiti also Fajgelbaum and Besedes, Kohl and Lake (2020)), but is surprising in light of optimal tariff theory (cite broda-limao-weinstein and others).

Table 3: PTA and competition effects in Deep Trade Agreements

	Value (1)	Value (2)	Value (3)	Prices (4)	Prices (5)	Markups (6)
PTA_{odt}	0.42***	0.34***	-0.04***	-0.02***	-0.05**	-0.04***
Competitors' Avg $PTA_{(-o)dit}$		-1.12***	-0.36***	-0.02	-0.13***	0.01
$Tariff_{odit}$	-4.02***	-3.73***	-1.25***	0.00	0.24*	-0.03
Competitors' Avg $Tariff_{(-o)dit}$		4.83***	3.71***	0.45*	0.86**	0.25
Observations	16, 338,526	15,543,005	15,542,843	14,256,684	14,257,049	14,238,884
Fixed Effects						
Origin-firm-product-year	✓	✓	✓			✓
Destination-product-year	✓	✓	✓	✓	✓	✓
Origin-destination			✓		✓	
Origin-product-year				✓	✓	
Firm				✓		

Notes: The dependent variable is the log trade value, columns (1) and (2), and log unit value, columns (3) - (6) at the firm-product-origin-destination-year level. In column (6) the inclusion of a origin-firm-product-year fixed effect implies that results are for the markup. Significance: *** p<0.01, ** p<0.05, and * p<0.1 are based on robust standard errors. The robust standard errors and the robustness of each specification to the sample of exporting countries are reported in appendix B.1. Data sources: Thirteen datasets of firms' exports from World Bank Exporter Dynamics Database, China's Customs Authority, and Egypt's Customs Authority.

In table 4, we turn to the question of whether the direct and indirect of PTAs on firm-level export sales, prices, and markups change systematically for those goods which are more highly differentiated. Recall from footnote 13 that roughly one-half of goods classifiied as "differentiated" according to Rauch (1999) are classified by CCHS as highly differentiated. In product markets in which firms hold greater market power, a reduction in barriers to trade such as the tariff facing a third-country competitor would be expected, all else equal, to have a larger pro-competitive effect on prices and markups. Comparing the results from table 3 which are based on all HS06 goods and are reproduced in the odd numbered columns of table 4 to estimates for the sample of CCHS highly differentiated goods (presented in the even numbered columns), we generally find that trade values, prices, and markups of highly differentiated goods are more responsive to tariffs and competitors' tariffs than a general category of merchandise that includes all traded goods. Particularly interesting is the fact that both prices and markups are increasing in the tariff a firm faces in a destination; a 1% increase in the tariff in a destination is associated with a 0.3% increase in the price and a 0.2% increase in the markup. Together, these two facts suggest that two-thirds of the price increase associated with a higher tariff comes from firms charging higher markups in the destination. The third country competition effects are quantitatively even more important than one's own tariff. A

1% increase in the tariff facing a firm's third-country competitors is associated with a 1.6% increase in prices and a 1.4% increase in the markup. Essentially 90% of this price increase is due to the firm raising its destination-specific markup when the average tariff the destination charges on the firm's competitors from other countries is higher.

While our dataset comprises information from 13 exporting countries, the majority of our observations come from China's exports over 2000-2006. Table 5 documents that the broad outline of results from the 13 exporting country sample are robust when we exclude all data from China as an exporter.

Table 4: PTA and competition effects for all goods versus highly differentiated goods

	Value all goods (1)	Value high diff. (2)	Value all goods (3)	Value high diff. (4)	Prices all goods (5)	Prices high diff. (6)	Markups all goods (7)	Markups high diff. (8)
PTA_{odt}	0.34***	0.32***	-0.04***	-0.07*	-0.02***	0.04***	-0.04***	0.00
Competitors' Avg $PTA_{(-o)dit}$	-1.12***	-0.67***	-0.36***	-0.00	-0.02	-0.02	0.01	-0.02
$Tariff_{odit}$	-3.73***	-4.23***	-1.25***	-1.92***	0.00	0.32***	-0.03	0.22***
Competitors' Avg $Tariff_{(-o)dit}$	4.83***	5.90***	3.71***	4.94***	0.45*	1.59***	0.25	1.44***
Observations	15,543,005	5,619,517	15,542,843	5,619,321	14,256,684	5,318,669	14,238,884	5,314,689
Fixed Effects								
Origin-firm-product-year	✓	✓	✓	✓			✓	✓
Destination-product-year	✓	✓	✓	✓	✓	✓	✓	✓
Origin-destination			✓	✓				
Origin-product-year					✓	✓		
Firm					✓	✓		

Notes: The dependent variable is the log trade value, columns (1) and (2), and log unit value, columns (5) - (8), at the firm-product-origin-destination-year level. In columns (7) and (8) the inclusion of a origin-firm-product-year fixed effect implies that results are for the markup. Significance: *** p<0.01, ** p<0.05, and * p<0.1 are based on robust standard errors. The robust standard errors and the robustness of each specification to the sample of exporting countries for specifications (1), (3), (5), and (7) are reported in appendix B.1 and for specifications (2), (4), (6), and (8) in appendix B.2. Data sources: Thirteen datasets of firms' exports World Bank Exporter Dynamics Database, China's Customs Authority, and Egypt's Customs Authority.

Table 5: Competition Effects in Deep Trade Agreements: China's Role

	Value	Value ex. China	Value	Value ex. China	Prices	Prices ex. China	Markups	Markups ex. China
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PTA_{odt}	0.34***	0.51***	-0.04***	-0.01	-0.02***	-0.06**	-0.04***	-0.06***
Competitors' Avg $PTA_{(-o)dit}$	-1.12***	-2.42***	-0.36***	-1.05***	-0.02	0.09	0.01	0.11*
$Tariff_{odit}$	-3.73***	-0.88***	-1.25***	-0.50***	0.00	-0.21*	-0.03	-0.17*
Competitors' Avg $Tariff_{(-o)dit}$	4.83***	6.32***	3.71***	7.39***	0.45**	0.81	0.25	0.23
Observations	15,543,005	2,510,435	15,542,843	2,510,267	14,256,684	1,335,562	14,238,884	1,311,305
Fixed Effects								
Origin-firm-product-year	✓	✓	✓	✓			✓	✓
Destination-product-year	✓	✓	✓	✓	✓	✓	✓	✓
Origin-product-year					✓	✓		
Firm					✓	✓		

Notes: The dependent variable is the log trade value, columns (1) - (4), and log unit value, columns (5) - (8) at the firm-product-origin-destination-year level. Robust standard errors in parentheses. In columns (7) and (8) the inclusion of a origin-firm-product-year fixed effect implies that results are for the markup. Significance: *** p<0.01, ** p<0.05, and * p<0.1 are based on robust standard errors. The robust standard errors and the robustness of each specification to the sample of exporting countries are reported in appendix B.1. Data sources: Thirteen datasets of firms' exports from World Bank Exporter Dynamics Database, China's Customs Authority, and Egypt's Customs Authority. Where noted, all firm-product level exports from China (as an origin) are omitted from the analysis.

4.1 DTA Provisions on Certifying Rules of Origin

We next turn to the detailed provisions in deep trade agreements regarding the documentation to verify that a firm's exports satisfy the rules of origin (ROO) of a preferential trade agreement. We focus on two distinct and mutually exclusive provisions. Firstly, we examine how a provision that allows a firm to self-certify that its exported goods meet the trade agreement's rules of origin impacts the firm's trade. Similarly, we include a trade-weighted measure of the share of a firm's third country competitors who are able to self-certify that their merchandise satisfies the rules of origin of any PTA they have with the destination. Secondly, we examine how a more burdensome evidentiary requirement for proving rules of origin impacts trade.

Interestingly, a firm's average sales are higher when it participates in a trade agreement that allows it to self-certify that it meets a PTA's rules of origin. See the estimates in the first row of table 6. In specifications which omit origin-destination fixed effects, i.e., columns (2), (4) and (5), the inclusion of a self-certification provision in a PTA is associated with firm-level export sales that are 65%, 41% and 39% higher than otherwise. However, it seems highly likely that this provision is introduced into PTAs between bilateral pairs that trade intensively. The inclusion of an origin-destination fixed effect in column (3) results in an estimate of the provision's effect that is indistinguishable from zero. This suggests that the estimated effect of the provision in columns (2), (4) and (5) likely derives from two effects – a possible expansion of the extensive margin of trade for firms which enter the destination market due to lower paperwork requirements and a possibly endogenous introduction of the provision into bilateral agreements with a sizeable intensive margin value of trade.

Perhaps even more interesting is the finding that these provisions are associated with classic Vinerian trade diversion – when this privileged ROO status is extended to more of a firm's competitors, this tends to reduce the firm's sales in the destination in all specifications. Quantitatively larger impacts are observed for highly differentiated goods, where the expansion of this favourable treatment to 10% more competitors reduces average firm-level exports from the origin country by 17.5% (from the column (4) estimate of -1.92). If identification of this effect embeds an origin-destination fixed effect, the negative impact on trade coming from an expansion of favourable ROO treatment to 10% more competitors reduces exports by only 7.9% (from the column (3) estimate of -0.82).

When an exporter must have a government authority provide the necessary docu-

ments to prove that it meets the PTAs rules of origin, the impact on trade is positive, but smaller in magnitude than what can be achieved when a firm is able to self-certify origin (in specifications that omit origin-destination fixed effects, i.e., columns (6), (8), and (9)). In column (7), which identifies the effect of this more burdensome provision from inter-temporal variation in a bilateral pair, the point estimate is a small negative number, broadly in line with the estimate in column (3). More interestingly, we see that when this burdensome requirement that government authorities must provide proof of origin is applied to a firm's competitors in a destination, the point estimates of the impact on the value of firm-level trade from an exporting firm in origin o are positive. That is, the nature of the documentary evidence required to prove that rules of origin are satisfied under a PTA have different effects on third-countries – when a PTA between any two parties allows self-certification of rules of origin, this harms third country competitors (columns (2) though (4)). In contrast, when a PTA between any two parties requires that a government authority be involved in proving compliance with rules of origin, this tends to benefit third countries, perhaps because, in a relative sense, the more burdensome requirements for proving rules of origin are associated with markets that is generally more difficult for third countries to serve. Notably, although the point estimates on the competitors' having the provision are positive, the effect of the competitor's average PTA is generally a large negative number in these specifications, suggesting the two effects might offset. To wrap up our discussion, it is worth examining the findings in column (7) which considers the impact of the more burdensome rules of origin provisions identified from within trading partner variation in adoption of the provision. In this column, we see that a change in the share of competitors that can satisfy the PTAs rules of origin through the more burdensome provision is associated with a decline in sales by firms in origin o. Comparing this result to that in column (3), one interpretation is that any provision allowing third country competitors to achieve a lower tariff rate via meeting a PTA's ROOs tends to reduce exports from origin o, but the magnitude of this effect is smaller when the evidentiary burder is higher in terms of the necessary paperwork.

Table 7 presents the average partial effect on exports of firms in an origin country under different sets of trade policies in destination d. In the baseline model, a PTA is associated with average exports that are 40.5% higher. In columns (2) through (5), we add up the average partial PTA effect and the average effect of the relevant provision to assess the total impact of signing a PTA with different provisions related to certifying rules of origin. Our analysis shows that allowing for exporter self-

certification of rules of origin is incredibly trade-promoting; a PTA which allows self-certification of ROOs raises trade 84.5% for all goods (row 1 column (2)) and 66.5% for highly differentiated goods (row 1 column (4)). This is substantially higher than the estimated effect in a PTA in which a government or government-designated authority must provide rules of origin certification. This more burdensome set of rules raises trade by 65.9% for all goods (row 3 column (2)) and by 55.6% for highly differentiated goods.

The first striking takeaway from this table is that self-certification regimes have a substantially larger trade-facilitating effect relative to government authorization regimes; column (2) reveals that self-certification enhances trade 18.6% (84.5 - 65.9) more while column (4) shows that, within highly differentiated goods, self-certification raises trade 10.9% more than government authorization. The second striking finding in table 7 is that Vinerian trade destruction is substantial when competitors' PTAs include self-certification of ROOs; a counterfactual in which 10% of an origin's competitors in a destination have signed a PTA with self-certification reduces average sales by firms in the origin by between 8 and 25%. In sharp contrast, having 10% more of one's competitors sign a PTA which requires a government or government-approved authority certify ROOs has almost no impact on origin firms' trade. Interestingly, we do observe a small average trade reduction of 6% if we exclude all Chinese exporting firms from our analysis (column (5)). This result, and the one finding a 25% decline in exports when the PTA includes self-certification of competitors (both in column (5)), suggest that exporters in smaller origin countries are more impacted by forces of Vinerian trade destruction than their peers exporting from China.

The results in table 8 show that price effects of ROO provisions are sensitive to both the sample of goods and the sample of exporting countries. One standout result is that the prices of highly differentiated goods are highly responsive to both the tariff an origin faces in destination d as well as the tariff destination d imposes on the origin's competitors, in line with the findings in table 4. Another interesting finding is that when competitors can self-certify ROOs, this exerts downward pressure on prices. In column (1), when 10% more of a firm's competitors can sef-certify ROOs, the average price charged by an exporter from origin o is 1.4% lower.

In table 9, we examine the impact of rule of origin provisions on the destination-specific component of a firm's markup on a product i. Recall that the dependent variable is the log unit value, but the inclusion of firm-product-year fixed effects which control for changes over time in production costs imply that we are are capturing

changes in a firm's destination-specific markup. A firm's markup is higher when a firm can self-certify that it satisfies a PTAs rules of origin; it appears to be lower in at least some specifications when competitors in a destination can self-certify that they meet a PTA's rules of origin requirements. From column (1), we see that markups on goods from an origin country are 6% higher when the firm can self-certify, but markups are also 1.2% lower when 10% of the firm's competitors have signed a PTA that allows for self-certification. This suggests that the competitive pressure on markups from third-countries having better market access exists, but is modest. Interestingly, for highly differentiated goods, competitors' tariffs have a big impact on markups; a 10% increase in the tariffs against a firm's competitors is associated with a 13.7% increase in the firm's markup.

When a PTA requires that a government authority must provide documentation that a firm satisfies rules of origin, there seems to be no clear pattern of a discernible impact on markups. Finally, in the specifications that focus on highly differentiated goods (columns (2) and (6)), we see that exports of highly differentiated goods are more responsive to the tariff a firm faces in a destination and to the average tariff a firm's competitors face in a destination than a general category of all goods.

Table 6: Trade Effects from Rules of Origin Certification in a PTA

	Value all goods (1)	Value all goods (2)	Value OD FE (3)	Value high diff. (4)	Value ex. China (5)	Value all goods (6)	Value OD FE (7)	Value high diff. (8)	Value ex. China (9)
Firm self-certifies origin$_{odt}$		0.50***	0.03	0.35***	0.33***				
Gov't authority certifies origin$_{odt}$						0.30***	-0.06*	0.22**	0.25***
Competitors self-certify origin$_{(-o)dit}$		-1.63***	-0.82***	-1.92***	-1.00***				
Competitors require a gov't authority to certify origin$_{(-o)dit}$						1.20***	-0.21***	0.77***	1.75***
PTA$_{odt}$	0.34***	0.18***	-0.04*	0.22***	0.36***	0.27***	-0.02	0.27***	0.44***
Competitors' Avg PTA$_{(-o)dit}$	-1.12***	-0.03	-0.01	0.29***	-1.59**	-1.37***	-0.31***	-0.82***	-2.89***
Tariff$_{odit}$	-3.73***	-3.31***	-1.25***	-3.86***	-1.14***	-3.44***	-1.26***	-4.08***	-0.60***
Competitors' Avg Tariff$_{(-o)dit}$	4.83***	4.67***	3.79***	3.69***	8.39***	6.12***	3.49***	6.55***	9.06***
Observations	15,543,005	15,543,005	15,533,393	5,619,517	2,510,435	15,543,005	15,542,843	5,619,517	2,510,435
Fixed Effects									
Origin-firm-product-year	✓	✓	✓	✓	✓	✓	✓	✓	✓
Destination-product-year	✓	✓	✓	✓	✓	✓	✓	✓	✓
Origin-destination			✓				✓		

Notes: The dependent variable is the log trade value at the firm-product-origin-destination-year level. Significance: *** p<0.01, ** p<0.05, and * p<0.1 are based on robust standard errors. The robust standard errors and the robustness of each specification to the sample of exporting countries are reported in appendix B.3. Data sources: Thirteen datasets of firms' exports from World Bank Exporter Dynamics Database, China's Customs Authority, and Egypt's Customs Authority. Where noted, all firm-product level exports from China (as an origin) are omitted from the analysis.

Table 7: Quantifying trade impacts from Rules of Origin Certification in a PTA

	Percentage increase in trade				
	all goods	all goods	OD FE	high diff.	ex. China
	(1)	(2)	(3)	(4)	(5)
Origin has a PTA...	40.5				
with self-certification of ROOs		84.5	-3.9	66.5	82.3
with gov't-certification of ROOs		65.9	-5.8	55.6	83.0
10% of Competitors have a PTA...	-10.6				
and ROOs with self-certification		-15.0	-7.9	-14.5	-24.2
and ROOs with gov't-certification		0.0	1.0	0.1	-6.0

Notes: The first three rows present the average impact on a firm's product-level exports associated with its origin country having a PTA that includes a provision that allows a firm to self-certify that it meets ROOs (row 2) or includes a provision that requires a firm to obtain certification of ROOs from a government authority (row 3) based on parameter estimates in table 6. The second three rows present that average impact on a firm's product-level exports associated with 10% of the firm's competitors in destination country d having a PTA with the destination that includes a provision allowing for self-certification of ROOs (row 4) or a provision requiring certification of ROOs by a government authority (row 5). Column (1) presents estimates of the PTA effect when ROO provisions are excluded. Column (2) are based on estimates in using all goods; column (3) based on estimates when origin-destination fixed effects are included in the model with all goods; column (4) restricts the sample to CCHS highly differentiated goods; and column (5) presents estimates for all goods, but excludes China as an export origin.

Table 8: Price Effects from Rules of Origin Certification in a PTA

	Price all goods (1)	Price high diff. (2)	Price ex. China (3)	Price ex. Mexico (4)	Price all goods (5)	Price high diff. (6)	Price ex. China (7)	Price ex. Mexico (8)
Firm self-certifies origin$_{odt}$	0.04**	0.08***	0.09**	0.03				
Gov't authority certifies origin$_{odt}$					-0.01	-0.00	-0.06***	0.04***
Competitors self-certify origin$_{(-o)dit}$	-0.14**	-0.16	0.24*	-0.46***				
Competitors require a gov't authority to certify origin$_{(-o)dit}$					-0.06	-0.08	-0.09	-0.01
PTA$_{odt}$	-0.03***	0.03***	-0.07***	-0.01*	-0.02***	0.04***	-0.04***	-0.03***
Competitors' Avg PTA$_{(-o)dt}$	-0.01	-0.02	0.03	- 0.03	-0.00	0.00	0.10	-0.03
Tariff$_{odit}$	0.01	0.34***	-0.18*	0.07	-0.00	0.32***	-0.29***	0.13*
Competitors' Avg Tariff$_{(-o)dit}$	0.38	1.50***	0.69	0.25	0.37	1.46***	0.69	0.54**
Observations	14,256,684	5,318,669	1,335,562	13,875,515	14,256,684	5,318,669	1,335,562	13,875,515
Fixed Effects								
Origin–product-year	✓	✓	✓	✓	✓	✓	✓	✓
Destination-product-year	✓	✓	✓	✓	✓	✓	✓	✓
Firm	✓	✓	✓	✓	✓	✓	✓	✓

Notes: The dependent variable is the log unit value at the firm-product-origin-destination-year level; the inclusion of a origin-firm-product-year fixed effect implies that all results are for the markup. Significance: *** p<0.01, ** p<0.05, and * p<0.1 are based on robust standard errors. The robust standard errors and the robustness of each specification to the sample of exporting countries are reported in appendix B.4. Data sources: Thirteen datasets of firms' exports from World Bank Exporter Dynamics Database, China's Customs Authority, and Egypt's Customs Authority. Where noted, all firm-product level exports from China and Mexico, respectively, (as an origin) are omitted from the analysis.

Table 9: Markup Effects from Rules of Origin Certification in a PTA

	Markup all goods (1)	Markup high diff. (2)	Markup ex. China (3)	Markup ex. Mexico (4)	Markup all goods (5)	Markup high diff. (6)	Markup ex. China (7)	Markup ex. Mexico (8)
Firm self-certifies origin$_{odt}$	0.06**	0.08***	0.11**	0.05*				
Gov't authority certifies origin$_{odt}$					-0.01	-0.01	-0.06***	0.03**
Competitors self-certify origin$_{(-o)dit}$	-0.12***	-0.13	0.25*	-0.42***				
Competitors require a gov't authority to certify origin$_{(-o)dit}$					-0.06	-0.09*	-0.12	-0.00
PTA$_{odt}$	-0.04***	-0.00	-0.08***	-0.03***	-0.03***	0.00	-0.04***	-0.04***
Competitors' Avg PTA$_{(-o)dit}$	0.03	-0.02	0.06	0.01	0.03	0.01	0.14	0.00
Tariff$_{odit}$	-0.02	0.24***	-0.13	0.01	-0.04	0.21***	-0.24**	0.05
Competitors' Avg Tariff$_{(-o)dit}$	0.20	1.37***	0.14	0.15	0.18	1.30***	0.06	0.42*
Observations	14,238,884	5,314,689	1,311,305	13,858703	14,238,884	5,314,689	1,311,305	13,858703
Fixed Effects								
Origin-firm-product-year	✓	✓	✓	✓	✓	✓	✓	✓
Destination-product-year	✓	✓	✓	✓	✓	✓	✓	✓

Notes: The dependent variable is the log unit value at the firm-product-origin-destination-year level; the inclusion of a origin-firm-product-year fixed effect implies that all results are for the markup. Significance: *** p<0.01, ** p<0.05, and * p<0.1 are based on robust standard errors. The robust standard errors and the robustness of each specification to the sample of exporting countries are reported in appendix B.5. Data sources: Thirteen datasets of firms' exports from World Bank Exporter Dynamics Database, China's Customs Authority, and Egypt's Customs Authority. Where noted, all firm-product level exports from China and Mexico, respectively, (as an origin) are omitted from the analysis.

4.2 Mutual Recognition Provisions in a DTA

The last set of results explore how PTA provisions by which countries commit to mutual recognition of a trading partner's standards, technical regulations or conformity assessment procedures impact trade, prices and markups. These three provisions represent different approaches to cooperation on standards and respectively amount to treating a partner's voluntary standards, mandatory technical regulations and test results the same as their domestic counterparts.[18] In the WB DTA Database, however, they appear to be very closely related; there are only 10 agreements with a provision on mutual recognition of standards, all of which are either treaties or accession agreements relating to either the European Union or the Eurasion Economic Union. Since the same 10 agreements are also the only ones featuring provisions on the mutual recognition of technical regulations, the results for these two provisions are identical and we only report those for mutual recognition of standards. All 10 of these agreements further contain a provision on mutual recognition of conformity assessment, as do 6 other agreements in the dataset.

In addition to promoting trade between members of a PTA, mutual recognition of standards/technical regulations and mutual recognition of conformity assessment provisions also appear to have trade-promoting effects on third countries. As shown in columns (1) and (5) of table 10, all types of mutual recognition provisions are associated with a 64.9% increase in firm-level exports to a destination (from the parameter estimates of 0.50). The magnitude rises to 113.8% for highly differentiated goods (from the parameter estimates of 0.76 in columns (2) and (6)). A 10% increase in the share of competitors with access to a such a provision, meanwhile, seems to increases firm-level exports by 47.4% in the case of standards/technical regulations (column (1) estimate of 3.88) and by 48.1% in the case of conformity assessment (column (5) estimate of 3.93). These magnitudes are somewhat lower, 40.8% and 41.6% respectively, when we examine the impact of an additional 10% of competitors

[18]The World Trade Organisation's Agreement on Technical Barriers to Trade defines a standard as a "document approved by a recognised body, that provides, for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, with which compliance is not mandatory" and a technical regulation as a "document which lays down product characteristics or their related processes and production methods, including the applicable administrative provisions, with which compliance is mandatory." Both "may also include or deal exclusively with terminology, symbols, packaging, marking or labelling requirements as they apply to a product, process or production method." Conformity assessment, meanwhile, is defined as "any procedure used, directly or indirectly, to determine that relevant requirements in technical regulations or standards are fulfilled" and may include "procedures for sampling, testing and inspection; evaluation, verification and assurance of conformity; registration, accreditation and approval as well as their combinations" (WTO, 1994).

enjoying these mutual recognition provisions for trade in highly differentiated goods in columns (2) and (6) (from the parameter estimates 3.42 and 3.48).

This somewhat surprising "competition" effect might be due to the endogeneity of the decision to grant mutual recognition – where countries are already operating very similar standards, technical regulations or conformity assessment regimes, the granting of mutual recognition might simply capture the fact that their markets are already quite integrated. Alternatively, these measures might capture a de facto simplification of the regulatory environment facing exporters. The pronounced similarity of our results for different types of mutual recognition provisions is almost certainly due to the close relationship of these provisions, and the small number of agreements which feature them, in the WB DTA Database. In fact, our results could be quite different if the data contained information on mutual recognition agreements, stand-alone agreements for mutual recognition of conformity assessment (Prayer, 2020). The UK, for example, had access to 6 stand-alone mutual recognition agreements via its EU membership during our sample period, none of which are included in the WB DTA Database.

In table 11, we present the average partial effects on trade for trade agreements that include mutual recognition agreements. The results are striking. Recall that in table 11 we showed that the average partial effect of a PTA by itself was to increase trade by 40.5% . In column (1) of table 11, we see that adding mutual recognition of standards (and technical regulations) to a PTA more that doubles the partial PTA effect; trade increases by 97.2%. The impacts are larger for highly differentiated goods (138.4%) and when we exclude firms from China (157.4%). Notably, the estimated effect of mutual recogntion of conformity assessment (which, as explained earlier, is close to collinear with mutual recognition of standards) is the same. Further, as discussed above, when the destination country extends mutual recognition to 10% more of a firm's competitor countries, this is associated with non-trivial expansion of trade of about 30% for all goods and of about 25% for highly differentiated goods.

Turning to tables 12 and 13, provisions on mutual recognition appear to increase both the prices and markups of firms from PTA partners and third countries. Specifically, firms raise their prices by 3% (column (1) table 12) and their markups by 4.1% (column (1) table 13) in response to gaining access to a mutual recognition provision. Again, the surprising "competition" effect is present. Prices rise by 1.3%-1.4% (columns (1) and (5) table 12) and markups rise by 1.7%-1.8% (columns (1) and (5) table 13) in response to an additional 10% of a firm's competitors gaining access to a mutual recognition provision. However, at least for highly differentiated goods,

which arguably benefit more from mutuall recognition provisions (see table 10), the quantitatively largest impact on markups comes from competitors' tariffs; a 10% increase in the tariff on competitors' merchandise raises an origin's average markup by 8.8%.

Table 10: Trade Effects due to Mutual Recognition (MR) Provisions in a PTA

	Value all goods (1)	Value high diff. (2)	Value ex. China (3)	Value ex. Mexico (4)	Value all goods (5)	Value high diff. (6)	Value ex. China (7)	Value ex. Mexico (8)
Mutual Recog. of Standards$_{odt}$	0.50**	0.76***	0.68***	0.10***				
MR of Conformity Assessment$_{odt}$					0.50***	0.76***	0.68***	0.10***
Competitors enjoy MR of Standards$_{(-o)idt}$	3.88***	3.42***	8.57***	0.84***				
Competitors enjoy MR of Conformity Assess$_{(-o)idt}$					3.93***	3.48***	8.56***	0.84***
PTA$_{odt}$	0.28***	0.22***	0.47***	0.58***	0.28***	0.22***	0.47***	0.58***
Competitors' Avg PTA$_{(-o)dit}$	-1.96***	-1.70***	-2.52***	-0.08	-1.98***	-1.73***	-2.53***	- 0.08
Tariff$_{odit}$	-3.81***	-4.40***	-0.97***	-1.71***	-3.80***	-4.39***	-0.97***	-1.71***
Competitors' Avg Tariff$_{(-o)dit}$	-0.05	-0.01	5.47****	-1.21*	-0.11	-0.09	5.45***	-1.20*
Observations	15,543,005	5,619,517	2,510,435	14,083678	15,543,005	5,619,517	2,510,435	14,083,678
Fixed Effects								
Origin-firm-product-year	✓	✓	✓	✓	✓	✓	✓	✓
Destination-product-year	✓	✓	✓	✓	✓	✓	✓	✓

Notes: The dependent variable is the log value at the firm-product-origin-destination-year level. Significance: *** p<0.01, ** p<0.05, and * p<0.1 are based on robust standard errors. The robust standard errors and the robustness of each specification to the sample of exporting countries are reported in appendix B.6. Data sources: Thirteen datasets of firms' exports from World Bank Exporter Dynamics Database, China's Customs Authority, and Egypt's Customs Authority. Where noted, all firm-product level exports from China and Mexico, respectively, (as an origin) are omitted from the analysis.

Table 11: Quantifying trade impacts from Mutual Recognition Provisions in a PTA

	Percentage increase in trade			
	all goods	high diff.	ex. China	ex. Mexico
	(1)	(2)	(3)	(4)
Origin has a PTA...				
with Mutual Recognition of Standards	97.2	138.4	157.4	89.1
with Mutual Recognition of Conformity Assessment	97.2	138.4	157.4	89.1
10% of Competitors have a PTA...				
with Mutual Recognition of Standards	29.6	25.2	113.3	8.8
with Mutual Recognition of Conformity Assessment	30.1	25.7	113.0	8.8

Notes: The first three rows present the average impact on a firm's product-level exports associated with its origin country having a PTA that includes a provision that allows a firm to self-certify that it meets ROOs (row 2) or includes a provision that requires a firm to obtain certification of ROOs from a government authority (row 3) based on parameter estimates in table 6. The second three rows present that average impact on a firm's product-level exports associated with 10% of the firm's competitors in destination country d having a PTA with the destination that includes a provision allowing for self-certification of ROOs (row 4) or a provision requiring certification of ROOs by a government authority (row 5). Column (1) presents estimates of the PTA effect when ROO provisions are excluded. Column (2) are based on estimates in using all goods; column (3) based on estimates when origin-destination fixed effects are included in the model with all goods; column (4) restricts the sample to CCHS highly differentiated goods; and column (5) presents estimates for all goods, but excludes China as an export origin.

Table 12: Price Effects due to Mutual Recognition (MR) Provisions in a PTA

	Price all goods (1)	Price high diff. (2)	Price ex. China (3)	Price ex. Mexico (4)	Price all goods (5)	Price high diff. (6)	Price ex. China (7)	Price ex. Mexico (8)
Mutual Recog. of Standards$_{odt}$	0.03***	0.02	-0.04*	0.03***				
MR of Conformity Assessment$_{odt}$					0.03***	0.02	-0.04*	0.03***
Competitors enjoy MR of Standards$_{(-o)idt}$	0.14***	0.17***	-0.33*	0.20***				
Competitors enjoy MR of Conformity Assess$_{(-o)idt}$					0.13***	0.17***	-0.34*	0.19***
PTA$_{odt}$	-0.04***	0.03***	-0.05***	-0.03***	-0.04***	0.03***	-0.05***	-0.03***
Competitors' Avg PTA$_{(-o)dt}$	-0.08***	-0.11**	0.11	-0.14***	-0.08***	-0.11**	0.11	-0.14***
Tariff$_{odit}$	-0.04	0.30***	-0.20*	0.04	-0.04	0.30***	-0.20*	0.04
Competitors' Avg Tariff$_{(-o)dit}$	0.17	1.16***	0.93	0.12	0.18	1.17***	0.93	0.13
Observations	14,256,684	5,318,669	1,335,562	13,875,515	14,256,684	5,318,669	1,335,562	13,875,515
Fixed Effects								
Origin-product-year	✓	✓	✓	✓	✓	✓	✓	✓
Destination-product-year	✓	✓	✓	✓	✓	✓	✓	✓
Firm	✓	✓	✓	✓	✓	✓	✓	✓

Notes: The dependent variable is the log value at the firm-product-origin-destination-year level. Significance: *** p<0.01, ** p<0.05, and * p<0.1 are based on robust standard errors. The robust standard errors and the robustness of each specification to the sample of exporting countries are reported in appendix B.7. Data sources: Thirteen datasets of firms' exports from World Bank Exporter Dynamics Database, China's Customs Authority, and Egypt's Customs Authority. Where noted, all firm-product level exports from China and Mexico, respectively, (as an origin) are omitted from the analysis.

Table 13: Markup Effects due to Mutual Recognition (MR) Provisions in a PTA

	Markup all goods (1)	Markup high diff. (2)	Markup ex. China (3)	Markup ex. Mexico (4)	Markup all goods (5)	Markup high diff. (6)	Markup ex. China (7)	Markup ex. Mexico (8)
Mutual Recog. of Standards$_{odt}$	0.04***	0.02	-0.01	0.03***				
MR of Conformity Assessment$_{odt}$					0.04***	0.02	-0.01	0.30***
Competitors enjoy MR of Standards$_{(-o)idt}$	0.18***	0.22***	-0.30*	0.23***				
Competitors enjoy MR of Conformity Assess$_{(-o)idt}$					0.17***	0.22***	-0.31*	0.22***
PTA$_{odt}$	-0.05***	-0.00	-0.06***	-0.04***	-0.05***	-0.00	-0.06***	-0.04***
Competitors' Avg PTA$_{(-o)dt}$	-0.06***	-0.13***	0.13*	-0.11***	-0.06**	-0.13***	0.13*	- 0.11***
Tariff$_{odit}$	-0.08	0.19**	-0.16	-0.03	-0.08	0.20**	-0.16	-0.03
Competitors' Avg Tariff$_{(-o)dit}$	-0.09	0.88*	0.33	-0.07	-0.08	0.89**	0.33	-0.06
Observations	14,238,884	5,314,689	1,311,305	13,858,703	14,238,884	5,314,689	1,311,305	13,858,703
Fixed Effects								
Origin-firm-product-year	✓	✓	✓	✓	✓	✓	✓	✓
Destination-product-year	✓	✓	✓	✓	✓	✓	✓	✓

Notes: The dependent variable is the log unit value at the firm-product-origin-destination-year level; the inclusion of a origin-firm-product-year fixed effect implies that all results are for the markup. Significance: *** p<0.01, ** p<0.05, and * p<0.1 are based on robust standard errors. The robust standard errors and the robustness of each specification to the sample of exporting countries are reported in appendix B.8. Data sources: Thirteen datasets of firms' exports from World Bank Exporter Dynamics Database, China's Customs Authority, and Egypt's Customs Authority. Where noted, all firm-product level exports from China and Mexico, respectively, (as an origin) are omitted from the analysis.

5 Conclusion

This paper introduces a new methodology for examining whether the detailed provisions of preferential trade agreements (PTAs) lead to greater market integration, more intense competition and less market power for firms. In this paper, we show how firm-level exports from multiple countries can be used to assess both the direct and indirect third-country impacts of preferential trade agreements, tariffs, and trade agreement provisions while controlling for multilateral resistance at the product level in both the origin and destination. Our preliminary analysis began with a study of a small number of trade agreement provisions related to rules of origin certification and mutual recognition. However, our methodology can be applied to the hundreds of provisions in the 257 preferential trade agreements from the World Bank's Deep Trade Agreements (DTA) database.

Our study reveals interesting new results about third-country competition. Firstly, we find that while the average partial effect of a PTA is to raise trade 40%, if 10% of one's competitors in a destination have a PTA, this reduces one's exports by about 10%. Interestingly, our analysis of specific provisions demonstrates that the third country competition effect varies substantially with the precise provisions in a PTA. For PTAs that allow one's competitors to self-certify rules of origin, the damage to one's own trade ranges from a decline of 8% to 25%. In contrast, if the PTA signed by one's competitors requires a government authority certify rules of origin, the total impact on one's own trade is close to nil. In sharp contrast, our study of mutual recognitition provisions finds that when one's competitors have signed a PTA that allows for mutual recognition of standards or conformity assessment, a firm's own exports to that destination are higher – the mechanism is unclear, but perhaps is related to regulatory simplification in the destination.

Perhaps more interestingly, we find suggestive evidence of a pro-competitive effect of PTAs. After controlling for time-varying multilateral resistance in a destination, a firm's product-level price and markup in a destination tends to decline when its origin country participates in a PTA with a destination. While PTAs appear to be associated with lower markups overall, the picture gets murkier when we turn to specific provisions related to rules of origin and mutual recognition; the direct effect of both provisions is slightly higher prices and markups. However, the third-country effects of ROO regimes with self-certification appear to be pro-competitive.When we examine all goods from all thirteen exporting countries, we find that a rules of origin provision allowing competitors easier market access via self-certification

leads to lower prices and markups. Altogether, these findings present a complex picture which highlight the important role of specific trade agreement provisions in facilitating or retarding competition. Finally, when we restrict our analysis to highly differentiated goods, we estimate a sizeable elasticity of a firm's product-level markup to its tariff in that destination as well as to a weighted average of tariffs faced by its third-country competitors in the destination. For these highly differentiated goods over which firms presumably have greater market power, our preliminary findings suggest higher tariffs facilitate higher markups.

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A Appendix - Conceptual Approach

We use a conventional gravity estimation equation to estimate the effect of a firm's competitors gaining access to preferential treatment on firm-level behaviour. The main challenge of this approach is that, as highlighted by Head and Mayer (2014), third-country effects in gravity models are mediated via the multilateral terms. To illustrate this point, equations 1 and 2 reproduce the canonical structural gravity model from Head and Mayer (2014), adapted to industry-level panel data.

$$X_{iodt} = \frac{Y_{iot}}{\Omega_{iot}} * \frac{X_{idt}}{\Theta_{idt}} * \phi_{iodt} \tag{1}$$

$$\Omega_{iot} = \sum_{l} \frac{\phi_{ildt} Y_{ilt}}{\Theta_{ilt}} \quad \text{and} \quad \Theta_{idt} = \sum_{l} \frac{\phi_{iolt} Y_{ilt}}{\Omega_{ilt}} \tag{2}$$

The model expresses exports in product i from origin o to destination d at time t, X_{iodt}, as a function of five factors, namely i) the origin's industry-level production, Y_{iot}, ii) the destination's industry-level expenditure X_{idt}, iii) the industry-specific bilateral accessibility of the destination to the origin ϕ_{iodt}, iv) a multilateral resistance term for the origin Ω_{iot} and v) a multilateral resistance term for the destination Θ_{idt}. The total effect of third-country competition is captured by the last multilateral resistance term Θ_{idt}.

To estimate the effects of competition from third countries in a structural gravity setting, we focus on a bilateral interpretation of competition. Specifically, we split the destination's set of trade partners into two mutually exclusive and exhaustive groups for any given origin-destination pair, the country of origin currently under consideration and all of the destination's other trade partners, and create variables reflecting the destination's trade policy towards each group. This effectively results in two bilateral variables, the destination's trade policy towards the origin and the destination's trade policy towards the origin's competitors. Unlike the overall competitive environment in a destination, both of these variables feature not in the multilateral resistance terms (Θ_{idt}), but rather in the industry-specific bilateral accessibility of the destination to the origin (ϕ_{iodt}). Conceptually, this means that we identify the effect of competition on firm-level behaviour by exploiting variation in the competitive pressures faced by different countries of origin in the same destination.

B Appendix - Standard Errors and Robustness

B.1 Robustness and standard errors for table 3, Competition Effects

Table B1: Further results and robustness for trade value - from specification (2) in table 3

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
dta	0.34***	0.34***	0.34***	0.28***	0.51***	0.30***	0.28***	0.33***	0.62***	0.33***	0.34***	0.34***	0.32***	0.34***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
weighted_1_dta	-1.12***	-1.12***	-1.12***	-1.43***	-2.42***	-1.16***	-0.94***	-1.12***	0.28***	-1.12***	-1.21***	-1.12***	-1.13***	-1.12***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.05)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)
l_bilateral_t	-3.73***	-3.72***	-3.75***	-4.11***	-0.88***	-4.13***	-4.76***	-3.83***	-1.61***	-3.75***	-4.86***	-3.77***	-3.71***	-3.74***
	(0.08)	(0.08)	(0.08)	(0.09)	(0.12)	(0.09)	(0.10)	(0.08)	(0.11)	(0.08)	(0.11)	(0.08)	(0.09)	(0.08)
l_weighted_t	4.83***	4.84***	4.80***	4.50***	6.32***	5.32***	6.75***	4.60***	0.44	4.82***	4.18***	4.83***	4.82***	4.89***
	(0.43)	(0.43)	(0.43)	(0.44)	(0.63)	(0.43)	(0.55)	(0.43)	(0.51)	(0.43)	(0.54)	(0.43)	(0.45)	(0.43)
N	15543005	15533520	15539169	15248925	2510435	15233843	15352584	15517132	14083678	15538642	15134772	15522018	15477329	15538593

Std. errors in parentheses. Every specification includes origin-firm-product-year & destination-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B2: Further results and robustness for trade value - from specification (3) in table 3

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
dta	-0.04*	-0.04*	-0.04*	-0.04**	-0.01	-0.04**	-0.01	-0.04*	0.03	-0.04*	-0.12***	-0.04*	-0.03*	-0.04*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
weighted_1_dta	-0.36***	-0.36***	-0.36***	-0.53***	-1.05***	-0.37***	-0.26***	-0.35***	0.35***	-0.36***	-0.39***	-0.36***	-0.34***	-0.35***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.03)	(0.04)	(0.03)	(0.05)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)
l_bilateral_t	-1.25***	-1.24***	-1.26***	-1.44***	-0.50***	-1.48***	-1.33***	-1.31***	-0.86***	-1.27***	-1.34***	-1.26***	-1.37***	-1.25***
	(0.11)	(0.11)	(0.11)	(0.11)	(0.15)	(0.11)	(0.12)	(0.11)	(0.16)	(0.11)	(0.13)	(0.11)	(0.11)	(0.11)
l_weighted_t	3.71***	3.72***	3.68***	3.70***	7.39***	3.99***	3.87***	3.63***	-0.00	3.70***	4.09***	3.67***	3.35***	3.70***
	(0.39)	(0.39)	(0.39)	(0.40)	(0.62)	(0.42)	(0.45)	(0.39)	(0.51)	(0.39)	(0.47)	(0.39)	(0.41)	(0.39)
N	15542843	15533393	15539029	15248769	2510267	15233681	15352430	15516988	14083510	15538493	15134629	15521874	15477173	15538460

Std. errors in parentheses. Every specification includes origin-dest'n, origin-firm-product-year & dest'n-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B3: Further results and robustness for prices - from specification (4) in table 3

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
dta	-0.02***	-0.02***	-0.02***	-0.02***	-0.06***	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***	-0.04***	-0.03***	-0.02***	-0.02***
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
weighted_1_dta	-0.02	-0.02	-0.02	0.02	0.09	-0.01	-0.02	-0.02	-0.04*	-0.02	-0.09***	-0.02	-0.02	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
l_bilateral_t	0.00	0.01	-0.01	-0.00	-0.21*	0.09	0.00	0.00	0.08	0.00	0.02	-0.01	-0.05	0.00
	(0.05)	(0.05)	(0.05)	(0.05)	(0.09)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.08)	(0.05)	(0.06)	(0.05)
l_weighted_t	0.45*	0.46*	0.43*	0.68***	0.81	0.97***	0.45*	0.45*	0.55**	0.41*	-0.36	0.48*	0.31	0.47*
	(0.20)	(0.20)	(0.20)	(0.21)	(0.54)	(0.26)	(0.20)	(0.20)	(0.20)	(0.20)	(0.24)	(0.20)	(0.22)	(0.20)
N	14256684	14247594	14252977	13969084	1335562	13954072	14256684	14256684	13875515	14252510	13869079	14236327	14194568	14252423

Std. errors in parentheses. Every specification includes firm, origin-product-year & destination-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B4: Further results and robustness for prices - from specification (5) in table 3

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
dta	-0.05**	-0.04*	-0.05**	-0.07***	-0.07**	-0.05**	-0.05**	-0.05**	-0.01	-0.04**	0.01	-0.05**	-0.03	-0.05**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
weighted_1_dta	-0.13***	-0.13***	-0.13***	-0.20***	0.01	-0.12***	-0.13***	-0.13***	-0.15***	-0.13***	-0.09**	-0.13***	-0.12***	-0.13***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.08)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
l_bilateral_t	0.24*	0.24*	0.23*	0.34***	0.08	0.54***	0.24*	0.24*	0.23*	0.26**	-0.36*	0.25*	0.21	0.24*
	(0.10)	(0.10)	(0.10)	(0.10)	(0.15)	(0.11)	(0.10)	(0.10)	(0.11)	(0.10)	(0.15)	(0.10)	(0.11)	(0.10)
l_weighted_t	0.86**	0.87**	0.86**	0.78**	3.21***	1.55***	0.86**	0.86**	0.52	0.84**	-0.08	0.92***	0.57*	0.86**
	(0.27)	(0.27)	(0.27)	(0.28)	(0.66)	(0.36)	(0.27)	(0.27)	(0.27)	(0.27)	(0.31)	(0.27)	(0.29)	(0.27)
N	14257049	14247998	14253377	13969484	1336393	13954525	14257049	14257049	13875828	14252893	13869590	14236738	14194962	14252820

Std.errors in parentheses. Every specification includes origin-dest'n, origin-product-year & dest'n-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B5: Further results and robustness for markups - from specification (6) in table 3

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
dta	-0.04***	-0.03***	-0.03***	-0.04***	-0.06***	-0.03***	-0.04***	-0.04***	-0.03***	-0.04***	-0.05***	-0.04***	-0.03***	-0.04***
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
weighted_1_dta	0.01	0.02	0.01	0.06**	0.11*	0.03	0.01	0.01	-0.00	0.01	-0.08***	0.01	0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
l_bilateral_t	-0.03	-0.03	-0.04	-0.05	-0.17*	0.08	-0.03	-0.03	0.01	-0.03	-0.03	-0.04	-0.09	-0.03
	(0.05)	(0.05)	(0.05)	(0.05)	(0.08)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.07)	(0.05)	(0.05)	(0.05)
l_weighted_t	0.25	0.27	0.22	0.47**	0.23	0.72**	0.25	0.25	0.42*	0.21	-0.39	0.27	0.16	0.27
	(0.17)	(0.18)	(0.18)	(0.18)	(0.48)	(0.23)	(0.17)	(0.17)	(0.18)	(0.17)	(0.22)	(0.18)	(0.19)	(0.18)
N	14238884	14229686	14235109	13948958	1311305	13935501	14238884	14238884	13858703	14234679	13850941	14218260	14176227	14234577

Std.errors in parentheses. Every specification includes origin-firm-product-year & destination-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

B.2 Robustness for table 4, Highly Differentiated Goods

Table B6: Further results: Trade Values for Highly Differentiated Goods - from specification (2) in table 4

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
dta	0.32***	0.32***	0.32***	0.21***	0.33***	0.28***	0.29***	0.32***	0.66***	0.32***	0.35***	0.32***	0.31***	0.32***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
weighted_1_dta	-0.67***	-0.67***	-0.67***	-1.06***	-4.26***	-0.73***	-0.60***	-0.67***	0.50***	-0.68***	-0.51***	-0.67***	-0.71***	-0.67***
	(0.05)	(0.05)	(0.05)	(0.06)	(0.14)	(0.05)	(0.06)	(0.05)	(0.07)	(0.05)	(0.06)	(0.05)	(0.06)	(0.05)
l_bilateral_t	-4.23***	-4.23***	-4.27***	-4.70***	-1.72***	-4.62***	-4.94***	-4.26***	-1.90***	-4.24***	-5.61***	-4.25***	-4.34***	-4.23***
	(0.13)	(0.13)	(0.13)	(0.13)	(0.19)	(0.13)	(0.14)	(0.13)	(0.17)	(0.13)	(0.17)	(0.13)	(0.13)	(0.13)
l_weighted_t	5.90***	5.94***	5.83***	5.97***	5.06***	5.57***	6.70***	5.96***	-0.88	5.96***	7.27***	5.92***	5.45***	5.91***
	(0.68)	(0.68)	(0.68)	(0.71)	(1.27)	(0.69)	(0.75)	(0.68)	(0.89)	(0.68)	(0.87)	(0.68)	(0.74)	(0.68)
N	5619517	5618170	5618229	5538239	599225	5569964	5572708	5614691	5275810	5619177	5478315	5616113	5608251	5619385

Std.errors in parentheses. Every specification includes origin-firm-product-year & destination-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B7: Further results and robustness for values - from specification (4) in table 4

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
dta	-0.07*	-0.07*	-0.07*	-0.10***	-0.11**	-0.08**	0.00	-0.08**	-0.01	-0.07**	-0.05	-0.07*	-0.07*	-0.07*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.05)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)
weighted_1_dta	-0.00	-0.00	-0.00	-0.30***	-2.27***	-0.02	0.07	-0.00	0.63***	-0.01	0.16*	-0.00	0.00	-0.00
	(0.06)	(0.06)	(0.06)	(0.06)	(0.15)	(0.06)	(0.06)	(0.06)	(0.08)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
l_bilateral_t	-1.92***	-1.91***	-1.92***	-2.31***	-0.73**	-2.06***	-1.82***	-1.91***	-1.48***	-1.93***	-2.43***	-1.91***	-2.05***	-1.91***
	(0.18)	(0.18)	(0.18)	(0.18)	(0.25)	(0.18)	(0.20)	(0.18)	(0.27)	(0.18)	(0.23)	(0.18)	(0.19)	(0.18)
l_weighted_t	4.94***	4.94***	4.93***	4.79***	7.84***	4.93***	5.84***	5.00***	-1.28	4.98***	6.51***	4.97***	4.02***	4.94***
	(0.68)	(0.68)	(0.68)	(0.71)	(1.23)	(0.69)	(0.76)	(0.69)	(0.96)	(0.68)	(0.86)	(0.68)	(0.74)	(0.68)
N	5619321	5618001	5618066	5538055	599014	5569780	5572528	5614524	5275618	5618993	5478151	5615945	5608068	5619203

Std. errors in parentheses. Every specification includes origin-dest'n, origin-firm-product-year & dest'n-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B8: Further results and robustness for markups - from specification (8) in table 4

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
dta	0.00	0.00	0.01	0.01	-0.03*	0.01	0.00	0.00	0.00	0.00	-0.02**	0.00	0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
weighted_1_dta	-0.02	-0.02	-0.01	0.02	-0.25	-0.01	-0.02	-0.02	-0.01	-0.02	-0.08*	-0.02	-0.01	-0.02
	(0.02)	(0.02)	(0.02)	(0.03)	(0.16)	(0.03)	(0.02)	(0.02)	(0.03)	(0.02)	(0.04)	(0.02)	(0.03)	(0.02)
l_bilateral_t	0.22***	0.22***	0.20***	0.20**	-0.16	0.35***	0.22***	0.22***	0.28***	0.24***	0.16	0.20***	0.23***	0.22***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.11)	(0.06)	(0.06)	(0.06)	(0.07)	(0.06)	(0.12)	(0.06)	(0.07)	(0.06)
l_weighted_t	1.44***	1.43***	1.39***	1.72***	-1.46	1.52***	1.44***	1.44***	1.78***	1.41***	0.73	1.39***	1.78***	1.44***
	(0.28)	(0.28)	(0.28)	(0.29)	(0.92)	(0.29)	(0.28)	(0.28)	(0.29)	(0.28)	(0.53)	(0.28)	(0.34)	(0.28)
N	5314689	5313399	5313439	5234243	325387	5266236	5314689	5314689	5223436	5314367	5178597	5311348	5304020	5314564

Std.errors in parentheses. Every specification includes origin-firm-product-year & dest'n-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

B.3 Robustness for table 6, Trade Values and Rules of Origin Provisions

Table B9: Further results: Rule of Origin Provisions and Trade Values - from specification (2) in table 6

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
prov_08_01	0.50***	0.49***	0.49***	0.53***	0.33***	0.50***	0.54***	0.50***	0.04	0.50***	0.59***	0.49***	0.51***	0.50***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
weighted_1_prov_08_01	-1.63***	-1.63***	-1.63***	-1.61***	-1.00***	-1.67***	-1.38***	-1.62***	0.68***	-1.63***	-2.05***	-1.65***	-1.71***	-1.63***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.11)	(0.06)	(0.07)	(0.06)	(0.11)	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)
dta	0.18***	0.18***	0.18***	0.09***	0.36***	0.15***	0.16***	0.18***	0.60***	0.18***	0.15***	0.19***	0.16***	0.18***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
weighted_1_dta	-0.03	-0.03	-0.02	-0.21***	-1.59***	-0.02	-0.03	-0.02	0.20***	-0.03	0.43***	-0.02	0.05	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)	(0.09)	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)
l_bilateral_t	-3.31***	-3.31***	-3.33***	-3.72***	-1.14***	-3.65***	-4.07***	-3.39***	-1.59***	-3.32***	-3.74***	-3.34***	-3.20***	-3.32***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.12)	(0.09)	(0.09)	(0.08)	(0.11)	(0.08)	(0.11)	(0.08)	(0.09)	(0.08)
l_weighted_t	4.67***	4.69***	4.64***	4.71***	8.39***	5.05***	5.77***	4.48***	0.78	4.65***	3.16***	4.64***	4.34***	4.70***
	(0.41)	(0.41)	(0.41)	(0.43)	(0.64)	(0.42)	(0.51)	(0.41)	(0.51)	(0.41)	(0.49)	(0.41)	(0.43)	(0.41)
N	15543005	15533520	15539169	15248925	2510435	15233843	15352584	15517132	14083678	15538642	15134772	15522018	15477329	15538593

Std. errors in parentheses. Every specification includes origin-firm-product-year & dest'n-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B10: Further results: Rule of Origin Provisions and Trade Values - from specification (3) in table 6

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
prov_08_01	0.03	0.03	0.03	0.03	0.04	0.01	0.15***	0.03	0.09*	0.03	-0.05	0.03	0.02	0.03
	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)
weighted_1_prov_08_01	-0.81***	-0.81***	-0.81***	-0.70***	-0.31**	-0.83***	-0.76***	-0.82***	0.90***	-0.81***	-1.23***	-0.82***	-0.88***	-0.81***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.11)	(0.06)	(0.07)	(0.06)	(0.12)	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)
dta	-0.04*	-0.04	-0.04*	-0.05*	-0.04	-0.04	-0.05*	-0.04	-0.01	-0.04*	-0.07**	-0.04	-0.03	-0.04
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
weighted_1_dta	-0.01	-0.01	-0.01	-0.19***	-0.85***	-0.00	-0.01	0.00	0.23***	-0.01	0.24***	-0.00	0.05	-0.00
	(0.04)	(0.04)	(0.04)	(0.04)	(0.09)	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)
l_bilateral_t	-1.25***	-1.24***	-1.26***	-1.43***	-0.47**	-1.49***	-1.31***	-1.31***	-0.80***	-1.27***	-1.35***	-1.26***	-1.38***	-1.25***
	(0.11)	(0.11)	(0.11)	(0.11)	(0.15)	(0.11)	(0.12)	(0.11)	(0.16)	(0.11)	(0.13)	(0.11)	(0.11)	(0.11)

l_weighted_t	3.79***	3.80***	3.76***	3.88***	7.84***	4.04***	3.68***	3.71***	0.25	3.78***	3.90***	3.74***	3.34***	3.79***
	(0.39)	(0.39)	(0.39)	(0.40)	(0.64)	(0.42)	(0.45)	(0.39)	(0.51)	(0.39)	(0.47)	(0.39)	(0.41)	(0.39)
N	15542843	15533393	15539029	15248769	2510267	15233681	15352430	15516988	14083510	15538493	15134629	15521874	15477173	15538460

Std. errors in parentheses. Every specification includes origin-dest'n, origin-firm-product-year & dest'n-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B11: Further results: ROO Provisions and Trade Values for Highly Differentiated Goods - from spec. (4) in table 6

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
prov_08_01	0.35***	0.35***	0.35***	0.41***	0.16***	0.37***	0.44***	0.34***	-0.35***	0.35***	0.47***	0.35***	0.36***	0.35***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.04)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
weighted_1_prov_08_01	-1.92***	-1.92***	-1.93***	-1.92***	-1.17***	-1.91***	-1.69***	-1.95***	1.15***	-1.91***	-2.15***	-1.93***	-1.99***	-1.92***
	(0.10)	(0.10)	(0.10)	(0.10)	(0.30)	(0.10)	(0.11)	(0.10)	(0.18)	(0.10)	(0.12)	(0.10)	(0.10)	(0.10)
dta	0.22***	0.22***	0.22***	0.06***	0.25***	0.17***	0.21***	0.22***	0.70***	0.22***	0.21***	0.22***	0.20***	0.22***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
weighted_1_dta	0.29***	0.29***	0.29***	0.10	-3.21***	0.24***	0.27***	0.30***	0.46***	0.28***	0.85***	0.29***	0.32***	0.29***
	(0.06)	(0.06)	(0.06)	(0.07)	(0.26)	(0.06)	(0.06)	(0.06)	(0.07)	(0.06)	(0.08)	(0.06)	(0.06)	(0.06)
l_bilateral_t	-3.86***	-3.86***	-3.90***	-4.31***	-1.73***	-4.20***	-4.28***	-3.90***	-1.98***	-3.87***	-4.67***	-3.88***	-3.91***	-3.86***
	(0.12)	(0.12)	(0.13)	(0.13)	(0.19)	(0.13)	(0.14)	(0.13)	(0.17)	(0.12)	(0.16)	(0.12)	(0.13)	(0.12)
l_weighted_t	3.69***	3.73***	3.62***	4.39***	7.26***	3.39***	4.24***	3.74***	-0.04	3.74***	3.56***	3.71***	2.37**	3.70***
	(0.67)	(0.67)	(0.67)	(0.69)	(1.33)	(0.68)	(0.74)	(0.67)	(0.91)	(0.67)	(0.85)	(0.67)	(0.72)	(0.67)
N	5619517	5618170	5618229	5538239	599225	5569964	5572708	5614691	5275810	5619177	5478315	5616113	5608251	5619385

Std.errors in parentheses. Every specification includes origin-firm-product-year & destination-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B12: Further results: Rule of Origin Provisions and Trade Values - from specification (6) in table 6

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
prov_08_02	0.30***	0.30***	0.30***	0.37***	0.25***	0.34***	0.30***	0.30***	0.17***	0.30***	0.26***	0.31***	0.28***	0.30***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
weighted_1_prov_08_02	1.20***	1.19***	1.19***	1.45***	1.75***	1.27***	0.98***	1.19***	-0.68***	1.19***	1.86***	1.23***	1.34***	1.19***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.11)	(0.06)	(0.07)	(0.06)	(0.09)	(0.06)	(0.08)	(0.06)	(0.06)	(0.06)
dta	0.27***	0.27***	0.27***	0.19***	0.44***	0.22***	0.20***	0.27***	0.56***	0.27***	0.29***	0.27***	0.27***	0.27***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)

weighted_1_dta	-1.37***	-1.37***	-1.37***	-1.76***	-2.89***	-1.43***	-1.18***	-1.37***	0.51***	-1.37***	-1.47***	-1.37***	-1.39***	-1.37***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.06)	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
l_bilateral_t	-3.44***	-3.43***	-3.46***	-3.77***	-0.60***	-3.75***	-4.43***	-3.52***	-1.40***	-3.46***	-4.72***	-3.47***	-3.45***	-3.45***
	(0.08)	(0.08)	(0.08)	(0.09)	(0.12)	(0.09)	(0.10)	(0.08)	(0.11)	(0.09)	(0.11)	(0.09)	(0.09)	(0.08)
l_weighted_t	6.12***	6.13***	6.08***	6.02***	9.06***	6.94***	7.85***	5.93***	-0.38	6.11***	5.39***	6.15***	6.14***	6.16***
	(0.45)	(0.45)	(0.45)	(0.46)	(0.64)	(0.44)	(0.57)	(0.45)	(0.51)	(0.45)	(0.56)	(0.45)	(0.47)	(0.45)
N	15543005	15533520	15539169	15248925	2510435	15233843	15352584	15517132	14083678	15538642	15134772	15522018	15477329	15538593

Std. errors in parentheses. Every specification includes origin-firm-product-year & destination-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B13: Further results: Rule of Origin Provisions and Trade Values - from specification (7) in table 6

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
prov_08_02	-0.06*	-0.06*	-0.06*	-0.06*	0.01	-0.05	-0.15***	-0.06*	-0.13**	-0.06*	-0.05	-0.06*	-0.03	-0.06*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)
weighted_1_prov_08_02	-0.21***	-0.21***	-0.21***	-0.15*	0.24*	-0.21**	-0.48***	-0.22***	-1.47***	-0.21***	0.38***	-0.19**	-0.05	-0.21***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.11)	(0.06)	(0.07)	(0.06)	(0.09)	(0.06)	(0.08)	(0.06)	(0.06)	(0.06)
dta	-0.02	-0.02	-0.02	-0.03	-0.01	-0.03	0.04	-0.02	0.01	-0.02	-0.08**	-0.02	-0.02	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
weighted_1_dta	-0.31***	-0.31***	-0.31***	-0.49***	-1.12***	-0.32***	-0.13**	-0.30***	0.77***	-0.31***	-0.45***	-0.31***	-0.33***	-0.31***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.07)	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
l_bilateral_t	-1.26***	-1.25***	-1.27***	-1.45***	-0.48**	-1.50***	-1.36***	-1.32***	-0.91***	-1.28***	-1.33***	-1.27***	-1.37***	-1.26***
	(0.11)	(0.11)	(0.11)	(0.11)	(0.15)	(0.11)	(0.12)	(0.11)	(0.16)	(0.11)	(0.13)	(0.11)	(0.11)	(0.11)
l_weighted_t	3.49***	3.50***	3.45***	3.55***	7.75***	3.74***	3.32***	3.40***	-1.44**	3.48***	4.32***	3.47***	3.29***	3.48***
	(0.39)	(0.40)	(0.40)	(0.41)	(0.64)	(0.43)	(0.45)	(0.40)	(0.52)	(0.40)	(0.48)	(0.40)	(0.41)	(0.39)
N	15542843	15533393	15539029	15248769	2510267	15233681	15352430	15516988	14083510	15538493	15134629	15521874	15477173	15538460

Std. errors in parentheses. Every specification includes origin-dest'n, origin-firm-product-year & dest'n-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B14: Further results: ROO Provisions and Trade Values for Highly Differentiated Goods - from spec. (8) in table 6

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
prov_08_02	0.22***	0.22***	0.22***	0.31***	0.19***	0.24***	0.17***	0.21***	0.21***	0.22***	0.14***	0.22***	0.21***	0.22***

	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.02)	(0.03)	(0.02)	(0.04)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)
weighted_1_prov_08_02	0.77***	0.77***	0.77***	1.08***	2.28***	0.79***	0.62***	0.76***	-0.47***	0.76***	1.01***	0.77***	0.89***	0.77***
	(0.10)	(0.10)	(0.10)	(0.11)	(0.29)	(0.10)	(0.11)	(0.10)	(0.13)	(0.10)	(0.13)	(0.10)	(0.11)	(0.10)
dta	0.27***	0.27***	0.27***	0.14***	0.28***	0.22***	0.25***	0.27***	0.59***	0.27***	0.33***	0.27***	0.27***	0.27***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
weighted_1_dta	-0.82***	-0.82***	-0.82***	-1.30***	-4.72***	-0.89***	-0.73***	-0.82***	0.67***	-0.82***	-0.65***	-0.82***	-0.86***	-0.82***
	(0.06)	(0.06)	(0.06)	(0.07)	(0.16)	(0.06)	(0.06)	(0.06)	(0.08)	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)
l_bilateral_t	-4.08***	-4.08***	-4.12***	-4.49***	-1.60***	-4.42***	-4.80***	-4.11***	-1.72***	-4.10***	-5.56***	-4.10***	-4.20***	-4.08***
	(0.13)	(0.13)	(0.13)	(0.13)	(0.19)	(0.14)	(0.14)	(0.13)	(0.18)	(0.13)	(0.17)	(0.13)	(0.14)	(0.13)
l_weighted_t	6.55***	6.58***	6.48***	6.85***	8.10***	6.28***	7.29***	6.62***	-1.89*	6.60***	7.85***	6.57***	6.09***	6.55***
	(0.69)	(0.69)	(0.69)	(0.72)	(1.32)	(0.70)	(0.76)	(0.69)	(0.91)	(0.69)	(0.87)	(0.69)	(0.74)	(0.69)
N	5619517	5618170	5618229	5538239	599225	5569964	5572708	5614691	5275810	5619177	5478315	5616113	5608251	5619385

Std.errors in parentheses. Every specification includes origin-firm-product-year & dest'n-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

B.4 Standard errors for specifications in table 8, Prices and ROO provisions

	(1) ALL	(2) CCHS	(3) -CHN	(4) -MEX	(5) ALL	(6) CCHS	(7) -CHN	(8) -MEX
prov_08_01	0.04**	0.08***	0.09***	0.03				
	(0.01)	(0.02)	(0.02)	(0.02)				
weighted_1_prov_08_01	-0.14**	-0.16	0.24*	-0.46***				
	(0.05)	(0.08)	(0.11)	(0.06)				
dta	-0.03***	0.03***	-0.07***	-0.01*	-0.02***	0.04***	-0.04***	-0.03***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
weighted_1_dta	-0.01	-0.02	0.03	-0.03	-0.00	0.00	0.10	-0.03
	(0.02)	(0.02)	(0.06)	(0.02)	(0.02)	(0.03)	(0.08)	(0.02)
l_bilateral_t	0.01	0.34***	-0.18*	0.07	-0.00	0.32***	-0.29***	0.13*
	(0.05)	(0.07)	(0.09)	(0.05)	(0.05)	(0.07)	(0.09)	(0.05)
l_weighted_1_t	0.38	1.50***	0.69	0.25	0.37	1.46***	0.69	0.54**
	(0.20)	(0.31)	(0.53)	(0.20)	(0.20)	(0.31)	(0.54)	(0.20)
prov_08_02					-0.01	-0.00	-0.06***	0.04***
					(0.01)	(0.01)	(0.01)	(0.01)
weighted_1_prov_08_02					-0.06	-0.08	-0.09	-0.01
					(0.03)	(0.05)	(0.10)	(0.04)
N	14256684	5318669	1335562	13875515	14256684	5318669	1335562	13875515

Std.errors in parentheses. Every specification includes firm, origin-product-year & dest'n-product-year fixed effects. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

B.5 Robustness for table 9, Markups and Rules of Origin Provisions

Table B16: Further results: Rules of Origin Provisions and Markups - from specification (1) in table 9

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
prov_08_01	0.06***	0.06***	0.06***	0.07***	0.11***	0.07***	0.06***	0.06***	0.05*	0.06***	-0.07**	0.06***	0.07***	0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
weighted_1_prov_08_01	-0.12*	-0.12*	-0.12*	-0.07	0.25*	-0.11*	-0.12*	-0.12*	-0.42***	-0.12*	-0.19*	-0.11*	-0.14**	-0.12*
	(0.05)	(0.05)	(0.05)	(0.06)	(0.11)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.08)	(0.05)	(0.05)	(0.05)
dta	-0.04***	-0.04***	-0.04***	-0.05***	-0.08***	-0.03***	-0.04***	-0.04***	-0.03***	-0.04***	-0.05***	-0.04***	-0.03***	-0.04***
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
weighted_1_dta	0.03	0.03	0.03	0.07***	0.06	0.04*	0.03	0.03	0.01	0.03	-0.07**	0.03	0.03	0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.05)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
l_bilateral_t	-0.02	-0.01	-0.03	-0.05	-0.13	0.10	-0.02	-0.02	0.01	-0.02	-0.05	-0.02	-0.07	-0.02
	(0.05)	(0.05)	(0.05)	(0.05)	(0.08)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.07)	(0.05)	(0.05)	(0.05)
l_weighted_t	0.20	0.21	0.17	0.46*	0.14	0.64**	0.20	0.20	0.15	0.16	-0.44*	0.22	0.08	0.21
	(0.18)	(0.18)	(0.18)	(0.18)	(0.47)	(0.23)	(0.18)	(0.18)	(0.18)	(0.18)	(0.22)	(0.18)	(0.20)	(0.18)
N	14238884	14229686	14235109	13948958	1311305	13935501	14238884	14238884	13858703	14234679	13850941	14218260	14176227	14234577

Std. errors in parentheses. Every specification includes origin-firm-product-year & destination-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B17: Further results: Rules of Origin Provisions and Markups for Highly Differentiated Goods - from specification (2) in table 9

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
prov_08_01	0.08***	0.08***	0.07***	0.07***	0.10***	0.09***	0.08***	0.08***	0.08**	0.08***	-0.03	0.08***	0.09***	0.08***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.04)	(0.02)	(0.02)	(0.02)
weighted_1_prov_08_01	-0.13	-0.12	-0.14	-0.09	0.14	-0.15	-0.13	-0.13	-0.16	-0.13	-0.06	-0.14	-0.16	-0.13
	(0.08)	(0.08)	(0.08)	(0.09)	(0.25)	(0.09)	(0.08)	(0.08)	(0.09)	(0.08)	(0.12)	(0.08)	(0.09)	(0.08)
dta	-0.00	-0.00	0.00	0.00	-0.05***	0.01	-0.00	-0.00	0.00	-0.00	-0.02*	-0.00	0.00	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
weighted_1_dta	-0.02	-0.02	-0.01	0.02	-0.28	-0.01	-0.02	-0.02	-0.01	-0.02	-0.07*	-0.02	-0.00	-0.02
	(0.02)	(0.02)	(0.02)	(0.03)	(0.16)	(0.03)	(0.02)	(0.02)	(0.03)	(0.02)	(0.04)	(0.02)	(0.03)	(0.02)

l_bilateral_t	0.24***	0.25***	0.23***	0.21**	-0.08	0.36***	0.24***	0.24***	0.30***	0.27***	0.15	0.23***	0.27***	0.25***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.11)	(0.06)	(0.06)	(0.06)	(0.07)	(0.06)	(0.12)	(0.06)	(0.07)	(0.06)
l_weighted_t	1.37***	1.37***	1.31***	1.69***	-1.29	1.42***	1.37***	1.37***	1.68***	1.34***	0.69	1.31***	1.65***	1.37***
	(0.29)	(0.29)	(0.29)	(0.30)	(0.87)	(0.29)	(0.29)	(0.29)	(0.29)	(0.29)	(0.53)	(0.29)	(0.35)	(0.29)
N	5314689	5313399	5313439	5234243	325387	5266236	5314689	5314689	5223436	5314367	5178597	5311348	5304020	5314564

Std.errors in parentheses. Every specification includes origin-firm-product-year & destination-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B18: Further results: Rules of Origin Provisions and Markups - from specification (5) in table 9

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
prov_08_02	-0.01	-0.01	-0.00	-0.01	-0.06***	-0.01	-0.01	-0.01	0.03**	-0.01	0.01	-0.01	0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
weighted_1_prov_08_02	-0.06	-0.06*	-0.06	-0.14***	-0.12	-0.08*	-0.06	-0.06	-0.00	-0.06	0.06	-0.08*	-0.04	-0.06*
	(0.03)	(0.03)	(0.03)	(0.04)	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)
dta	-0.03***	-0.03***	-0.03***	-0.03***	-0.04***	-0.03***	-0.03***	-0.03***	-0.04***	-0.03***	-0.06***	-0.03***	-0.03***	-0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
weighted_1_dta	0.03	0.03	0.03	0.11***	0.14	0.05*	0.03	0.03	0.00	0.03	-0.10***	0.04	0.03	0.03
	(0.02)	(0.02)	(0.02)	(0.03)	(0.08)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
l_bilateral_t	-0.04	-0.04	-0.05	-0.06	-0.24**	0.06	-0.04	-0.04	0.05	-0.04	-0.03	-0.06	-0.07	-0.04
	(0.05)	(0.05)	(0.05)	(0.05)	(0.08)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.07)	(0.05)	(0.05)	(0.05)
l_weighted_t	0.18	0.19	0.15	0.33	0.06	0.59*	0.18	0.18	0.42*	0.14	-0.34	0.17	0.12	0.19
	(0.18)	(0.18)	(0.18)	(0.18)	(0.48)	(0.23)	(0.18)	(0.18)	(0.18)	(0.18)	(0.22)	(0.18)	(0.19)	(0.18)
N	14238884	14229686	14235109	13948958	1311305	13935501	14238884	14238884	13858703	14234679	13850941	14218260	14176227	14234577

Std. errors in parentheses. Every specification includes origin-firm-product-year & destination-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table B19: Further results: Rules of Origin Provisions and Markups for Highly Differentiated Goods - from specification (6) in table 9

	(1) ALL	(2) -ALB	(3) -BFA	(4) -BGR	(5) -CHN	(6) -EGY	(7) -GTM	(8) -JOR	(9) -MEX	(10) -MWI	(11) -PER	(12) -SEN	(13) -URY	(14) -YEM
prov_08_02	-0.01	-0.01	-0.01	-0.03*	-0.09***	0.02	-0.01	-0.01	0.01	-0.01	-0.03	-0.01	-0.00	-0.01

	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
weighted_1_prov_08_02	-0.09*	-0.09*	-0.09	-0.14**	-0.14	-0.07	-0.09*	-0.09*	-0.06	-0.10*	-0.04	-0.10*	-0.09	-0.09*
	(0.05)	(0.05)	(0.05)	(0.05)	(0.24)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.07)	(0.05)	(0.05)	(0.05)
dta	0.00	0.00	0.01	0.02	-0.00	0.00	0.00	0.00	-0.00	0.00	-0.02*	0.00	0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
weighted_1_dta	0.01	0.01	0.01	0.07	-0.26	0.01	0.01	0.01	0.01	0.01	-0.07	0.01	0.01	0.01
	(0.03)	(0.03)	(0.03)	(0.04)	(0.22)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)
l_bilateral_t	0.21***	0.21***	0.20**	0.18**	-0.20	0.37***	0.21***	0.21***	0.29***	0.23***	0.14	0.19**	0.23**	0.21***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.11)	(0.06)	(0.06)	(0.06)	(0.07)	(0.06)	(0.12)	(0.06)	(0.07)	(0.06)
l_weighted_t	1.30***	1.30***	1.26***	1.56***	-1.58	1.39***	1.30***	1.30***	1.66***	1.27***	0.72	1.25***	1.65***	1.30***
	(0.29)	(0.29)	(0.29)	(0.30)	(0.86)	(0.30)	(0.29)	(0.29)	(0.30)	(0.29)	(0.54)	(0.29)	(0.35)	(0.29)
N	5314689	5313399	5313439	5234243	325387	5266236	5314689	5314689	5223436	5314367	5178597	5311348	5304020	5314564

Std.errors in parentheses. Every specification includes origin-firm-product-year & destination-product-year fixed effects.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

B.6 Standard errors for table 10, Trade Values and MR

	(1) ALL	(2) CCHS	(3) -CHN	(4) -MEX	(5) ALL	(6) CCHS	(7) -CHN	(8) -MEX
prov_11_04	0.50***	0.76***	0.68***	0.10***				
	(0.02)	(0.03)	(0.03)	(0.02)				
weighted_1_prov_11_04	3.88***	3.42***	8.57***	0.84***				
	(0.06)	(0.10)	(0.41)	(0.08)				
dta	0.28***	0.22***	0.47***	0.58***	0.28***	0.22***	0.47***	0.58***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
weighted_1_dta	-1.96***	-1.70***	-2.52***	-0.08	-1.98***	-1.73***	-2.53***	-0.08
	(0.03)	(0.06)	(0.05)	(0.06)	(0.03)	(0.06)	(0.05)	(0.06)
l_bilateral_t	-3.81***	-4.40***	-0.97***	-1.71***	-3.80***	-4.39***	-0.97***	-1.71***
	(0.08)	(0.13)	(0.12)	(0.11)	(0.08)	(0.13)	(0.12)	(0.11)
l_weighted_1_t	-0.05	-0.01	5.47***	-1.21*	-0.11	-0.09	5.45***	-1.20*
	(0.40)	(0.70)	(0.62)	(0.52)	(0.40)	(0.70)	(0.62)	(0.52)
prov_11_16					0.50***	0.76***	0.68***	0.10***
					(0.02)	(0.03)	(0.03)	(0.02)
weighted_1_prov_11_16					3.93***	3.48***	8.56***	0.84***
					(0.06)	(0.10)	(0.40)	(0.08)
N	15543005	5619517	2510435	14083678	15543005	5619517	2510435	14083678

Std. errors in parentheses. Every specification includes origin-firm-product-year & destination-product-year fixed effects. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

B.7 Standard errors for table 12, Prices and MR

	(1) ALL	(2) CCHS	(3) -CHN	(4) -MEX	(5) ALL	(6) CCHS	(7) -CHN	(8) -MEX
prov_11_04	0.03***	0.02	-0.04*	0.03***				
	(0.01)	(0.01)	(0.02)	(0.01)				
weighted_1_prov_11_04	0.14***	0.17***	-0.33*	0.20***				
	(0.03)	(0.05)	(0.16)	(0.03)				
dta	-0.04***	0.03***	-0.05***	-0.03***	-0.04***	0.03***	-0.05***	-0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
weighted_1_dta	-0.08***	-0.11**	0.11	-0.14***	-0.08***	-0.11**	0.11	-0.14***
	(0.02)	(0.04)	(0.06)	(0.02)	(0.02)	(0.04)	(0.06)	(0.02)
l_bilateral_t	-0.04	0.30***	-0.20*	0.04	-0.04	0.30***	-0.20*	0.04
	(0.05)	(0.07)	(0.09)	(0.05)	(0.05)	(0.07)	(0.09)	(0.05)
l_weighted_1_t	0.17	1.16***	0.93	0.12	0.18	1.17***	0.93	0.13
	(0.21)	(0.33)	(0.54)	(0.20)	(0.21)	(0.33)	(0.54)	(0.20)
prov_11_16					0.03***	0.02	-0.04*	0.03***
					(0.01)	(0.01)	(0.02)	(0.01)
weighted_1_prov_11_16					0.13***	0.17***	-0.34*	0.19***
					(0.03)	(0.05)	(0.16)	(0.03)
N	14256684	5318669	1335562	13875515	14256684	5318669	1335562	13875515

Std.errors in parentheses. Every specification includes firm, origin-product-year & destination-product-year fixed effects. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

B.8 Standard errors for table 13, Markups and MR

	(1) ALL	(2) CCHS	(3) -CHN	(4) -MEX	(5) ALL	(6) CCHS	(7) -CHN	(8) -MEX
prov_11_04	0.04***	0.02	-0.01	0.03***				
	(0.01)	(0.01)	(0.02)	(0.01)				
weighted_1_prov_11_04	0.18***	0.22***	-0.30*	0.23***				
	(0.03)	(0.05)	(0.14)	(0.03)				
dta	-0.05***	-0.00	-0.06***	-0.04***	-0.05***	-0.00	-0.06***	-0.04***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
weighted_1_dta	-0.06**	-0.13***	0.13*	-0.11***	-0.06**	-0.13***	0.13*	-0.11***
	(0.02)	(0.03)	(0.06)	(0.02)	(0.02)	(0.04)	(0.06)	(0.02)
l_bilateral_t	-0.08	0.19**	-0.16	-0.03	-0.08	0.20**	-0.16	-0.03
	(0.05)	(0.06)	(0.08)	(0.05)	(0.05)	(0.06)	(0.08)	(0.05)
l_weighted_1_t	-0.09	0.88**	0.33	-0.07	-0.08	0.89**	0.33	-0.06
	(0.18)	(0.31)	(0.49)	(0.18)	(0.18)	(0.31)	(0.49)	(0.18)
prov_11_16					0.04***	0.02	-0.01	0.03***
					(0.01)	(0.01)	(0.02)	(0.01)
weighted_1_prov_11_16					0.17***	0.22***	-0.31*	0.22***
					(0.03)	(0.05)	(0.14)	(0.03)
N	14238884	5314689	1311305	13858703	14238884	5314689	1311305	13858703

Std.errors in parentheses. Every specification includes origin-firm-product year & destination-product-year fixed effects. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$