Exempted sectors in free trade agreements

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Abstract. Almost all participants in free trade agreements (FTAs) exclude at least a few products or sectors from complete tariff removal on the exports of their FTA partners. The positive tariffs that remain within an FTA are often the highest tariffs that the countries apply on an MFN basis. It seems plausible that such exclusions may be chosen because the domestic producers of these products are viewed as especially vulnerable to competition from imports from the partner country. In brief, they are especially "sensitive sectors." We develop this idea theoretically and then test it empirically on data from 37 countries in 240 importer–exporter pairs within FTAs. We find support for the sensitive-sector hypothesis only in the high-income countries. We find that low-income countries, in contrast, exempt sectors where bilateral tariff removal would be more likely trade-diverting and therefore harmful. Our explanation for this, supported empirically, is not that they are following the advice of trade economists, but rather that they are avoiding loss of tariff revenue and may also perhaps be influenced by the greater bargaining power of richer and/or larger partners in their FTAs.

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1. Introduction

Almost all participants in free trade agreements (FTAs) exclude at least a few products or sectors from complete tariff removal on the exports of their FTA partners. The positive tariffs that remain within an FTA are often the highest tariffs that the countries apply on an MFN basis. This paper documents the use of exemptions across a large number of FTAs and attempts to explain how these exempted sectors are selected.

One explanation that seems plausible is that such exclusions are chosen because the domestic producers of these products are viewed as especially vulnerable to competition with imports from the partner country. This is precisely the explanation provided by Grossman and Helpman (1995), where that vulnerability appears as a loss of profits by firms that exert political influence. In brief, they are especially "sensitive sectors." We find evidence for this explanation, but only in a subset of countries, primarily the most developed countries.

To the extent that exempted sectors are sensitive, their exclusion from tariff reduction eliminates products for which the FTA would otherwise have been "trade-creating," in the terminology of Viner (1950). Therefore this exemption of sensitive sectors reduces the likelihood that the FTA will be beneficial in terms of overall welfare. Grossman and Helpman (1995) make this point formally, noting that the very exemptions that can make FTAs more viable politically are also likely to reduce aggregate social welfare by primarily increasing trade diversion rather than trade creation. However, since we find evidence for exempted sectors being sensitive only in developed countries, other explanations for their selection must be sought.

Additional explanations include the following. Countries may exclude sectors out of concern for lost tariff revenue, especially if the benefits from including these sectors would be small. While there seems to be no systematic evidence on how common it is for countries to consider tariff revenue loss in selecting excluded products, Fontagné et al. (2011) note that excluding products for this reason is one of the two approaches included in the guidelines of the EU's Directorate-General for Trade. In addition to revenue

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considerations, countries may also succumb to pressure from their FTA partners *not* to exclude sensitive sectors that they would otherwise exempt, based on the interest of those partners if they are large and powerful, leaving sectors to be excluded only if they are of little interest to the partner country. We find some evidence consistent with both of these explanations.

Using a simple partial equilibrium theoretical model of an FTA, we first examine how these several motivations for exempting sectors play out in the model, and how they relate to the effects that the FTA will have on welfare as captured by Viner's concepts of trade creation and trade diversion. This analysis also motivates a simple measure of an FTA's potential for trade diversion relative to trade creation: the share of third-country trade in a given product. Using this measure, we perform an empirical analysis of the available data on FTAs and their exempted sectors. For this analysis, we use a global tariff database that exhaustively takes FTAs into account.

There are relatively few empirical studies of the determinants of exemptions in FTAs. Related to our work, Ollareaga and Soloaga (1998) and Gawande et al. (2002) find evidence from Mercosur that deviations from internal free trade are more likely in sectors with greater potential for trade creation. Compared to this existing work, we study a much broader range of countries and FTAs and are therefore able to highlight the considerable global heterogeneity in the reasons for FTA exemptions. We are able to do this both because of the comprehensive global tariff database we employ and because the measure of trade diversion relative to trade creation that we derive can be computed using only trade data that are readily available for most countries.

2. Examples

Our data indicate that exempting products from tariff removal in FTAs is very common, perhaps surprisingly so. An example that became contentious in recent discussions, though it preceded the data that we use here, was the exemption of the dairy sector from Canada's liberalization commitments under the North American Free Trade Agreement. Though not widely mentioned at the time, NAFTA allowed Canada to keep its "supply management system" for dairy, which limited imports to a small quota with tariffs

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ranging from 200% to 300% on imports above that quota. The motivation for this exemption was understood: to protect dairy farmers, especially in Quebec, from competition with lower cost US suppliers. Removal of this exemption was sought by the US in its renegotiation of NAFTA, but the new United States–Mexico–Canada Agreement continues it, albeit with a somewhat larger quota.[1]

As we discuss in greater detail later in the paper, our data contain a large number of examples of such exemptions at the product level. A few notable ones include:

- US–Australia FTA (2005): In 2010, Australia had positive tariffs on HS6 products 870324 (Vehicles; with only spark-ignition internal combustion reciprocating piston engine, cylinder capacity over 3000cc) and 611020 (Jerseys, pullovers, cardigans, waistcoats and similar articles; of cotton, knitted or crocheted) from the US, which accounted for 4.3% and 2.1% of US exports to Australia, respectively, prior to the agreement. The tariff rates were about 7.3% and 15.5% vs. the MFN tariffs of 14% and 17.5%.
- US–Jordan FTA (2001): In 2010, the US had a positive tariff on HS6 product 240310 (Smoking tobacco, whether or not containing tobacco substitutes in any proportion), which accounted for 2.7% of Jordanian exports to the US prior to the agreement. The tariff rate on Jordan was the MFN rate of about 120%.
- India–Sri Lanka FTA (2001): In 2010, Sri Lanka had a positive tariff on HS6 product 090411 (Spices; pepper (of the genus piper), neither crushed nor ground), which accounted for about 18% of Indian exports to Sri Lanka prior to the agreement. The tariff rate on India was the MFN rate of about 30%.

3. Theory

[1] See Noll and Litan (2018).

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Consider a partial equilibrium model of trade and tariffs among three countries, A, B and C, with country A importing from the other two.[2] With linear supplies and demands, the model is

$$M^A = b^A(a^A - p^A) \tag{1}$$

$$X^i = b^i(p^A - t^i - a^i), \qquad i = B,C \tag{2}$$

$$M^A = X^B + X^C, \tag{3}$$

where $M^A(X^i)$ is the imports (exports) of country A (i), $b^i(a^i)$ are slopes (intercepts, hence autarky prices) of trade demands and supplies, p^A is the price in country A and t^i , $i = B,C$ is the specific tariff levied by country A on country i. We consider only equilibria where a^A is sufficiently higher than a^B and a^C so that both B and C export positive quantities to A even in the presence of the tariffs.

Suppose that country A initially levies an MFN tariff, t, on both B and C, then forms an FTA with only B so that its tariff on B is eliminated. In Deardorff and Sharma (2019), we solve a slightly more general model of which this is a special case. From the solution there (equation (24)), we get the change in price in country A due to the FTA as

$$\Delta p^A = -\frac{b^B t}{\beta}, \tag{4}$$

where $\beta = b^A + b^B + b^C$.

Note that this result, and those below that follow from it, depends on the assumption above that both countries B and C export positive quantities to country A in both equilibria.[3]

It is the price change in (3) that primarily determines how much the FTA disrupts the domestic industry producing this product in country A. This depends

[2] Our model therefore does not allow for the possibility of what Grossman and Helpman (1995), building on Richardson (1992), call "enhanced protection." In that, FTA partners that both import and produce the good find one of them increasing its imports from outside while exporting to its FTA partner.

[3] While this model assumes that the importing country faces an upward sloping foreign export supply curve and is therefore "large" in the traditional sense, we think of the upward sloping export supply more broadly as a way of capturing factors that are not explicitly in the model, such as Armington-type product differentiation, imperfect competition or exporter rents due to firm heterogeneity (Sharma 2018).

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mostly on the size of the tariff, but also on b^i/β, which under additional assumptions laid out in Deardorff and Sharma (2019) reflects country *i*'s size compared to the world economy.

3.1 Trade creation and diversion

In Deardorff and Sharma (2019), we also solve the model for changes in quantities traded and thus trade creation and trade diversion as follows:

$$TC = \Delta M^A = \frac{b^A b^B t}{\beta} = -\, b^A \Delta p^A \tag{5}$$

$$TD = -\Delta X^C = \frac{b^C b^B t}{\beta} = -\, b^C \Delta p^A. \tag{6}$$

Thus, the beneficial effect of the FTA, TC since $\Delta p^A < 0$, is directly related to the price change that disrupts the competing domestic industry. This is because the gain from an FTA, like any comparative advantage-based gain from trade, arises from replacing domestic production with lower-cost imports. Thus, the more that a country stands to gain in a sector from an FTA, the more those working in that sector will resist the FTA and request that they be exempted from its tariff reductions. Likewise, the harmful aggregate effect of the FTA in this industry also depends on its price change, but here it is scaled by b^C, which reflects the size of the economy outside of the FTA. Together these also allow us to compare trade creation and trade diversion:

$$\frac{TC}{TD} = \frac{b^A}{b^C}. \tag{7}$$

It is *not* the case that TC and TD directly measure the associated welfare effects, and therefore we cannot infer the net welfare effect of an FTA in a sector from whether $TC/TD > 1$. However, the valid message is that the country is more likely to gain from the FTA in the sector the higher is b^A (and thus the larger is country A) and the smaller is b^C (and thus the smaller is the rest-of-world outside the FTA).

3.2. Domestic markets and injury

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Letting $S^A = s^A(p^A - c^A)$ be the domestic supply function in country A, the change in producer surplus is

$$\Delta PS^A = S_0^A \Delta p^A + \frac{s^A}{2}(\Delta p^A)^2. \quad (8)$$

Using (5) this becomes

$$\Delta PS^A = -S_0^A \frac{TC}{b^A} + \frac{s^A}{2}\left(\frac{TC}{b^A}\right)^2 < 0, \quad (9)$$

where the sign follows from keeping supply non-negative.[4] As expected, holding S_0^A fixed, the loss of producer surplus increases with increasing trade creation:

$$\frac{d\Delta PS^A}{dTC} = -\frac{S_0^A}{b^A} + 2\frac{s^A TC}{2\, b^{A2}} = -\frac{S_0^A}{b^A} - \frac{s^A \Delta p^A}{b^A} = -\frac{S_1^A}{b^A} < 0. \quad (10)$$

3.3 Tariff revenue

The change in country A's tariff revenue includes both the reduced revenue from reduced imports from country C and the complete loss of the original tariff revenue from partner country B. This is

$$\Delta R^A = t\Delta X^C - tX_0^B = -t(TD + X_0^B). \quad (11)$$

Thus, country A stands to lose all of the tariff that it initially collects on imports from country B, plus the tariff rate times the quantity of trade diversion. For any given values of initial trade, the loss of tariff revenue increases with trade diversion.

3.4 Importing country's welfare

Private sector welfare is the sum of consumer and producer surplus. Their net can be inferred from a country's import demand or export supply curve, because the change in net surplus is the area to the left of these curves between prices, positive

[4] An equivalent version of (9) is $\Delta PS^A = -S_1^A\left(\frac{TC}{b^A}\right) - \left(\frac{s^A}{2}\right)\left(\frac{TC}{b^A}\right)^2$, which is clearly negative for $S_1^A \geq 0$ but which varies with S_1^A and thus with the size of the tariff.

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for a price increase to exporters and negative to importers. In Deardorff and Sharma (2019), we derive this as

$$\Delta NS^A = \left(\frac{M_0^A}{b^A} + \frac{b^B t}{2\beta}\right) TC. \quad (12)$$

Combining this with the change in government revenue from (11), we have the change in total welfare of country A:

$$\Delta W^A = \left(\frac{M_0^A}{b^A} + \frac{b^B t}{2\beta}\right) TC - tTD - tX_0^B. \quad (13)$$

That is, the FTA has the following effects on total welfare of importing country A:

- A gain in net private sector surplus due to trade creation,
- A loss of tariff revenue on imports from the outside country due to trade diversion and
- The complete loss of the tariff revenue it was getting on imports from the partner country.

On this basis, one might hope that countries would select products to exempt from tariff cuts if they would be more likely to cause trade diversion than trade creation, since the former is harmful and the latter beneficial in terms of aggregate welfare. We do not expect aggregate welfare to motivate countries, however, since if it did they would opt for multilateral free trade, not FTAs.

3.5 Exporting country's welfare

In addition to Country A's interests, exemptions are also likely to reflect country B's interests as an exporter. In Deardorff and Sharma (2019), we derive this as

$$\Delta W^B = \Delta NS^B = \left[X_0^B + \frac{1}{2}(TC + TD)\right]\left(1 - \frac{b^B}{\beta}\right) t. \quad (14)$$

We see from this that B's increase in welfare from an FTA would depend on the increase in its exports but not on whether the increased exports are due to trade creation or trade diversion. Hence, to the extent that B can influence A's choice of

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FTA exemptions, it should push to open up sectors where trade would increase substantially, but it should not be concerned about trade creation vs. trade diversion per se.

However, as we elaborate in section 7, there may be a more indirect reason why the extent of trade creation vs. diversion may matter for the exporting country. As we show in section 4, trade creation relative to trade diversion is greater when B accounts for a larger share of A's imports of a good. In practice, we might expect that industries in B that already account for a substantial fraction of A's imports would be especially involved in FTA negotiations between the two countries, and these industries would push for greater tariff reductions in A. Hence, we might expect B to push A to open up trade-creating sectors, not because of an intrinsic preference for trade creation vs. diversion but simply because these are the sectors where B's organized interests are more likely to be active in the context of an FTA with A.

4. Exempted sectors

From (10) and (11), we see two alternative rationales for exempting sectors from the tariff cuts of an FTA. If the country is most concerned about the disruption that will be caused to domestic industry, then it will exempt those sectors where the effects of the FTA would be most trade-creating if they were not exempted. These are the sectors we have described as "sensitive sectors." Such concern about industry disruption could be based on concern for the well-being of disrupted workers and firms, or it may reflect their political influence as in Grossman and Helpman (1995).

Alternatively, countries may be more concerned about the role of tariff revenue in the government budget. If so, (11) suggests that they will seek to exempt those sectors where inclusion in the FTA would be more likely to divert trade than to create it. In addition, they will avoid exempting sectors where tariff revenue from the partner country is initially high, because of a high tariff rate and/or a high level of exports from that country.

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In our empirical analysis below, we use a simple predictor of trade creation and trade diversion, in addition to other variables, to sort out how these motives appear to have influenced the selection of exempted sectors in FTAs.

4.1 Predictor of trade creation vs. trade diversion

To obtain a simple and intuitive predictor of the extent of trade creation vs. diversion for use in our empirical analysis, we first define two elasticities. Let η^A be (minus) the elasticity of demand for imports by country A and ε^C be the elasticity of supply of exports by country C, then

$$\eta^A = -\frac{dM^A p^A}{dp^A M^A} = b^A \frac{p^A}{b^A(a^A - p^A)} = \frac{p^A}{(a^A - p^A)}, \tag{15}$$

$$\varepsilon^C = \frac{dX^C p^C}{dp^C X^C} = b^C \frac{p^C}{b^C(p^C - a^C)} = \frac{p^C}{(p^C - a^C)}. \tag{16}$$

Then, from (7), (1) and (2),

$$\frac{TC}{TD} = \frac{b^A}{b^C} = \frac{M^A p^C - a^C}{X^C a^A - p^A} = \frac{M^A \eta^A p^C}{X^C \varepsilon^C p^A}. \tag{17}$$

We see from this expression that the extent of trade creation relative to trade diversion is inversely related to the ratio X^C/M^A, which is the share of non-FTA trade in country A's imports of the product. This is an intuitive measure of the potential for trade creation relative to trade diversion, because if the third-country share were very small, an FTA would be likely to cause substantial trade creation but would not have much scope for causing trade diversion. By contrast, if the third-country share were large, there would be much greater scope for an FTA to cause trade diversion. We will therefore focus our analysis on this simple predictor, the third-country share, of trade creation relative to trade diversion.[5]

While this relationship between the trade-creation-to-trade-diversion ratio and the third-country share is derived here in the context of a model with linear

[5]Alternatively, and almost equivalently, we could use as a measure *TC* as a fraction of the total increase in trade between countries A and B. Since the latter would be *TC*+*TD*, this alternative measure would be very closely related to ours, i.e., $TC/(TC + TD) = 1/(1 + TD/TC)$.

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export supply and import demand curves, the approach taken here is in fact quite a bit more general. For example, it can be extended to the case with general export supply and import demand curves in a straightforward manner. To see this, we can consider the incremental trade creation and diversion caused by a small reduction in the tariff rate on a PTA partner:

$$\frac{TC'}{TD'} = \frac{dM^A}{dX^C} = \frac{M^A \eta^A p^C dp^A}{X^C \varepsilon^C p^A dp^C} = \frac{M^A \eta^A}{X^C \varepsilon^C} d\left(\frac{p^A}{p^C}\right). \quad (18)$$

Hence, a version of the relationship we derived for the linear case immediately holds for small changes even with this greater level of generality.

The role of the key term M^A/X^C would even extend to a model with differentiated products. For example, Jammes and Ollareaga (2005) provide trade creation and trade diversion formulas for a partial equilibrium model with products that are differentiated by exporting country. It is easy to verify that the ratio of trade creation to trade diversion based on their formulas would again entail the term M^A/X^C and two elasticities, though in their context, one of those elasticities would be the elasticity of substitution between foreign varieties rather than the export supply elasticity as in our framework. This degree of generality is perhaps not surprising in light of the simple intuition we provided linking the relative prevalence of trade creation vs. trade diversion to the third-country share.

5. Empirical specification

Motivated by the theory from sections 3 and 4, we are interested in studying whether products are more likely to be excluded from an FTA when there is a greater potential for trade creation vs. trade diversion. We will specifically consider an empirical specification that takes the following form:

$$E_{ijp} = \beta_1 + \beta_2 r_{ijp} + \delta_{ij} + \varepsilon_{ijp}, \quad (19)$$

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where E_{ijp} is a binary variable that records whether product p is an excluded product in an FTA between importer i and exporter j. The main independent variable of interest is r_{ijp}, our measure of the extent of trade creation relative to diversion in this product. Following (17), for country i in an FTA with country j, r_{ijp} is country i's imports of product p from non-FTA countries *other than* country j as a fraction of country i's imports of product p from those countries as well as country j. For simplicity we call this country i's "third-country share" of product p in its FTA with country j. This measure excludes from both the numerator and denominator imports from countries in FTAs that were either already in place prior to the agreement between importer i and exporter j or that are concurrent.[6] Since the decision to exclude a product is itself likely to affect the trade flows between two partners, we calculate r_{ijp} using trade flows prior to the FTA between i and exporter j. We specifically use an average of the three years preceding the FTA so as to also help smooth out fluctuations related to business cycles.

In addition to r_{ijp}, our specification includes importer–exporter fixed effects, δ_{ij}, which ensure that our regression estimates compare products *within* a given importer–exporter pair. With these fixed effects, our estimates will effectively capture an average of the relationship between the third-country share and the likelihood of a product being excluded in each of the country pairs we study. In addition to importer–exporter fixed effects, we will also consider robustness tests that include product fixed effects. These product fixed effects would control for variations in import demand and export supply elasticities to the extent that these are similar for a product across countries. In another set of robustness tests, we also attempt to directly control for the elasticities using estimates from Soderbery (2018).

Given the broad range of countries and FTAs that are present in our sample, it will be useful to examine any potential heterogeneity in the effects that we identify through our baseline specification. To do this, we will make use of interaction terms so that we have empirical specifications of the following form:

[6]As robustness tests, we also use two alternative measures that treat trade with existing FTA partners differently. See section 7 for a more detailed discussion of these issues.

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$$E_{ijp} = \beta_1 + \beta_2 r_{ijp} + \beta_3 (r_{ijp} \times \boldsymbol{X}_{ijp}) + \delta_{ij} + \varepsilon_{ijp}, \quad (20)$$

where $\boldsymbol{X}_{ijp}$ is a vector of characteristics that we interact with r_{ijp}. As this notation suggests, these characteristics could potentially depend on the importer, exporter and product, though they may also vary in only one of those dimensions (e.g., only at the importer level). These interaction terms will shed light on the determinants of the relationship between r_{ijp} and E_{ijp}.

6. Data

For our empirical analysis, we require data on tariff rates under preferential trade agreements. While standard sources of trade data such as the UNCTAD TRAINS and the WTO–IDB should in principle contain this information, these data tend to have very incomplete coverage of FTAs and often report MFN tariff rates as applied tariffs even when there are in reality separate preferential tariffs. We overcome these limitations of the standard sources of tariff data by using a unique global tariff database from CEPII (Guimbard et al. 2012) that provides bilateral tariff rates at the six-digit HS product level for a large number of countries while exhaustively taking into account preferential trade agreements.[7] These data are available in the form of three-year averages for 2000–2002, 2003–2005, 2006–2008 and 2009–2011.

In determining whether a product is excluded from an FTA or not, we simply consider whether the applied tariff rate is positive in the latest available period, i.e., in 2009–2011. We use Mario Larch's Regional Trade Agreements Database from Egger and Larch (2008) to determine which countries are in FTAs with each other. We will focus on FTAs that entered into force in 2005 or earlier so that these agreements have had at least some time to phase in. It is possible that some of the products that we identify as

[7]Our analysis excludes trade in services, which by its nature is not subject to tariffs that can be removed in an FTA. Trade agreements sometimes do include relaxation or removal of barriers to trade in services, but these barriers are more likely to impose real costs on trade rather than financial transfers to government, and, in any case, we lack adequate information on these at this level of detail. Also, as explained in WTO (2011), trade diversion that results from lowering these real costs on a partner country does not have the negative effect of trade diversion due to a tariff preference.

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excluded are provisioned to eventually move towards a zero tariff rate under the FTA. Our data do not allow us to distinguish between such cases and cases where the tariff rate will remain positive in perpetuity, but it seems reasonable to consider a product that will retain a positive tariff for a relatively long period of time to still be an excluded product in a somewhat broader sense of the term.[8]

In addition to tariff data, our analysis also requires trade data at the six-digit HS-level. While the HS trade data from UNCOMTRADE technically are available starting in 1988, they become available for a broad set of countries only in the early to mid-1990s. With this in mind, we use trade data from 1995 onward. We specifically use a version of UNCOMTRADE from CEPII that uses a statistical procedure to weight either the importer- or exporter-reported data according to an estimated reliability level. Dealing with mirror data in this relatively thorough manner is likely to be useful for us, given that we have a broad range of countries covered in our database, including some that may have less precisely reported trade data.

Since we use trade data averaged over three years prior to an FTA coming into force, our sample will then include only FTAs that enter into force in 1998 or later. As just discussed, in order to give some time for an agreement to phase in, we also include only agreements up to 2005. We impose several additional restrictions, as well. First, we include only importing and exporting countries that have a population of at least 1 million during the entire 1995–2005 period. Second, we drop observations where exporter j does not export to importer i at all in the product in question, since there would then be no possibility of trade diversion as defined in our theoretical framework. We drop the European Union member countries as importers because of their common external tariffs, but we include them as exporters. For other customs unions, we still include each country separately because these customs unions have not fully implemented common external tariffs and so there is still likely to be substantial variation in tariffs at the country-level. We also drop observations where the MFN tariff was already equal to zero when the FTA came into force, since the FTA would then cause neither trade creation nor diversion. In order to determine MFN tariff rates, we use data from TRAINS, which contains

[8]Tariff cut phase-ins—their presence and their timing—could provide additional impact on the size and timing of trade. See Besedes et al. (2019) for a study of their role in the Canada–United States Free Trade Agreement.

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information on several years predating the period in which we have tariff data from CEPII. Finally, we drop importer–exporter pairs where no product is excluded from the tariff cuts and also those where more than 50% of products are excluded. The former account for about 20% of the potential sample and the latter for about 30%. Since our regression specifications include importer–exporter fixed effects, we necessarily need to drop country pairs with no exempted sectors. We drop country pairs with more than 50% exempted sectors because it is more difficult to interpret an "exemption" when the majority of products are exempted.[9]

Table 1 provides some summary statistics on our final sample, which includes a total of 37 importing countries and 240 importer–exporter pairs. While some countries have an agreement with a single partner, others have agreements with several dozen. Our sample includes a wide range of countries and includes a reasonable mix of high-, middle- and low-income countries. We can see from table 1 that the fraction of excluded products in this sample ranges from about 0.03 for Malawi to 0.44 for the Philippines, with an average across countries of about 0.16. Table 1 also reveals that the fraction of the total bilateral *trade* that is exempted—calculated based on three-year averages prior to the FTA coming into force—tends to be somewhat greater than the fraction of exempted products for most countries. As a result, the simple average value of this variable across the countries in our sample is about 0.20, suggesting that a substantial amount of trade is excluded from FTAs.[10] Tariff-cut phase-ins

Table 2 provides summary statistics at the sectoral rather than country level.[11] Note that while we report these summary statistics for fairly aggregated industries so as to make it easier to interpret the sectoral pattern of exclusions, our main empirical analysis is at the six-digit product code level. We can see from the second column that products are commonly excluded from FTAs across all types of industries. Exclusion

[9] In practice, we find that our regression results would be similar if we included the country pairs with more than 50% exempted sectors.

[10] When interpreting these numbers, it is important to remember that we exclude from our sample country pairs where no products are exempted and those where more than 50% of products are exempted. If we include all of these country pairs, the average fraction of products exempted rises to about 30% and the fraction of exempted trade to about 25%.

[11] The caveats from the previous footnote regarding the sample of country pairs included in our analysis apply to these numbers as well.

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rates are especially high for industries related to agricultural products where over a third of all products are excluded. Within manufacturing, exclusion rates are lowest for industries that provide inputs into production, such as metals and machinery. We explore some of this sectoral variation in more systematic detail within a regression framework later in the paper.

7. Results

We now turn to the main results of our empirical analysis. Table 3 shows the results from the baseline analysis. From column 1, we see that for the entire sample of countries, the effect of the third-country share on the likelihood of a product being exempted is positive and significant. The magnitude of the estimate implies that moving the third-country share from 0 to 1 would increase the probability of a product being exempted by about 6.5 percentage points. Recalling from (17) that the third-country share is positively related to trade diversion, this result suggests that, on average over the whole sample, a product is more likely to be exempted when there is a greater scope for trade diversion rather than for trade creation.

This result masks considerable heterogeneity across countries. Columns 2 and 3 repeat this analysis on samples of high-income (OECD) countries and non-high-income countries. We see that there is a substantial *negative* effect for high-income countries and a positive effect for other countries. The negative effect is consistent with the discussion in Deardorff (2018), who suggests that excluded products are ones that are *sensitive* and so are the ones where there is a greater scope for trade creation rather than trade diversion.

Columns 4, 5 and 6 repeat this analysis using a slightly different measure of the third-country share. In this case, we include all exporters that will enter into an FTA with the importer in the same year as the exporter under consideration in the denominator when calculating the third-country share. This specification helps account for cases where an importer may provide the same market access to all exporters entering into an FTA in the same year. This might be the case especially when multiple exporters are part of the same trade agreement. Since the third-country share measured in this manner less often

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takes a value of 1, it also allows us to test the robustness of our analysis on a somewhat larger number of importer–exporter–product combinations. As we see from columns 4 to 6, these results are very consistent with those from columns 1 to 3.

Our results in table 3 raise the question of why products with high third-country shares are less likely to be exempted only in high-income countries. We consider two potential reasons for this. First, developing countries tend to rely on tariffs as a source of government revenue to a much greater extent than do developed countries. That being the case, these governments may have a stronger incentive to keep positive tariffs on trade-diverting sectors so as to avoid the unnecessary loss of government revenue shown in (11).

A second potential reason is that developing countries may have less bargaining power when forming FTAs and so have to open up rather than protect industries where substantial trade creation is more likely. Plausibly, when an agreement between A and B is being negotiated, sectors in B that already export a substantial amount to A would be especially involved in trying to ensure that A opens up its market in these sectors. Such sectors would generally be ones with a substantial potential for trade creation. Therefore, when B is more powerful than A, A might be unable to exempt sectors with higher levels of trade creation.

We explore both of these potential explanations in table 4. As described in section 5, the approach we take is to include interaction terms of the third-country share with various country characteristics. The first column of table 4 essentially repeats the split sample analysis from table 2 but by including an interaction between the third-country share and a high-income indicator rather than considering high- and non-high-income countries separately. These estimates are consistent with table 4 in implying a negative effect for high income countries and a positive one for the rest of the sample.

The second column of table 4 introduces an interaction term between the third-country share and a variable that indicates whether a country is or is not highly reliant on tariff revenue. We code a country as having a high tariff reliance if it obtains more than 5% of government revenue through trade taxes. We obtain information on tariff reliance from the IMF's World Revenue Longitudinal Database. Our estimates indicate a more positive effect of the third-country share on the probability of a product being excluded

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when the country relies more on tariff revenue. This is consistent with the idea that countries that rely more on tariffs might have a stronger incentive to avoid causing substantial trade diversion. The magnitude or significance of the high-income interaction does not change substantially, however, suggesting that these tariff revenue considerations do not fully account for the differential effect for high-income countries.

The third and fourth columns include interactions of the third-country share with whether the partner country is high-income and whether the partner (i.e., the exporter) is larger than the importer, respectively. Both a high-income partner and a larger partner should be expected to have higher negotiating power and so allow us to explore the bargaining power explanation for our results discussed above. Consistent with this hypothesis, we see that the coefficients on these terms are positive and significant. This means that countries are less likely to protect trade-creating sectors when their partner is richer or relatively large. Since a greater degree of trade creation vs. trade diversion is desirable from a welfare perspective, these results are somewhat ironic in suggesting that countries with more negotiating power are likely to end up with less beneficial—or more possibly harmful—trade agreements as a result.

The last column reports the results of a regression that simultaneously includes all of the interaction terms. We see that our overall results are consistent with what we find when we include each interaction term separately. Taken together, these results imply a substantial variation across countries in the relationship between the third-country share and whether a product is excluded or not. This variation is consistent with the importance of both negotiating power and tariff revenue considerations.

While our results in tables 3 and 4 explore whether the relationship between the third-country share and the likelihood of a product being excluded varies depending on the income level of the importer, table 5 considers the importance of both the importer's and the exporter's income level. We specifically divide our observations into four categories depending on the income levels of the bilateral pair: (i) high-income importer and exporter (i.e., North–North), (ii) high-income importer and non-high-income exporter (i.e., North–South), (iii) non-high-income importer and high-income exporter (i.e., South–North) and (iv) non-high-income importer and exporter (i.e., South–South). The results for each subsample are reported in the first four columns of table 5.

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We see a strong negative relationship between the third-country share and exclusion for North–South agreements, a positive relationship for South–South and South–North agreements and no significant effect for North–North agreements. This pattern is consistent with our interpretation of the results from tables 3 and 4, since we see strong evidence for trade-creating products being excluded from FTAs specifically when we have a high-income importer entering into an agreement with a non-high-income exporter, something we would expect to be the case if exclusions are primarily determined by interest groups in the country with more negotiating power. The last column of table 5 uses interaction terms instead of a sample split, and it also includes the other interaction terms we considered in table 4. The results from this column are consistent with those from table 4 as well as from the other columns of table 5.

Table 6 reports the results of regressions that include two additional control variables that are also of some intrinsic interest. The first is the MFN tariff rate at the time the FTA between the pair of countries came into force. The second is an indicator of whether a sector accounted for a relatively large fraction of the importer's total imports from the partner in question prior to the FTA. Specifically, we classify a sector as relatively large if it is in the top half of sectors in terms of the share of overall bilateral trade that it accounts for. Table 6 shows, first of all, that our results from tables 2 and 3 continue to hold with no substantial change when these controls are included.

Table 6 also reveals that both developed and developing countries are more likely to exclude sectors with higher initial MFN tariffs, providing further evidence of the importance of these exclusions. As for our measure of relative size, we see that for the overall sample there is no significant relationship between this measure and the likelihood of exclusion. The sample split reveals, however, that developed countries are less likely to exclude relatively large sectors, while developing countries are more likely to exclude such sectors. The latter could again reflect tariff revenue considerations in developing countries, since higher bilateral trade conditional on the initial MFN tariff rate would correspond to sectors that would generate more revenue at MFN rates. It seems less obvious why developed countries would be less likely to exclude more important sectors. One possibility is that allowing greater market access in sectors that are

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important to partner countries may often be an inexpensive way for developed countries to extract concessions in other dimensions of the FTA negotiations.

Table 7 includes several industry-level characteristics whose potential importance was foreshadowed by the summary statistics in table 2. While we later control for all observable and unobservable product characteristics through the inclusion of product fixed effects (table 8), understanding how some of these characteristics affect the likelihood of exemption is of substantial interest in itself. We see from table 7 that agricultural products are much more likely to be excluded than non-agricultural products. This is what we would expect given the political sensitivity of agriculture in the context of trade agreements. The point estimate implies that the probability of exclusion for an agricultural product is 18 percentage points more than for a non-agricultural product. Conversely, capital goods and intermediate goods are substantially less likely to be excluded than are final consumption goods.[12] This is consistent with downstream industries pushing for the elimination of tariffs on their inputs. Finally, goods that are differentiated or reference-priced according to the Rauch (1999) classification are less likely to be excluded than homogeneous goods. A stronger incentive to exclude more homogeneous goods makes sense from the perspective of protecting domestic industries, since the import competition is more direct than with more differentiated products. It also makes sense from a tariff revenue perspective because there is presumably more scope for trade diversion in homogeneous products. The remaining columns of table 7 show that all of these sectoral patterns hold for both developed and developing countries.[13]

Table 8 repeats some of our key regressions with product fixed effects in addition to the importer–exporter fixed effects.[14] These fixed effects allow us to control for factors that make certain products more likely to cause trade creation vs. diversion across a range of importer–exporter pairs. This would therefore control for variations in the demand or export supply elasticities to the extent that these are similar for a product

[12]We classify goods as capital or intermediate after concording the HS6 products into the Broad Economic Categories (BEC) classification, which by construction can be mapped into intermediate, capital and final consumption goods.

[13]We also consider whether the effect of the third–country share is different for differentiated intermediate inputs, which are often likely to be customized inputs. We find some evidence of this for high income countries. These results are reported in the online appendix.

[14]We report the rest of our results with product fixed effects in the online appendix.

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across destinations, and hence bring us closer to directly capturing the trade-creation-relative-to-trade-diversion expression given by (17). We can see from table 8 that the inclusion of these additional fixed effects does not substantially affect any of the results from tables 2 and 3.

Table 9 reports our results while attempting to control for the ratio of the export supply elasticity to the import demand elasticity following (17). We use product-level estimates of both elasticities from Soderbery (2018), and also use Soderbery's trimming of outliers. The estimated effect of the elasticity ratio is very small and we report results by dividing the ratio by 1000 in order to meaningfully report the estimated coefficients. While the coefficient is statistically significant in the first and third columns, the point estimate is extremely small: the first column estimates would imply that moving from the 25th to the 75th percentile value of the elasticity ratio would decrease the probability of exclusion by less than 0.02/1000. As an alternative specification, the last three columns of table 9 use the log of the elasticity ratio instead of the ratio itself in order to further reduce the effect of outliers beyond Soderbery's trimming. No particularly clear pattern emerges from the coefficients on these elasticity terms, and they are not consistent with the first three columns. Our third-country share results, however, are robust across the board to the inclusion of these additional controls.[15]

While earlier trade agreements focused primarily on tariff rate cuts, various non-tariff provisions have become increasingly important in contemporary agreements. In table 10, we examine how the effect of the third-country share depends on the "depth" of an agreement, i.e., the extent to which non-tariff provisions are included within each FTA. We use data from Hofmann et al. (2017), who map in a binary fashion a number of FTA provisions for all agreements notified to the WTO since 1958. We focus specifically on their 14 "core" measures and classify agreements as high- or low-depth depending on whether they have more or less than the median number of core non-tariff provisions, which is 12. We should

[15] We also experimented with additional trimming of the outliers but found no clear pattern, with the results being quite sensitive to how outliers are defined.

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note that FTA exclusions are common in both low- and high-depth agreements, with about 15% and 10% of products respectively being excluded across agreements.[16]

We see from the first column of table 10 that for the entire sample, the positive effect of the third-country share on the probability of exclusion is driven by low-depth agreements and that the implied effect for high-depth agreements is roughly equal to zero. The difference between high- and low-depth agreements is statistically significant. When splitting the sample by income groups in the next two columns, we find a remarkably consistent pattern despite the opposite effects for high- vs. low-income countries. For high-income countries, the negative effect of the third-country share is driven by low-depth agreements and the implied effect for high-depth agreements is roughly equal to zero. The patterns for both groups of countries are consistent with tariffs being less of a focus in the design of deeper agreements, and therefore trade creation and trade diversion playing less of a role as arising from exemptions.

Tables 11 and 12 consider two additional sets of robustness tests that are designed to account for trade with past FTA partners in a manner different from what we do in the baseline. As mentioned in section 5, when calculating our third-country share measure, we exclude trade with countries that are already in an FTA with the importer in question. The rationale for this choice is that the new FTA would not strictly speaking cause trade diversion from the old FTA partner, but would instead be reversing some trade diversion that had occurred previously. Our three-country analysis does not allow us to take into account this type of "trade reversion" and so does not provide formal guidance about how such existing partners should be accounted for when calculating trade creation and trade diversion. In Deardorff and Sharma (2019), we study a four-country model that allows for such trade reversion. In that context, trade diversion could be defined either in a narrower sense so as to exclude trade reversion or in a broader sense so as to include it. This is further complicated by the fact that there are likely to be exemptions in the past agreements too, something that would affect whether a particular increase in trade with a new partner is more akin to trade creation or trade diversion in its welfare effects. With

[16]These numbers are somewhat different from the 16% average exclusion rate we reported in the text earlier because the latter was the average of the country averages reported in table 1.

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all this in mind, it makes sense to calculate the third-country share in a few additional ways.

Table 11 reports the results of regressions where we use the importer's share of overall trade, i.e., including trade with past FTA partners in the denominator of the measure of third-country share. These results are consistent with those obtained using our baseline measure. Table 12 instead simply uses one minus the overall FTA share as the third-country share. This would be the relevant measure in the four-country case based on Deardorff and Sharma (2019) if we do not count trade reversion as trade diversion, something that may make most sense in cases where there are no exemptions in past agreements. Unlike the measure used in table 11, which is for most practical purposes quite similar to our baseline measure, the measure in table 12 could be quite different because the exporting partner may often not account for a substantial portion of the overall FTA share of a product. Nevertheless, we see that these results are quite consistent with our baseline results.

Table 13 reports the results of an additional robustness test where we drop EU member countries as exporters. In our baseline analysis, we dropped EU countries as importers but included EU countries as exporters since a customs union implies a common external tariff but not necessarily that foreign countries will impose the same tariff rate on each customs union member. The inclusion of EU countries as exporters does however mean that the EU shows up in our baseline regressions in a relatively large number of observations. Table 13 shows that dropping the EU does not substantially affect our results. The only exception is that the coefficient on the interaction between the third-country share and the binary variable for exporter larger than importer is no longer statistically significant.

Finally, table 14 reports results when using a logit regression rather than the linear probability model that is our baseline model. We report coefficients in the form of odds ratio and provide the marginal effects in brackets. We see from the first three columns that marginal effects are very similar to those obtained with the linear probability model,

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and the signs of the interaction patterns are also fully consistent with the rest of our results.[17]

8. Conclusions

We set out to understand the extent to which countries leave some tariffs positive in FTAs, exempting them from the GATT/WTO requirement that most tariffs be removed. Our initial expectation was that countries would exempt sectors where they expected the FTA to be primarily trade-creating, since that would cause disruption of the domestic import-competing industry and therefore harm its firms and workers. Thus exempted sectors would be primarily what we called "sensitive."

Our empirical analysis, based on data from 37 importing countries and 240 importer–exporter pairs within FTAs, found the opposite when we did not control for country characteristics. Separating the sample into high- and low-income countries, and alternatively controlling for country income in an interaction term, we found the expected tendency for exempted sectors to be trade-creating in high-income countries, but the opposite in low-income countries. To explain the latter, we also included variables to indicate government reliance on tariff revenue and differences in country size that might reflect bargaining power. The results of both suggested that poor countries exempt sectors where loss of tariff revenue would be a concern and where the bargaining power of FTA partners would be important.

The perhaps surprising implication of all of this is that high-income countries tend to undermine the overall beneficial effects of their FTAs by exempting sensitive sectors from the tariff cuts, but that low-income countries do the opposite, and may even do so in response to pressure brought upon them by their richer or larger FTA partners. Thus it seems to be more likely that the small poor countries gain more, or are more likely to gain at all, from the FTAs that they enter into because of their different choice of exempted sectors.

[17] We do not report the marginal effects for the interaction terms because these are especially difficult to define and interpret when working with non–linear models.

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Supporting information

Supplementary material accompanies the online version of this article.

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Table 1

Country-level descriptive statistics

Importer	Fraction exc. products	Fraction exc. trade	No. of partners	Earliest FTA	Latest FTA
ALB	0.09	0.26	7	2002	2004
AUS	0.24	0.15	2	2005	2005
BIH	0.15	0.14	5	2002	2004
CAN	0.06	0.03	1	2002	2002
CHE	0.10	0.05	9	1999	2005
CHL	0.05	0.05	26	2002	2004
CRI	0.24	0.46	3	2002	2002
DOM	0.09	0.15	5	2001	2002
DZA	0.06	0.16	14	1998	1999
GTM	0.14	0.15	2	2001	2001
HND	0.14	0.26	2	2001	2001
HRV	0.11	0.05	30	1998	2004
IDN	0.01	0.01	1	1999	1999
IND	0.20	0.25	1	2001	2001
ISR	0.14	0.11	9	1998	2004
JPN	0.20	0.05	2	2002	2005
KOR	0.19	0.03	1	2004	2004
LKA	0.21	0.34	2	2001	2005
MAR	0.11	0.21	14	1998	1999
MDA	0.11	0.54	4	2004	2004
MEX	0.06	0.04	28	1998	2004
MKD	0.30	0.55	28	2000	2004
MOZ	0.06	0.09	7	2000	2000
MUS	0.06	0.12	3	2000	2001
MWI	0.03	0.35	1	2000	2000

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MYS	0.28	0.27	1	1999	1999
NIC	0.07	0.23	2	1998	2002
NOR	0.24	0.29	9	1999	2005
NZL	0.16	0.05	2	2001	2005
PAN	0.26	0.26	2	2003	2004
PHL	0.44	0.84	1	1999	1999
SLV	0.28	0.41	3	2001	2003
SRB	0.16	0.00	5	2004	2004
UKR	0.18	0.04	1	2001	2001
USA	0.10	0.05	3	2001	2005
VNM	0.43	0.00	1	1999	1999
ZMB	0.23	0.32	3	2000	2001

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Table 2

Industry-level descriptive statistics

	Average share of trade	Average fraction of excluded products	Number of HS6 products
Animal & animal products	0.04	0.35	193
Vegetable products	0.10	0.35	318
Foodstuffs	0.13	0.41	179
Mineral products	0.09	0.06	148
Chemicals, etc.	0.09	0.08	751
Plastics/rubbers	0.04	0.10	189
Raw hides, skins, etc.	0.02	0.15	74
Wood & wood products	0.04	0.08	223
Textiles	0.08	0.14	809
Footwear/headgear	0.02	0.12	55
Stone/glass	0.03	0.10	187
Metals	0.12	0.04	545
Machinery/electrical	0.12	0.06	758
Transportation	0.04	0.07	132
Miscellaneous	0.04	0.05	382

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Table 3

Baseline regressions

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Exempted sector indicator					
Third-country share	0.065***	-0.195***	0.076***			
	(0.007)	(0.032)	(0.007)			
Third-country share (combined)				0.056***	-0.204***	0.060***
				(0.008)	(0.034)	(0.008)
Observations	112,378	34,796	77,582	243,822	38,654	205,168
R-squared	0.209	0.074	0.259	0.190	0.076	0.207
Importer–exporter FEs	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	High income	Not high income	All	High income	Not high income

NOTES: Standard errors are clustered at the importer–product level.

*** p<0.01, ** p<0.05, * p<0.1

Table 4

Regressions with interaction terms

	(1)	(2)	(3)	(4)	(5)
	Dependent variable: Exempted sector indicator				

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Third-country share	0.076***	0.068***	0.036***	0.002	–0.037***
	(0.007)	(0.008)	(0.008)	(0.008)	(0.010)
Third–country share x High income	–0.271***	–0.264***	–0.264***	–0.245***	–0.225***
	(0.032)	(0.033)	(0.032)	(0.032)	(0.032)
Third–country share x High tariff reliance		0.029**			0.077***
		(0.015)			(0.016)
Third–country share x High-income partner			0.065***		0.065***
			(0.012)		(0.015)
Third–country share x Exporter larger				0.105***	0.077***
				(0.011)	(0.013)
Observations	112,378	112,378	112,378	111,603	111,603
R–squared	0.210	0.210	0.210	0.212	0.212
Importer–exporter FEs	Yes	Yes	Yes	Yes	Yes
Sample	All	All	All	All	All

NOTES: Standard errors are clustered at the importer–product level.

*** p<0.01, ** p<0.05, * p<0.1

Table 5

Samples split based on income levels of both importer and exporter

	(1)	(2)	(3)	(4)	(6)
	Dependent variable: Exempted sector indicator				
Third-country share	-0.049	-0.343***	0.097***	0.042***	-0.095**
	(0.043)	(0.045)	(0.010)	(0.008)	(0.043)
Third-country share x North from South					-0.273***
					(0.061)
Third-country share x South from North					0.116***
					(0.044)
Third-country share x South from South					0.067
					(0.045)
Third-country share x High tariff reliance					0.068***
					(0.016)
Third-country share x Exporter larger					0.081***

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					(0.013)
Observations	8,901	25,895	47,110	30,472	111,603
R-squared	0.036	0.076	0.329	0.148	0.213
Importer–exporter FEs	Yes	Yes	Yes	Yes	Yes
Sample	North–North	North–South	South–North	South–South	All

NOTES: Standard errors are clustered at the importer–product level.

*** p<0.01, ** p<0.05, * p<0.1

Table 6

Additional controls

	(1)	(2)	(3)	(4)
	Dependent variable: Exempted sector indicator			
Third-country share	0.055***	-0.286***	0.075***	-0.045***
	(0.008)	(0.037)	(0.008)	(0.009)
MFN tariff at FTA start	0.178***	0.196***	0.162***	0.178***
	(0.048)	(0.074)	(0.061)	(0.048)
Relatively high import sector	0.001	-0.052***	0.024***	-0.001
	(0.002)	(0.004)	(0.003)	(0.002)
Third-country share x High income				-0.237***
				(0.037)
Third-country share x High tariff reliance				0.131***
				(0.022)
Third-country share x High-income partner				0.091***
				(0.021)
Third-country share x Exporter larger				0.044**
				(0.019)
Observations	98,237	31,887	66,350	98,237
R-squared	0.238	0.122	0.293	0.240
Importer–exporter FEs	Yes	Yes	Yes	Yes
Sample	All	High	Not high	All

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			income	income

NOTES: Standard errors are clustered at the importer–product level.

*** p<0.01, ** p<0.05, *p<0.1

Table 7

Product characteristics

	(1)	(2)	(3)	(4)
	Dependent variable: Exempted sector indicator			
Third-country share	0.064***	-0.094***	0.071***	-0.020**
	(0.007)	(0.030)	(0.007)	(0.010)
Agricultural product	0.182***	0.250***	0.163***	0.182***
	(0.011)	(0.022)	(0.012)	(0.011)
Intermediate input	-0.109***	-0.135***	-0.098***	-0.111***
	(0.004)	(0.007)	(0.005)	(0.004)
Capital good	-0.139***	-0.169***	-0.126***	-0.140***
	(0.004)	(0.007)	(0.005)	(0.004)
Differentiated good	-0.039***	-0.039***	-0.037***	-0.038***
	(0.007)	(0.010)	(0.009)	(0.007)
Reference-priced good	-0.027***	-0.018	-0.028***	-0.028***
	(0.007)	(0.011)	(0.009)	(0.007)
Third-country share x High income				-0.145***
				(0.031)
Third-country share x High tariff reliance				0.051***
				(0.017)
Third-country share x High-income partner				0.065***
				(0.015)
Third-country share x Exporter larger				0.056***
				(0.013)
Observations	90,150	28,494	61,656	89,525
R-squared	0.282	0.173	0.326	0.285
Importer–exporter FEs	Yes	Yes	Yes	Yes
Sample	All	High income	Not high income	All

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NOTES: Robust standard errors are in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

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Table 8

Product fixed effects

	(1)	(2)	(3)	(4)
	Dependent variable: Exempted sector indicator			
Third-country share	0.053***	-0.133***	0.062***	-0.025***
	(0.006)	(0.028)	(0.006)	(0.010)
Third-country share x High income				-0.177***
				(0.028)
Third-country share x High tariff reliance				0.056***
				(0.015)
Third-country share x High-income partner				0.048***
				(0.014)
Third-country share x Exporter larger				0.060***
				(0.012)
Observations	112,295	34,425	77,366	111,521
R-squared	0.399	0.410	0.446	0.403
Importer–exporter FEs	Yes	Yes	Yes	Yes
Product FEs	Yes	Yes	Yes	Yes
Sample	All	High income	Not high income	All

NOTES: Standard errors are clustered at the importer–product level.

*** p<0.01, ** p<0.05, * p<0.1

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Table 9

Soderbery (2018) elasticities

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Exempted sector indicator					
Third-country share	0.082***	-0.119**	0.079***	0.082***	-0.109**	0.079***
	(0.008)	(0.052)	(0.008)	(0.009)	(0.052)	(0.008)
$(\varepsilon^C/\eta^A)/1000$	-0.059***	-0.029	-0.063***			
	(0.009)	(0.020)	(0.011)			
Log ε^C/η^A				-0.000	0.014***	-0.002
				(0.002)	(0.005)	(0.002)
Observations	46,376	10,834	34,530	46,376	10,834	34,530
R-squared	0.435	0.525	0.506	0.435	0.526	0.506
Importer–exporter FEs	Yes	Yes	Yes	Yes	Yes	Yes
Product FEs	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	High income	Not high income	All	High income	Not high income

NOTES: Standard errors are clustered at the importer–product level.

*** p<0.01, ** p<0.05, * p<0.1

Table 10

Agreement depth

	(1)	(2)	(3)	(4)
	Dependent variable: Exempted sector indicator			
Third-country share	0.108***	-0.397***	0.125***	0.006
	(0.010)	(0.049)	(0.011)	(0.015)
Third-country share x High agreement depth	-0.083***	0.338***	-0.096***	-0.054***
	(0.012)	(0.064)	(0.012)	(0.012)

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Third-country share x High income				-0.227***
				(0.032)
Third-country share x High tariff reliance				0.071***
				(0.017)
Third-country share x High income partner				0.059***
				(0.015)
Third-country share x Exporter larger				0.062***
				(0.013)
Observations	112,378	34,796	77,582	111,603
R-squared	0.209	0.076	0.260	0.213
Sample	All	High income	Not high income	All

NOTES: Standard errors are clustered at the importer–product level.

*** p<0.01, ** p<0.05, * p<0.1

Table 11

Third-country share including past FTA partners

	(1)	(2)	(3)	(4)
	Dependent variable: Exempted sector indicator			
Third-country share (inc.)	0.073***	-0.206***	0.089***	-0.040***
	(0.007)	(0.032)	(0.007)	(0.010)
Third-country share (inc.) x High income				-0.244***
				(0.032)
Third-country share (inc.) x High tariff reliance				0.103***
				(0.017)
Third-country share (inc.) x High-income partner				0.079***
				(0.016)
Third-country share (inc.) x Exporter larger				0.088***
				(0.014)
Observations	112,378	34,796	77,582	111,603

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R-squared	0.209	0.074	0.259	0.212
Importer–exporter FEs	Yes	Yes	Yes	Yes
Sample	All	High income	Not high income	All

NOTES: Standard errors are clustered at the importer–product level.

*** p<0.01, ** p<0.05, * p<0.1

Table 12

Third-country share as one minus FTA share

	(1)	(2)	(3)	(4)
	Dependent variable: Exempted products indicator			
1 – FTA share	0.038***	-0.150***	0.049***	-0.051***
	(0.008)	(0.031)	(0.008)	(0.010)
(1 – FTA share) x High income				-0.156***
				(0.032)
(1 – FTA share) x High tariff reliance				0.078***
				(0.018)
(1 – FTA share) x High-income partner				0.080***
				(0.014)
(1 – FTA share) x Exporter larger				0.059***
				(0.014)
Observations	112,378	34,796	77,582	111,603
R-squared	0.208	0.074	0.258	0.211
Importer–exporter FEs	Yes	Yes	Yes	Yes
Sample	All	High income	Not high income	All

NOTES: Standard errors are clustered at the importer–product level.

*** p<0.01, ** p<0.05, * p<0.1

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Table 13

Regressions excluding EU countries as exporters

	(1)	(2)	(3)	(4)
	Dependent variable: Exempted sector indicator			
Third-country share	0.035***	-0.222***	0.053***	-0.029***
	(0.007)	(0.037)	(0.008)	(0.009)
Third-country share x High income				-0.252***
				(0.038)
Third-country share x High tariff reliance				0.112***
				(0.018)
Third-country share x High-income partner				0.140***
				(0.024)
Third-country share x Exporter larger				0.017
				(0.018)
Observations	66,258	30,868	35,390	65,483
R-squared	0.120	0.082	0.149	0.124
Importer–exporter FEs	Yes	Yes	Yes	Yes
Sample	All	High income	Not high income	All

NOTES: Standard errors are clustered at the importer–product level.

*** p<0.01, ** p<0.05, * p<0.1

Table 14

Logistic regression

	(1)	(2)	(3)	(4)
	Dependent variable: Exempted sector indicator			
Third-country share	0.681***	-1.495***	0.802***	-0.420**
	(0.072)	(0.206)	(0.074)	(0.196)
	[0.053]	[-0.121]	[0.062]	

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Third-country share x High income				-1.797***
				(0.233)
Third-country share x High tariff reliance				0.497***
				(0.171)
Third-country share x High-income partner				0.751***
				(0.167)
Third-country share x Exporter larger				0.655***
				(0.165)
Observations	112,234	34,796	77,438	111,459
Importer–exporter FEs	Yes	Yes	Yes	Yes
Sample	All	High income	Not high Income	All

NOTES: Reported coefficients are odds ratios, with marginal effects in brackets. Standard errors, clustered at the importer–product level, are reported in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

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