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Reduced "Border Effects", FTAs and International Trade*

Sebastian Franco† and Erik Frohm‡

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Abstract

This paper studies the role of reduced barriers to international trade from two dimensions: (i) the implementation of Free Trade Agreements and (ii) declining "border effects". Our empirical estimates suggest that diminished border effects accounts for the bulk of the increase in international trade in manufactured goods since 1970. The cost of a national border has fallen by around 10% per year for total exports, whereas it has declined by 13% for exports of final goods and 8% for intermediate inputs. The introduction of FTAs have an important role to play as well, raising international trade by 54% after 10 years according to our estimates. We also find evidence that more recent FTAs have a greater trade effect than those signed in earlier periods. Moreover, when estimating the effect of FTAs, we show that it is important to control for *different* border effects for final goods and intermediate inputs.

Keywords: Border effect, Free trade agreements, international trade, global value chains.

JEL codes: F13, F14, F15, F23

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1 Introduction

The world has experienced an unprecedented rise in global trade over the past three decades. Exports and imports as a share of global GDP rose from 39% in 1990 to 56% in 2016 according to the World Bank. Massive trade liberalization initiatives with the signing of Free Trade Agreements (FTAs) and advances in information and communication technology (ICT) are often pointed out as the main drivers of this "second unbundling" of globalization (Baldwin, 2016).

Several studies have documented the important role of FTAs for boosting international trade. Nevertheless, it was not until fairly recently that economists could actually claim reliable empirical support for the strong positive effect of FTAs. In a meta-analysis, Cipollina and Salvatici (2010) find a range of estimates between 12 percent and 285 percent. Baier and Bergstrand (2007) addressed a host of the econometric issues common in the earlier literature and showed that the quantitative estimates of the average effect of an FTA on bilateral trade is positive, strong (around 100 percent) and significant.[1]

The impact of other trade barriers is usually studied through the concept of the "border effect". It was first documented by McCallum (1995) who showed a significant home bias in Canadian-US trade.[2] The bias is usually considered to embody a host of factors, such as preferences (Morey, 2016). It has been also understood as the inherent costs of moving a good or service across a border. For example, Anderson and van Wincoop (2003) used international border dummies to control for international trade costs relative to intra-national trade costs in a cross-sectional gravity equation with international and domestic sales. Unobservable fixed and variable export costs are especially important in the "New" New Trade Theory (see for instance Melitz 2003).

[1] Bergstrand et al. (2015) include a useful discussion on the preferred specification of the empirical gravity equation to obtain reliable empirical estimates of FTAs and border effects. It should include exporter-year, importer-year and country-pair fixed effects to control for endogenous prices, multilateral resistance terms and time-invariant pair-specific effects. It should be estimated with a Poison Pseudo Maximum Likelihood estimator and include intra-national as well as international trade flows and international border dummies to capture declining bilateral trade costs

[2] This finding gave rise to the puzzle of "home bias in trade" mentioned by Obstfeld and Rogoff (2000).

But the empirical estimates of the size of the border effect varies, and some even question the existence of it (Gorodnichenko and Tesar, 2009).

In a recent paper, Bergstrand et al. (2015) find reduced border effects from 1990-2002. In their framework, the cost of a national border is estimated to have decreased by around 2.5% per year and increased manufacturing exports by 34% relative to domestic manufacturing sales. However, they only consider a short time period when the "second unbundling" of globalization was already under way. Moreover, they do not consider that the border effect might be different for trade in final goods or intermediate inputs. It is important to distinguish between these different types of goods with the continuous rise of trade in global value chains (Feenstra 1998 and Baldwin and Taglioni 2014).

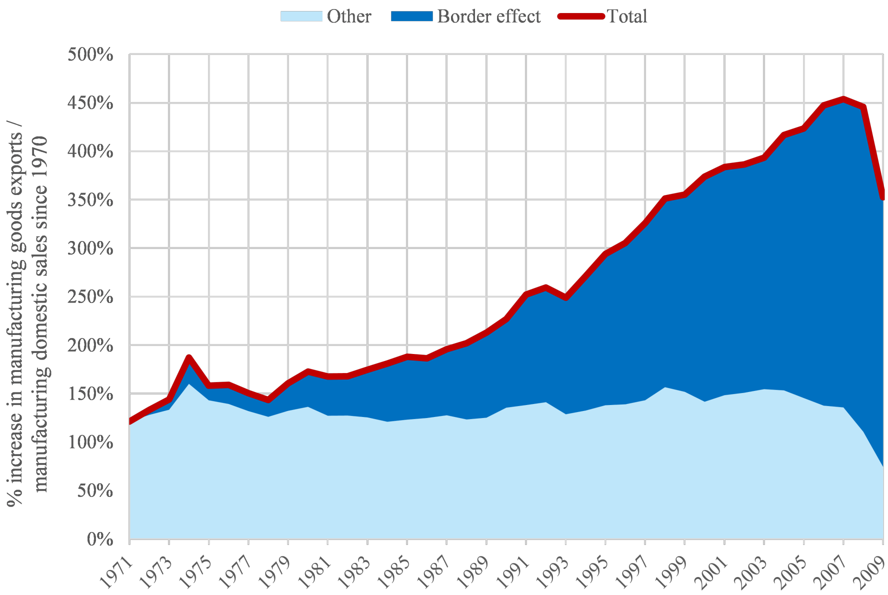
This paper contributes to the literature by documenting diminished border effects over a longer period of time (1970-2009), their evolution for final goods and intermediate inputs and the trade impact of FTAs. We apply the most up-to-date and theory-consistent empirical gravity methods to provide precise estimates of their effects (Yotov et al., 2016).[3] As already explained by Bergstrand et al. (2015), the reduction of the border effect plays a key role in boosting trade over time. According to our results, they have been the prime driver of the increase in international trade in manufacturing goods since the 1970s. We estimate that the cost of a national border has fallen by around 10 percent per year.

This is illustrated in Figure (1) which highlights one of the main results of this paper: that the increase in exports of manufacturing goods relative to the rise in domestic manufacturing sales since 1970 has been dominated by reduced border effects. FTAs, comparative advantages, relative prices, multilateral resistances and other non-time varying country-pair factors are quantitatively much less important. This gives some sense of the magnitudes of the different factors traditionally thought to have driven the rise in global trade (Mussa 2000 and Baldwin 2016).

Since we cover a longer time period than Bergstrand et al. (2015) and relax the

[3]We use a PPML estimation with high dimensional fixed effects (exporter-time, importer-time, and country-pair) to control for all confounding factors. The estimation strategy is carefully explained later in the paper.

Figure 1: Rise of international trade in manufacturing goods



Note: The chart utilises the estimates from Table (2) which includes export-year, importer-year and country-pair fixed effects and controls for whether two countries have an FTA or not. The border effect is defined as a dummy which equals zero if trade is within a country and one if trade is between two countries. It is interacted with year-dummies (where 1970 equals zero). Further details are in Section (4).

heavy restriction recommended by Cheng and J.Wall (2005) to use data in three or five years interval, we can look at the timing of the diminished border effects and gain some additional insights into its drivers. A key ingredient in our analysis is trade data on final goods and intermediate inputs covering both cross-border sales as well as domestic sales over a long period of time.

When we distinguish the border effects for the two types of goods, we see that reductions in the border effect has expanded trade in final goods by more than in intermediate inputs. This likely reflect the fact that bilateral gross final goods exports embody a larger portion of gross imports of intermediate inputs from earlier steps of the supply chain than bilateral trade in intermediate goods. These goods must bear the full burden of trade costs (due to technological hindrances) added in previous steps in production.[4] As these costs are reduced, final goods trade is likely to be

[4]Rouzet and Miroudot (2013) show that tariffs and other trade costs cumulate and that even

stimulated to a greater extent at the bilateral level.[5]

The differential impact on the two types of goods coincides with the ICT Revolution that started between 1986-1990 and drove the "second unbundling" of globalization and the expansion of global value chains (Baldwin, 2016). The bundle of technological advances during this period offers a deep motivation and timing for the reduction in trade costs and diminished border effects.[6] Lowering these trade barriers have likely less to do with traditional trade policies and more to do with productivity enhancing technological innovations that allows goods, tasks and services to flow more freely across borders.

This is not to say that trade policy does not matter. The introduction of FTAs have an important role to play as well, raising international trade by 54% after 10 or more years according to our estimates. We also find evidence that more recent FTAs have a greater trade effect than those signed in earlier periods. Moreover, when estimating the effect of FTAs, we show that it is important important to control for *different* border effects for final goods and intermediate inputs.

The rest of the paper is structured as follows: Section (2) introduces the structural framework that we use and derive our empirical approach. Section (3) outlines the data used. Section (4) presents and discusses our results and Section (5) performs a number of robustness checks. Section (6) concludes.

small trade costs can have adverse consequences when inputs are part of complex value chains that finally constitute final products.

[5]Antras and Chor (2018) also find that trade costs fell more for final goods than intermediates between 1995-2011.

[6]The ICT revolution lowered transport costs and was based on low computing and data storage costs, advances in the transmission of information, and the reorganization of production with new working methods and workplace organizations. This made it easier, cheaper, faster, and safer to coordinate separate complex activities spatially. The key here is not cost per se. Air shipments have been getting cheaper, but the speed is associated with certainty and this matters. When things go wrong in an international production network, air cargo allows the off-shoring firms to fix it in days. Finally, one should not forget about the strong reduction in transportation costs due of the introduction of the container in the 1960s that grew in importance in the 1970s and 1980s.

2 Framework and empirical approach

Our empirical approach is derived from a structural gravity equation able to capture the different trade barriers we are interested in. The effect of the border effect and FTAs is studied with a PPML estimator that properly maintains the structural approach of the gravity equation and uses a high dimensional set of fixed effects that controls for the potential confounding factors that could bias the results. Also, the inclusion of the large set of fixed effects will make possible to track the evolution of the effect on trade of FTAs over time.

2.1 Structural gravity

Structural gravity models are widely used in the trade literature. Head and Mayer (2014) show that the gravity equation is consistent with a very large number of theoretical foundations. To guide our analysis, we extend the gravity equation to account for different kinds of trade barriers and their differential effect on trade in final goods and intermediate inputs. Therefore, the bilateral exports between country i and j in good $k \in \{final,\ input\}$, X_{ij}^k, is determined in the following expression:

$$X_{ij}^k = \frac{{b_{ij}^k}^{-1} \ \left(\ \tau_{ij,FTA}^k \ \ w_i^k \ \right)^{-\sigma^k}}{P_j^k} \ \ E_j^k \tag{1}$$

where E_j^k is the total expenditure in good $k \in \{final,\ input\}$ in destination country j.[7] P_j^k is the importer price-level, while w_i represent the exporter's wage and any comparative advantage factor.[8] Regarding the trade barriers, the term ${\tau_{ij}^k}^{-\sigma}$ represents the trade costs that are altered by an FTA. It includes not only tariff but also non-tariff measures that can hamper international trade. The trade cost terms ${b_{ij}^k}^{-1}$ includes all kinds of trade frictions (not related with tariff and non-

[7] Note that it is important to distinguish between final and intermediate goods when controlling for this total expenditure in destination (Baldwin and Taglioni, 2014). While for final goods it is related to total final demand at the sector level, for intermediate goods it is related to the total expenditure on intermediate goods, also at the sector level.

[8] These terms represent inward and outward multilateral resistances in a general equilibrium framework, as in Anderson and van Wincoop (2003).

tariff measures that are imposed on traded goods in the destination) that reduce international trade in comparison to intra-national flows. This is the border effect. Reductions in both trade cost terms, ${\tau_{ij}^{k}}^{-\sigma}$ and ${b_{ij}^{k}}^{-1}$, are expected to have a positive effect on trade. Note that the good type dimension, $k \in \{final,\ input\}$, is considered because all terms are potentially different for each type of good.

2.2 Empirical approach

We estimate the structural gravity equation as follows:

$$X_{ij,t} = \exp\left(\sum_{s=0}^{10+} \beta_{fta,t-s} FTA_{ij,t-s} + \eta_{i,t} + \psi_{j,t} + \overrightarrow{\gamma_{ij}}\right) + \varepsilon_{ij,t} \qquad (2)$$

where $X_{ij,t}$ is the bilateral exports from country i to country j at time t.[9] $FTA_{ij,t-s}$ is an indicator that takes the value one if a country-pair has a FTA, or stronger economic integration agreement, in place in a given year t. We include up to ten lags ($s = 10+$) of the FTA indicator to capture the dynamics of this effect, with the $\beta_{fta,t-10+}$ coefficient capturing the "long-term effect" (after 10 or more years).[10] We also use a rich set of fixed effects that control for many confounding factors that can bias the FTA-coefficient: importer-time fixed effects, $\psi_{j,t}$, which captures the time-varying expenditure term in the destination trading partner (E_j^k); while the exporter-time, $\eta_{i,t}$, captures the time-varying comparative advantage term of the origin country (w_i).[11] These fixed effects also absorb any price deflator index and exchange rate fluctuations over time (P_j^k).[12]

Finally, the country-pair fixed effects, $\overrightarrow{\gamma_{ij}}$, control for the potential endogeneity

[9] We omit the sector index since we focus on the manufacturing sector.

[10] Typically, FTAs are phased in over 5 to 10 years (Baier and Bergstrand, 2007). The lagged effects on bilateral trade flows also stem from the fact that trade responds slowly to terms-of-trade changes.

[11] These importer-time and exporter-time fixed effects capture the multilateral resistance terms of a general equilibrium framework, as in Anderson and van Wincoop (2003).

[12] Baldwin and Taglioni (2014) discuss in detail the mistakes to be avoided in gravity equation estimations, like implications of inappropriate deflation of nominal trade values. Their most preferred econometric specification is one with non-deflated trade values. As they explain, in addition to accounting for the multilateral resistances in a dynamic setting, fixed effects also eliminate any problems arising from the incorrect deflation of trade.

of FTAs that arises from the fact that country pairs signing FTAs might be more likely to trade in the first place.[13] These country-pair fixed effects are directional, that is, they control for potentially asymmetric country-pair factors. Moreover, the fact that we are able to include all these fixed effects eliminates concerns about potentially autocorrelated errors in a panel regression. Note that after the inclusion of these fixed effects, the only variability that we use stems from the country-pair time-varying factors like the effect of the introduction FTAs.

We estimate Equation (2) with a Poisson-Pseudo Maximum Likelihood (PPML) estimator. It allows for zero trade flows across countries and avoids inconsistent estimations as a consequence of the log-linearizing the error term (Silva and Tenreyro, 2006).[14] The use of high dimensional fixed effects specification in the PPML estimation is possible thanks to the algorithm developed by Zylkin (2017).

There is one last potential econometric issue that needs to be considered. The literature estimating the impact of FTAs effect has usually followed the argument made by Cheng and J.Wall (2005) that "fixed-effects estimations are sometimes criticized when applied to data pooled over consecutive years on the grounds that dependent and independent variables cannot fully adjust in a single year's time". To avoid this critique, Baier and Bergstrand (2007) use 5-year intervals, Anderson and Yotov (2016) use 4-year intervals, and Trefler (1993) uses 3-year intervals. We use consecutive years data to guarantee the precision of all our estimations. Nevertheless, to make our results comparable and to make sure that such an econometric issue does not affect our results, we also report all our results using 5-year intervals data. We show that relaxing the constraint of using year interval data (limiting the number of observations we can use) does not affect our results. It is very likely that Cheng and J.Wall (2005)'s argument was justified when the econometric specifications did not

[13]The main contribution made by Baier and Bergstrand (2007) was to show that not including the country-pair fixed effect bias the FTA coefficient towards zero.

[14]The log-linearization of zeros is infeasible, and the expected value of the log-linearized error will, in general, depend on the covariates, and hence OLS will be inconsistent. Using robust or clustered standard errors affect the estimated standard errors, but will have no effect at all on the estimates of the parameters. Therefore, the log-linear model will generally be invalid with or without the robust or clustered standard errors. PPML, on the other hand, delivers estimates of the parameters that are consistent under general conditions. See Silva and Tenreyro (2006) for more details.

include lags.[15]

2.2.1 Trade in final goods and intermediates

The emergence of global value chains in the past decades has been characterized by the increasing importance of trade in intermediate inputs. Caliendo and Parro (2015), building on the work of Eaton and Kortum (2002), is an example of a structural gravity model which incorporates trade in intermediate inputs in the evaluation of the welfare effects of tariff changes. In our case, we are interested in the overall effect border effects and FTAs, both tariff and non-tariff measures. As will be explained in more detail in the data section, we use international input-output tables that naturally differentiate between trade in final goods and intermediate inputs.

In order to carry out the analysis, we estimate Equation (2) using data for each type of trade. This is required to test the significant differences of the effects for both final goods and intermediate inputs. Therefore, we use data for both types of goods in the same estimation by extending our econometric approach and interacting the FTA variable with a dummy for a given type of good (intermediates in our case), as follows:

$$
\begin{aligned}
X_{ij,t}^{k} = \exp\Bigg(& \sum_{s=0}^{10+} \beta_{fta,t-s} FTA_{ij,t-s} + \sum_{s=0}^{10+} \beta_{fta-input,t-s} FTA_{ij,t-s} * Input_{ij,t} \\
& + \eta_{i,t}^{k} + \psi_{j,t}^{k} + \overrightarrow{\gamma_{ij}^{k}} \Bigg) + \epsilon_{ij,t}^{k}
\end{aligned}
\tag{3}
$$

Note that Equation (3) expand the set of fixed effects accordingly to the observation unit, which now is bilateral trade flows in a given good and year. All fixed effects are also allowed to vary by good type (finals or intermediate) identified by k. Therefore, the origin-time fixed effects become origin-type-time effects, the destination-time fixed effects become destination-type-time effects, and pair-specific terms become origin-destination-type specific. This is particularly important for the

[15] Remember that we allow the FTA variable to have a lagged effect of up to 10 years, similar to the more recent contributions to the literature.

destination-time fixed effect that captures the total expenditure in the destination, and it is expected to be different for final and intermediate goods (Baldwin and Taglioni, 2014).

2.2.2 The border effect and use of intra-national trade

On top of using bilateral international trade data, we also include domestic sales. Fally (2015) explains that the gravity model is micro-consistent to the extent that domestic and international trade flows sum up to output for each source country and sum up to expenditures for each destination country. Otherwise, the multilateral resistance indexes implied by the fixed-effects with Poisson-Pseudo Maximum Likelihood (PPML) would not satisfy the structural gravity constraints based on actual output and expenditures. In other words, the equivalence between structural gravity and gravity with fixed-effects and a PPML-estimator would not hold.

In addition, Bergstrand et al. (2015) argue that estimations of the FTA-effect may be biased upward due to inadequate control for time-varying exogenous unobservable changes in bilateral export costs. Fixed export costs are especially important considering their prominence in the "New New" trade theory (see for instance Melitz 2003). Bergstrand et al. (2015) find evidence of this bias and report a declining effect of "international borders" on world trade.

But the motivation for also including intra-national trade data is stronger in our case. It is not only about being consistent with the theoretical foundations of the gravity equation and controlling for time-varying exogenous unobservable changes in bilateral export costs. We use it as identification strategy to estimate the potentially different effect of the reduction of trade barriers (other than those altered by FTAs) on final goods and intermediate inputs. To make this point clear, we review our econometric specification to consider both FTAs and the border effect:[16]

[16]Intra-national trade flow data is naturally available in international input-output tables used for global value chains analysis. See the data section for more details.

$$
\begin{aligned}
X^k_{ij,t} = \exp \Bigg(& \sum_{s=0}^{10+} \beta_{fta,t-s} FTA_{ij,t-s} + \sum_{s=0}^{10+} \beta_{fta-input,t-s} FTA_{ij,t-s} * Input_{ij,t} \\
& + \sum_{t \neq t_0}^{T} \beta_{b,t} B_{i \neq j,t} + \sum_{t \neq t_0}^{T} \beta_{b,t} B_{i \neq j,t} * Input \\
& + \eta^k_{i,t} + \psi^k_{j,t} + \overrightarrow{\gamma^k_{ij}} \Bigg) + \epsilon^k_{ij,t}
\end{aligned} \tag{4}
$$

First, note that in Equation (4) we include a set of $T-1$ (time iteration) terms of a border dummy that takes the value one if the bilateral trade flow is between different countries and for a given year.[17] T is the total number of years available in the sample and the border dummy itself is not included in the regression because it is a non-time-varying characteristic captured by the country-pair fixed effects. All the $B_{ij,t}$ terms account for average (across all pairs of different countries) changes in unobservable bilateral (fixed and variable) export costs, that are not associated with FTAs.

Also note that with the inclusion of intra-national trade flows, international trade barriers' effects are measured relative to intra-national trade flows. This leads us to wonder about the nature of the trade barriers included in the border effect, and what factors could have led to its change. ICT advances are arguably behind the fragmentation of production across countries by allowing to move ideas across countries, leading to an increasing importance of intermediate goods in international trade. Nevertheless, Baldwin (2016) does not consider the potentially different effect of ICT advances on trade in final and intermediate goods.

While exported final goods are produced or designed to be consumed, intermediate goods are designed to be part of further production processes that might require certain specificities and more importantly, a certain degree of coordination between the different stages of production. Therefore, we conjecture that while we should expect a positive effect of a reduction in the border effect on both types of trade, final goods could have benefited more from the same reductions at the bilateral level.

[17] The border dummy for the first year of the sample is always omitted.

As explained in the motivation section, this is not in contradiction with the well-known expansion of global value chains, since the effect of FTAs and the border effect reduction is expected to be positive for both final goods and intermediate inputs.

To capture the potential different effect from reduction in trade frictions on final goods and intermediate inputs, we also include the $T-1$ interaction of the border-time dummies with a intermediate good dummy, $Input_{i \neq j}$, as we did with the FTA indicator to capture the other potentially different effect on intermediate goods from FTAs.

3 Data

3.1 Global Input-Output Tables

Differentiating between final and intermediate goods, as well as international and intra-national trade demands the use of specific data. This delineation is something natural in the international input-output tables that have been made available by different sources (see for instance initiatives like WIOD, OECD-TiVA and EORA). Unfortunately, the time coverage of these data often starts in the mid-1990s and is thus too limited to capture the long-term factors we are interested in. Therefore, we need input-output tables covering a longer period.

Fortunately, Johnson and Noguera (2017) have constructed a database of input-output tables covering the 1970-2009 period. Their data construction effort is distinguished from related work in that they provide a long historical perspective on the rise of global supply chains by covering a long period and with broad a country scope, 43 countries reduced to 37 after dropping Check Republic, Estonia, Russia, Slovakia and Slovenia.[18] Our sample size is similar to studies like Bergstrand et al. (2015), with the difference that they cover the period 1990-2002 and we focus on the period 1970-2009. Given that we build on the existing literature, we also replicate several results in the literature before proceeding to address our research questions

[18] These countries are dropped due to not being covered over the whole period. The RoW region is also dropped.

for comparability and consistency.

Note that the long and comprehensive panel dimension of this data is key for our purpose of identifying the timing of the reductions in trade barriers that have been driving the expansion of global trade and global value chains.[19] The Input-Output tables also track trade between as well as within countries, so that we have access to both international and intra-national trade flows, which is essential to estimate structural gravity equations and to examine the specific border effects we interested in.

3.2 Economic Integration Agreements

We use data on economic integration agreements assembled by Scott Baier and Jeffrey Bergstrand, covering the 1960-2009 period.[20] This database is designed to allow users to quickly sort, file, and use information regarding the economic integration of bilateral country pairings. Table (1) shows the Economic Integration Agreements classification. We follow the literature in the way to define a FTA for comparison purposes. Therefore, a FTA is defined as an economic integration agreement in which trade barriers are eliminated (or substantially so) among members, and where non-members are treated differently. Our FTA indicator, therefore, takes the value one if a country pair has a FTA or stronger economic agreement, similar to the literature.[21] Also note that since our trade data ends in 2009, only FTA's that been in place 10 or more years before 2009 are included. The literature has shown that Preferential trade agreements have a less significant (if any) effect on bilateral trade.

Later in this paper when we explore the evolution of the trade effect of FTAs, we will disentangle the intra-EU effect from the average FTA. Therefore, it is important to remember that most agreements in categories 4, 5 and 6 are those among EU members.

[19]Remember that we focus on trade in the manufacturing sector.

[20]This database is available in "https://www3.nd.edu/ jbergstr/#Links". We use the September 2015 revision.

[21]See Baier and Bergstrand (2007) and the subsequent literature.

Table 1: Economic Integration Agreements

IIA Ranking	Type of Agreement	Type of Agreement	Definition
1	NR-PTA	Non Reciprocal Preferential Trade Arrangement	Preferential terms and customs concessions given by developed nations to developing countries
2	PTA	Preferential Trade Arrangement	Preferential terms to members vs non-members
3	FTA	Free Trade Areas	Trade barriers eliminated (or substantially so) among members; treat non-members differently
4	CU	Customs Union	Same as FTA; but treat non-members the same
5	CM	Common Market	Same as CU; but also includes free movement of labor/capital
6	EUN	Economic union	Same as CM, but also monetary and Fiscal Policy coordination; further harmonization of taxes/regulation/monetary system

4 Results

4.1 Impact of reduced border effects

We start by presenting our estimates of the trade enhancing role of reduced border effects per year from 1970 in Table (2). These estimates control for exporter-year, importer-year and country-pair fixed effects, as well as FTAs. We will return to the trade effect of FTAs later in this section. Column 1 shows that the reduction of border effects had increased total manufacturing exports by 278% $[e^{1.334} - 1]$ relative to domestic sales by 2009. This means that the cost of a national border has decreased by around 10% per year (100 x $[1-(1/e^{1.334})^{1/12}]$). This is a large effect. Our estimate is about four times higher than Bergstrand et al. (2015) who find that the cost of a national border has decreased by 2.5% per year from 1990 to 2002. The difference in our two estimates is mainly due to different samples and datasets, but also relate to the fact that they only captured the period when the "second unbundling" of globalization was already well under way.

When we estimate the regressions of Bergstrand et al. (2015) with their dataset and with the countries where our samples coincide[22], we find reduced border effects that has increased manufacturing trade by 30% $[e^{0.256} - 1]$ between 1990-2002, or by 2.1% per year, see Table (3). Using our dataset, only the period 1990-2002 and the

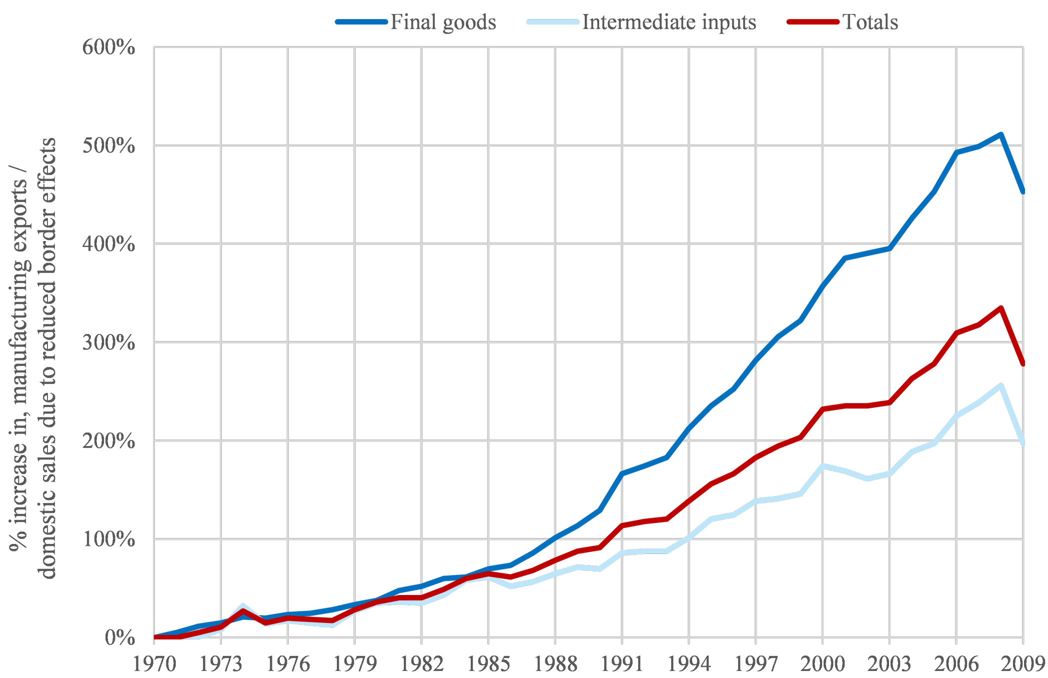
[22]The countries where the two datasets coincide are Argentina, Australia, Austria, Brazil, Canada, Switzerland, Chile, China, Germany, Denmark, Spain, Finland, France, Greece, Hungary, Ireland, Israel, Italy, Japan, Korea, Mexico, Netherlands, Norway, Poland, Portugal, Romania, Sweden, Turkey, the United Kingdom and United States

same sample of countries as above puts the border effect at 69% $[e^{0.523}-1]$ or 4.3% per year.[23]

This difference illustrates some of the uncertainty with the magnitude of the estimates of the border effect, which seems to be driven by developments in the underlying data, but also the need to capture longer periods to properly estimate the effect of reduced border effects on international trade.

The result for total goods exports does not differentiate between final goods or intermediate inputs. The evolution of the border effect - and the reduction of international trade costs it entails - could potentially have had a differential effect on these different types of goods over time (Zylkin, 2015).

Figure 2: Reduced border effects for total exports, final goods and intermediate inputs



Column 2 and 3 in Table (2) show a different evolution of the border effect for final goods and intermediate inputs. Figure (2) show graphically that from around

[23]Similarly, we find an average FTA effect of 83% $[e^{0.607}-1]$ that is higher then when using their dataset, which puts it at 68% $[e^{0.520}-1]$. Bergstrand et al. (2015) collects their data from CEPII TradeProd and United Nations COMTRADE for exports data whereas domestic sales come from UNIDO Industrial Statistics database and the CEPII TradeProd database as a secondary source.

1985 we observe a stronger effect on final goods than on intermediate inputs. By the end of the sample in 2009, diminished border effects are estimated to have expanded exports of final manufacturing goods by 453% [$e^{1.714} - 1$] relative to domestic final goods sales, while the rise of intermediate inputs had been 197% [$e^{1.093} - 1$]. The cost of a national border for final goods has thus decreased by 13% per year since 1970 (100 x [$1 - (1/e^{1.714})^{1/12}$]), whereas the decline has been 8% for intermediate inputs and (100 x [$1 - (1/e^{1.093})^{1/12}$]).

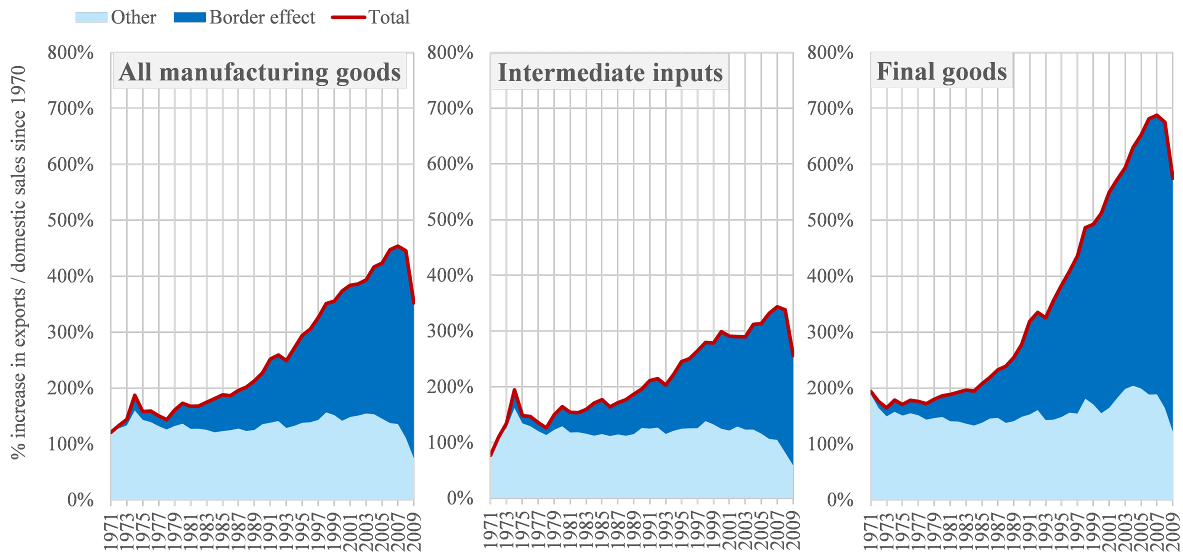
To gauge the relative importance of reduced border effects and other factors on the rise in international trade, we first compute the average rise since 1970 in the ratio of manufacturing exports over domestic manufacturing sales, see Figure (3). For total manufacturing exports relative to domestic manufacturing sales, the increase in exports in 2009 was about 3.5 times the increase in domestic sales since 1970. For final goods, it was almost 6 times and for intermediate inputs around 2.5 times. Then, we utilise our estimates from Table (2) to retrieve the impact of the border effect. The difference between the increase in the ratio and the border effect is "Other" factors. This would include the signing of FTAs, comparative advantage terms, relative prices, multilateral resistance terms and all other factors embodied in exporter-year and importer-year (e.g. changes in GDP in the origin and destination economy) and country-pair fixed effects.

This gives some sense of the magnitudes of the different factors traditionally thought to have driven the rise in global trade (Mussa 2000 and Baldwin 2016). Although trade policy (as captured by our FTA variable) has clearly stimulated international trade, other factors embodied in the concept of a border effect seem to be quantitatively much more important.

4.2 Explaining the different border effects

Why have diminished border effects led to a smaller increase in international trade in intermediate inputs than in final goods? This is arguably related to the fact that these two types of goods are different in nature. While final goods are produced to be consumed, intermediates are designed to be further processed in subsequent

Figure 3: Rise of international trade in manufacturing goods



Note: The chart utilises the estimates from Table (2) which includes export-year, importer-year and country-pair fixed effects and controls for whether two countries have an FTA or not. The border effect is defined as a dummy which equals zero if trade is within a country and one if trade is between two countries. It is interacted with year-dummies (where 1970 equals zero).

production processes. Therefore, intermediate inputs require more coordination in production and are thus *less* impacted by reduced trade costs than final goods that bear the full cost of previous steps in production.[24]

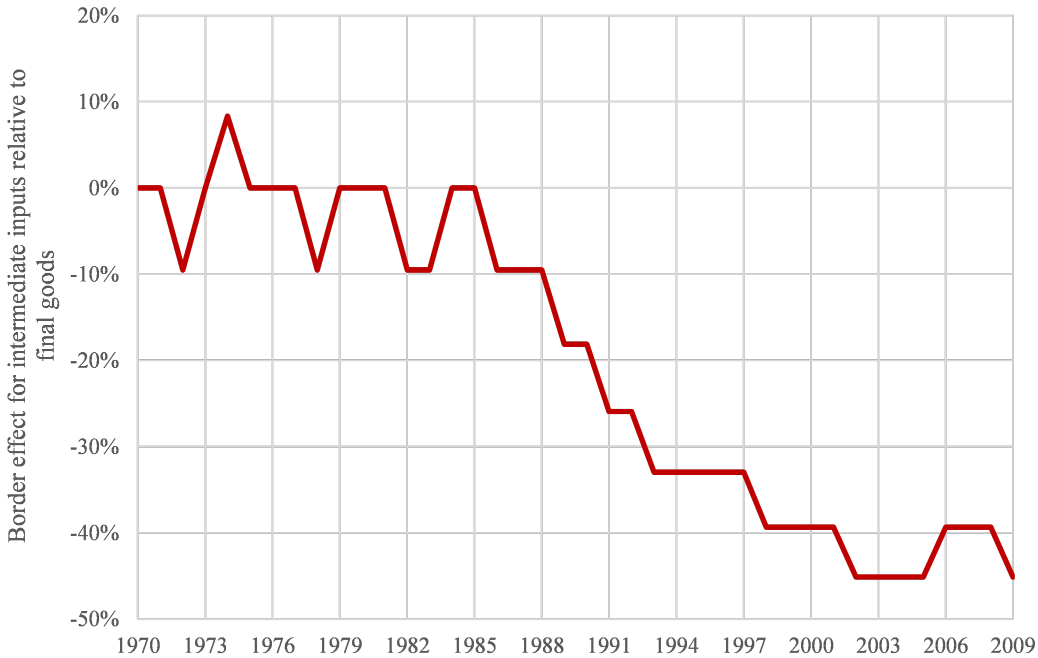
The greater impact of lower trade costs on final goods than intermediate inputs is also found by Antras and Chor (2018). It is not inconsistent with the emergence of international supply chains, since these results show that intermediate goods have been increasingly traded, generating production linkages across countries. It is, we believe, merely a reflection of final goods consisting of an increasingly complex chain of intermediate inputs and is in line with the reasoning of for example Yi (2010).

Figure (2) graphically illustrates the impact of decreasing border effects on final goods and intermediate inputs when estimated in different regressions. Nevertheless,

[24]Rouzet and Miroudot (2013) show that tariffs and other trade costs cumulate and that even small trade costs can have adverse consequences when inputs are part of complex value chains that finally constitute final products.

it does not precisely show the period in which these differences take place. Figure (4) therefore plots the impact of the reduced border effect on intermediate goods obtained from the regression using trade in final goods and intermediate inputs in the same estimation. From this figure, we see that the evolution of the border effect is not different until the mid-1980s when it starts to be greater for the final goods. From then and until the beginning of the 2000s, the reduction of trade frictions (other than those lowered by FTAs) stimulated final goods much more strongly. From the beginning of the 2000s and onward, the reduction in the border effect has once again affected final goods and intermediate inputs to the same extent.

Figure 4: Different border effect for final goods and intermediate inputs



It is particularly interesting that this different border effect coincides with the Information and Communication (ICT) revolution that allowed the emergence of global value chains. The ability to send ideas down cables for almost no cost to almost anywhere triggered a host of reformations in work practices, management practices, and relationships among firms and their suppliers and customers (Baldwin, 2016).

Working methods and product designs shifted to make production more modular and thus easier to coordinate at distance. The Telecom and Internet revolutions triggered a suite of information management innovations that made it easier, cheaper, faster, and safer to coordinate separate complex activities spatially. Email, editable files, and more specialized web-based coordination software packages revolutionized people's ability to manage multifaceted procedures across great distances. While the steam revolution took decades to transform globalization, the ICT revolution took years.

Baldwin (2016) show that there was an inflection point of growth in internet hosts and in telephone subscribers that occurred somewhere between 1985 and 1995. These historical facts perfectly match our results in which since 1985 and until the early 2000s, the reduction in the border effect not only stimulated trade but stimulated more final goods than intermediate goods. For us, this reflects the different nature of the two types of goods and is arguably justified by the ICT revolution. Note that the ICT revolution that made easier to coordinate separate complex activities spatially also made easier to sell final goods all over the world. And the empirical evidence points towards a larger effect on final than intermediate goods.

The ICT revolution was however not the only significant change in the time frame we cover Baldwin (2016). Continuous technological improvements in ships, trains, and trucks reduced the cost of moving goods, but failed to overcome the age-old problem of loading and unloading. A big breakthrough on this front came in the 1960s and grew exponentially in the 1970s and 1980s with the "containerization". Also, the development of air cargo stimulated the development of international production networks. Air freight first became commercially viable, but it did not really get going until the mid-1980s with the rise of international logistics firms. Indeed, the development of reliable air cargo services mirrors the rise of global value chains for rather obvious reasons.

Air cargo allowed manufacturers to know that intermediate goods could flow among distant factories almost as surely as they flow among factories within a nation. Hummels and Schaur (2013) show that fully 40 percent of the parts and components imported into the United States are imported by air. They model exporters' choice between fast, expensive air cargo and slow, cheap ocean cargo, which depends on the price elasticity of demand and the value that consumers attach to fast delivery. The key here is not the cost. While air shipments have been getting cheaper, air cargo even today is many times more expensive than sea freight. The critical attraction of sending things by air is speed. European freight sent by sea, for example, takes an average of twenty days to reach U.S. ports and a month to reach Japan. Air shipments take a day or less.

With the basic facts and timing of the ICT revolution and air cargo developments in hand, we have turned to the quantitative impact that these changes likely brought by making a careful use of the border effect and by distinguishing between final and intermediate goods. Lowering the trade barriers embodied in the border effect concept have likely less to do with traditional trade policies and more to do with productivity enhancing technological innovations that allows goods, tasks and services to flow more freely across borders.

4.3 Impact of FTAs when controlling for border effects

We proceed by presenting our empirical estimates for the trade-enhancing effect of FTAs and how they are affected when we control for border effects. Column 1-3 in Table (4) shows the results from the estimation considering total trade flows. Columns 4 to 7 show the results using data for both final and intermediate goods, which doubles the sample size. For each of the two specifications, we first omit domestic trade flows, then introduce them, but without controlling for the border effect. Lastly, we control for the border effect. Also note that we include lagged effects of the FTAs of up to 10 years, with the 10-year lag indicating 10 years or more after the introduction of the FTA between the country pair.

The results point to large gains to international trade from FTA's: a 54% $[e^{0.434} - 1]$ increase in bilateral trade over 10 years in our preferred specification in column 7. There are only minor differences between the estimation with total trade and the one with trade in final and intermediate goods as seen in columns 3 and 7. Nevertheless, the estimation differentiating trade in final and intermediate goods yield some additional interesting results: (i) the FTA effect is larger when one also considers domestic trade flows. This clarifies the need to include the domestic sales in gravity equations.

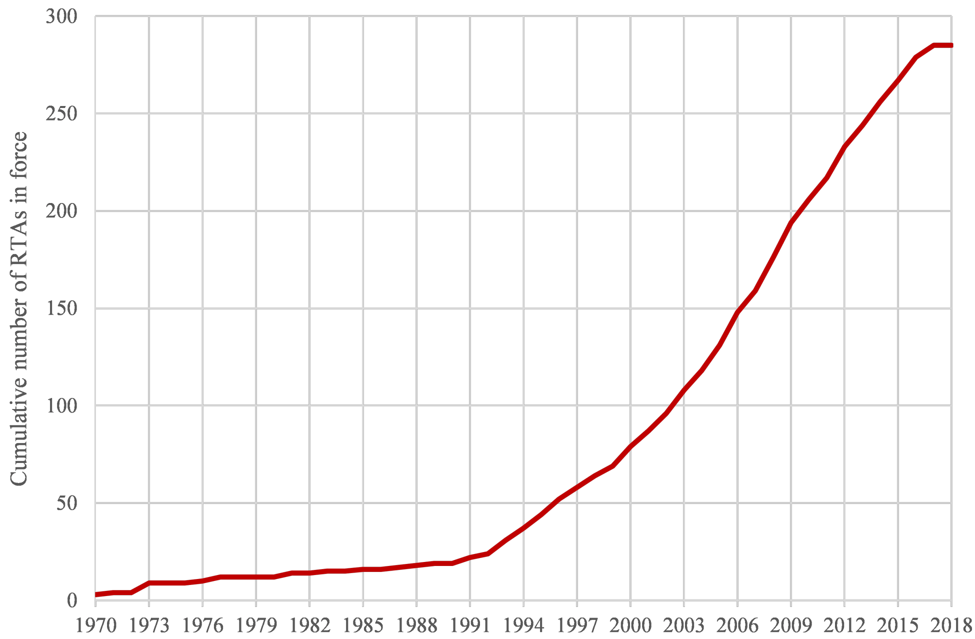
When these trade flows are considered, but we do not control for the border effect, the impact of FTAs is 362% $[e^{1.531} - 1]$ increase in bilateral trade. (ii) Once one controls for the border effect, the coefficient returns to a more feasible level of 95% $[e^{0.667} - 1]$, pointing towards the fact that FTAs and other factors embodied in the border effect also affect international trade and are correlated with the FTAs. If one does not control for the border effect, the impact of FTAs is overestimated. Bergstrand et al. (2015) show these same results, but without reporting the impact of FTAs without including the intra-national trade flows.

We think this is important because it is not about an overestimation of the effect as Bergstrand et al. (2015) conclude, but about the need to properly control for the border effect once intra-national trade flows are included. Finally, it turns out that one needs to control for a different border effect for final goods and intermediate inputs (comparing columns 6 and 7). With such different border effects, the FTA impact is further reduced to the 54% $[e^{0.434} - 1]$ increase in bilateral trade we find most plausible. This shows that the different factors that are affecting international and intra-national trade are also having a different effect for the two types of goods (finals and intermediates), whereas the effect of FTAs is not different for final goods and intermediate inputs when we use the whole 1970-2009 sample.

4.4 The evolution of the FTA-effect

An important change in the international trade system took place when GATT members launched the Uruguay Round in 1986, the same year that some of the leading GATT members also started massive regional trade liberalization initiatives (Martin and Messerlin, 2007). Specifically, three liberalization initiatives were launched in 1986. The United States and Canada started talks on a free trade agreement that finished in 1989 (this eventually turned into the North American Free Trade Agreement also encompassing Mexico or NAFTA). The year 1986 also saw Europe both deepen and widen trade liberalization, which was by then called the European Union (EU). Spain and Portugal were admitted as new members, and the EU embarked on a deep liberalization of many other economic barriers in the context of the Single Market program.

The Uruguay Round lasted from 1986 to 1994. As Figure (5) shows, there was an inflection point around these years in the number of free trade agreements in the global economy. These reductions were the beginning of a revolution in the attitudes of developing nations to increase trade.



Source: WTO.

Figure 5: Cumulative number of RTAs in force in the GATT/WTO

GATT's early multilateral negotiations ("rounds") dealt mostly with new rules and the admission of new members. From the Kennedy Round onward, the rounds returned to tariff cutting, but also touched on increasingly complex trade barriers — things like technical barriers to trade, investment rules, government purchases, and the like. The GATT was quite successful at lowering the tariffs of Japan, Europe, and North America, but developing nations could keep their tariffs high under a provision called "Special and Differential Treatment" that was aimed at allowing poor nations to industrialize behind tariff walls. As part of the Uruguay Round final agreement, the GATT became the WTO in 1995. Apart from changing the name, the deal institutionalized the GATT's judicial role in dispute settlement and added some basic rules for international investment, regulations, intellectual property, and services.

Since the 1980s turned out to be particularly important for trade liberalization initiatives and that the depth and content of FTAs might be different in more recent agreements and had a greater trade effect, we "roll" the estimations by dropping the starting year of the sample and keeping the end year always in 2009. This means that we identify the effect of only those FTAs signed after the starting year. Table (5) shows the results for the estimations with starting years between 1970 until 1997. We see two important results: (i) The FTA-effect seems to have strengthened over time. In 1970, the effect is 54% $[e^{0.434} - 1]$ as mentioned before, and it gradually increases up to an effect of 97% $[e^{0.678} - 1]$. This is in line with the idea that new FTAs have evolved by deepening trade integration. footnoteNote that the FTA's effect is estimated only with the new FTAs signed after the starting year. They are comparable thanks to the high dimensional fixed effects included. See the empirical approach section for more details. Additionally, it seems that there is a significantly smaller effect of FTA on trade in intermediate goods towards the end of the sample (the mid-1990s).

4.5 The strengthened impact of FTAs

To get further insights into the trend of a stronger impact of FTAs, we focus on the intra-EU effect. The reason for this is that the European Union has pursued deeper integration since its first steps and it could be the main driver of the observed evolution. The year 1986 was a particularly important year for initiatives liberalizing trade. Europe both deepened and widened its pan-European economic integration within the European Union (EU). Spain and Portugal were admitted as new members and the EU embarked on the reduction of many other economic barriers in the context of the Single Market program (see for instance Mongelli et al. (2005) on the different stages of integration). Now that EU-membership is being renegotiated in the context of 'Brexit', it is interesting to see what the average trade effect of joining the EU might be.

We apply our general methodology to capture the potentially different trade effect of the European Union (EU) compared to the average FTA-effect. We define a dummy variable for the EU in the same way as the FTA variable. It takes value 1 when the bilateral trade flow is between two EU countries. This variable thus captures the additional effect of the EU on bilateral intra-EU trade.

The results capture several important insights: (i) The EU has a larger effect on bilateral trade, beyond that of the average FTA effect. (ii) By 1994 however, the difference between the EU's effect and the average FTA-effect has become smaller. At the same time, the effect of average FTAs has increased strongly, meaning that the total EU-effect has also increased over time. The previous result of a larger effect of FTAs on trade in intermediate goods towards the end of the sample is also present in these results. Nevertheless, for the intra-EU trade, this difference is already significant since the beginning of the 1970s.

5 Robustness checks

5.1 The role of HDFEs

Since the contribution of Baier and Bergstrand (2007) the gravity literature estimates of the effect of trade barriers on bilateral trade includes country-pair fixed effects. They used a log-linear OLS, but after Silva and Tenreyro (2006)'s work, the PPML estimator became the benchmark, as we explained before. Nevertheless, for large samples, computational issues have limited the choice of the estimator, forcing researchers to use the log-linear OLS or the PPML without country-pair fixed effects. More recently, Larch et al. (2017) have addressed this gap, unveiling an iterative PPML estimator, which flexibly accounts for multilateral resistance, pair-specific heterogeneity, and correlated errors.

This has opened the door to the use of High-Dimensional Fixed Effects (HDFE) in PPML estimations. This implies that more robust and unbiased estimate can be obtained. Nevertheless, this might raise the question of whether there is an "overfitting problem".[25] In PPML there is not an equivalent way to obtain a measure of the goodness of fit of a model as the R^2 in OLS, and that is why it is not usually reported in the literature using the PPML estimator. Although, there exists a pseudo-R^2 for PPML computed as the square of the correlation between the dependable variable and the fitted values. Introducing the different set of fixed effects one by one and reporting this pseudo-R^2 provides two important insights: (i) an approximation of the goodness of fit of the model, (ii) an approximation to an analysis of variance (ANOVA). Rather than allowing to partition the observed variance in the dependent variable into the different explanatory variables and fixed effects, we can only compute the pseudo-R^2 when the different sets of variables are included in the estimation. Results are reported in table (7).

So far we have estimated the impact of border effects and FTAs on trade with asymmetric country-pair fixed effects. Therefore, one basic exercise we can do to reduce the number of fixed effects included is to estimate this effect with symmetric country-pair fixed effects. This cuts the number of country-pair fixed effects roughly in half. An over-fitting bias in fixed effects estimations generally creates a problem by yielding standard errors that are too small. Given that the degree of precision is roughly the same (see columns 1 and 2), we conclude that it is unlikely that our estimates suffer from an over-fitting issue.

5.2 More robust standard errors

Note that so far in this paper, results have been reported with standard errors clustered by exporter and importer, in line with the literature. Nevertheless, we think it is also important to consider the potential correlation of errors across time. There, we now cluster errors by exporter-importer-year. Table (8) reports the same results

[25] Note that the only set of fixed effects that is not included is the country-pair-time effect since it is the dimension at which the FTA effect is estimated.

as in table (4), showing that our results are robust to this specification. If any, table (8) shows that the differential effect of FTAs in trade in intermediate goods emerges at the end of the period.

5.3 Working with data in 5-year intervals

The trade literature estimating the impact of FTA's has usually followed the recommendation of Cheng and J.Wall (2005) to use data in intervals of three to five years. To make sure that our results are comparable with those in the literature, we report the previous results using data in 5-year intervals. Table (9) reports the results for the full sample 1970-2009, in which the intra-national trade flows and the control for border effect as progressively introduced, and the result for the rolling starting year respectively. Table (10) reports the "rolling" estimation on the initial year of the sample. Finally, table (11) reports the results disentangling the intra-EU trade effect from the average FTA.

We find that our results hold and maintain our conclusions. Moreover, when using 5-year intervals the interpretation of the coefficients is less precise due to the time-windows. There is no clear reason to drop a large number of observations now that efficient PPML algorithms are available.

6 Concluding remarks

Reductions in trade barriers over the past decades have been made possible through the implementation of Free Trade Agreements (FTAs) and technological progress, which in turn have greatly stimulated international trade. In this paper, we examined the role reduced trade barriers from two dimensions: (i) the implementation of FTAs and (ii) diminishing border effects. Our results show that the latter factor have significantly expanded trade in the manufacturing sector and accounts, according to our estimates, for the bulk of the increase in international trade in manufacturing goods from the 1970s. The cost of national border have according to our estimates fallen by around 10% per year for total manufacturing goods exports.

Diminished border effects has had a greater impact on final products than intermediate inputs. For final goods, the increase has been an astounding 453%, relative to domestic sales since 1970 compared to a 197% rise for intermediate inputs. This represents a reduction in the cost of a national border of 13% per year for final goods and 8% for intermediate inputs.

We argue that this differential impact is related to the fact that final goods and intermediates inputs are different in nature. While final goods are produced to be consumed, intermediates inputs are designed to be further processed in subsequent production processes. Therefore, intermediate inputs require more coordination in production and are thus less impacted by reduced trade costs embodied in the border effect than final goods that bear the full cost of previous steps in production. These results give some indication as to how important reductions in border effects has been for international trade and for the emergence of global value chains.

We have also observed a strengthening effect of FTAs over time. Therefore, we have focused on the trade effect of specific institutional arrangements such as the European Union. With it, we have shown implicitly what could be the trade effect of leaving such an agreement. Joining the EU has had a significant additional effect on intra-EU trade among its member states: it more than doubles the effect of an average FTA, when we consider the whole sample. Future research should take care of further clarifying the strengthening effect of FTA over time and the difference between final and intermediate goods.

We conjecture that the greater trade impact of FTAs on final goods, after disentangling the intra-EU effect, is related to the fact that developing countries became more important in intermediate goods trade over the time period in question. This is something we plan to study more in detail in future research. It would also be interesting to further clarify the interaction between reductions of the border effect and FTAs. One could arguably anticipate that FTAs allowed international trade to expand, and global value chains to emerge, by the setting the rules that govern international commerce (Blanchard et al., 2016).

Another interesting avenue for future research would be to see how reductions of the border effect and introduction of FTAs interact with the decline in manufacturing employment in some developed economies to give some insight into the role of technological and trade related displacement of employment.

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	(1) Totals	(2) Final	(3) Intermediate
1971	0.007	0.056***	-0.021***
	(0.006)	(0.007)	(0.007)
1975	0.144***	0.181***	0.132***
	(0.020)	(0.023)	(0.019)
1980	0.310***	0.329***	0.307***
	(0.020)	(0.023)	(0.022)
1985	0.502***	0.536***	0.480***
	(0.032)	(0.033)	(0.036)
1990	0.650***	0.832***	0.539***
	(0.029)	(0.036)	(0.031)
1995	0.948***	1.218***	0.796***
	(0.034)	(0.047)	(0.033)
2000	1.209***	1.524***	1.018***
	(0.041)	(0.059)	(0.042)
2005	1.334***	1.712***	1.099***
	(0.053)	(0.074)	(0.051)
2009	1.334***	1.714***	1.093***
	(0.056)	(0.083)	(0.049)
Observations	49000	49000	49000
Control for FTAs	Yes	Yes	Yes

Note: *, **, and *** denote $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively. Standard errors clustered by exporter-importer, are reported in parentheses. The years denote the border effect on international exports, relative to domestic sales for each year relative to 1970.

Table 2: Border effect (1970-2009)

	(1) Bergstrand et al., (2015)	(2) This paper
1994	0.061***	0.213***
	(0.022)	(0.017)
1995		0.282***
		(0.016)
1996		0.315***
		(0.019)
1997		0.380***
		(0.020)
1998	0.262***	0.406***
	(0.035)	(0.021)
1999		0.439***
		(0.024)
2000		0.532***
		(0.026)
2001		0.523***
		(0.033)
2001		0.523***
		(0.033)
2002	0.259***	0.523***
	(0.068)	(0.033)
Observations	3600	10023
Control for FTAs	Yes	Yes
Intervals	Yes	No

Note: *, **, and *** denote $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively. Standard errors clustered by exporter-importer, are reported in parentheses.

Table 3: Comparing border effects with Bergstrand et al., (2015)

	(1) Total	(2) Total	(3) Total	(4) Both	(5) Both	(6) Both	(7) Both
FTA lag 0	0.083**	0.440***	0.174***	0.071	0.554***	0.277***	0.193**
	(0.033)	(0.075)	(0.067)	(0.045)	(0.096)	(0.085)	(0.080)
FTA lag 1	0.129***	0.544***	0.236***	0.119**	0.645***	0.325***	0.238**
	(0.036)	(0.101)	(0.087)	(0.051)	(0.113)	(0.096)	(0.098)
FTA lag 2	0.140***	0.607***	0.254**	0.141***	0.741***	0.374***	0.263**
	(0.040)	(0.108)	(0.103)	(0.055)	(0.114)	(0.106)	(0.109)
FTA lag 3	0.185***	0.686***	0.294***	0.181***	0.837***	0.431***	0.311***
	(0.039)	(0.107)	(0.096)	(0.054)	(0.113)	(0.099)	(0.103)
FTA lag 4	0.206***	0.761***	0.350***	0.203***	0.933***	0.509***	0.372***
	(0.040)	(0.106)	(0.092)	(0.055)	(0.111)	(0.094)	(0.097)
FTA lag 5	0.223***	0.839***	0.389***	0.226***	1.023***	0.559***	0.408***
	(0.043)	(0.107)	(0.098)	(0.057)	(0.104)	(0.091)	(0.094)
FTA lag 6	0.244***	0.910***	0.409***	0.250***	1.097***	0.585***	0.440***
	(0.044)	(0.115)	(0.105)	(0.058)	(0.110)	(0.096)	(0.101)
FTA lag 7	0.261***	0.914***	0.394***	0.265***	1.112***	0.582***	0.425***
	(0.046)	(0.104)	(0.098)	(0.060)	(0.102)	(0.092)	(0.096)
FTA lag 8	0.265***	0.979***	0.411***	0.251***	1.182***	0.603***	0.432***
	(0.049)	(0.096)	(0.098)	(0.065)	(0.094)	(0.092)	(0.096)
FTA lag 9	0.288***	1.024***	0.427***	0.272***	1.220***	0.612***	0.430***
	(0.051)	(0.094)	(0.097)	(0.069)	(0.090)	(0.090)	(0.099)
FTA lag 10 +	0.312***	1.248***	0.385***	0.292***	1.531***	0.667***	0.434***
	(0.055)	(0.123)	(0.129)	(0.071)	(0.119)	(0.121)	(0.131)
Input FTA lag 0				0.009	-0.191***	-0.183***	-0.035
				(0.036)	(0.041)	(0.035)	(0.030)
Input FTA lag 1				-0.003	-0.180***	-0.173***	-0.019
				(0.040)	(0.035)	(0.026)	(0.033)
Input FTA lag 2				-0.022	-0.243***	-0.236***	-0.039
				(0.040)	(0.034)	(0.022)	(0.033)
Input FTA lag 3				-0.016	-0.270***	-0.264***	-0.051
				(0.042)	(0.035)	(0.024)	(0.033)
Input FTA lag 4				-0.023	-0.308***	-0.303***	-0.059*
				(0.044)	(0.034)	(0.023)	(0.031)
Input FTA lag 5				-0.038	-0.331***	-0.330***	-0.060*
				(0.046)	(0.032)	(0.023)	(0.033)
Input FTA lag 6				-0.046	-0.341***	-0.343***	-0.084**
				(0.046)	(0.037)	(0.026)	(0.035)
Input FTA lag 7				-0.045	-0.355***	-0.359***	-0.080**
				(0.048)	(0.034)	(0.026)	(0.037)
Input FTA lag 8				-0.011	-0.361***	-0.367***	-0.062
				(0.049)	(0.033)	(0.025)	(0.041)
Input FTA lag 9				-0.014	-0.349***	-0.356***	-0.030
				(0.051)	(0.035)	(0.028)	(0.045)
Input FTA lag 10 +				0.004	-0.485***	-0.516***	-0.099*
				(0.052)	(0.046)	(0.037)	(0.052)
Observations	47520	49000	49000	95040	98000	98000	98000
Domestic trade flows	No	Yes	Yes	No	Yes	Yes	Yes
Control for border		No	Yes		No	Yes	Yes
Control for border-inputs					No	No	Yes

Note: *, **, and *** denote p < 0.10, p < 0.05, and p < 0.01, respectively. Standard errors clustered by exporter-importer, are reported in parentheses.

Table 4: FTA's Effect on bilateral trade (1970-2009)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	1970	1973	1976	1979	1982	1985	1988	1991	1994	1997
FTA lag 0	0.193**	0.205***	0.217***	0.222***	0.220***	0.228***	0.308***	0.170***	0.277***	0.105*
	(0.080)	(0.078)	(0.076)	(0.076)	(0.070)	(0.055)	(0.030)	(0.030)	(0.047)	(0.061)
FTA lag 1	0.238**	0.254***	0.266***	0.272***	0.272***	0.281***	0.367***	0.271***	0.320***	0.226**
	(0.098)	(0.098)	(0.096)	(0.095)	(0.090)	(0.074)	(0.032)	(0.040)	(0.052)	(0.108)
FTA lag 2	0.263**	0.272**	0.284***	0.290***	0.290***	0.299***	0.389***	0.324***	0.351***	0.265***
	(0.109)	(0.109)	(0.108)	(0.107)	(0.102)	(0.087)	(0.044)	(0.042)	(0.054)	(0.094)
FTA lag 3	0.311***	0.319***	0.331***	0.336***	0.337***	0.346***	0.436***	0.354***	0.361***	0.347***
	(0.103)	(0.102)	(0.101)	(0.100)	(0.095)	(0.080)	(0.042)	(0.045)	(0.070)	(0.107)
FTA lag 4	0.372***	0.377***	0.390***	0.395***	0.397***	0.405***	0.514***	0.416***	0.374***	0.347***
	(0.097)	(0.095)	(0.094)	(0.093)	(0.089)	(0.074)	(0.039)	(0.045)	(0.066)	(0.106)
FTA lag 5	0.408***	0.417***	0.429***	0.435***	0.435***	0.444***	0.547***	0.446***	0.382***	0.428***
	(0.094)	(0.095)	(0.094)	(0.093)	(0.089)	(0.075)	(0.042)	(0.045)	(0.078)	(0.144)
FTA lag 6	0.440***	0.451***	0.464***	0.469***	0.469***	0.478***	0.584***	0.504***	0.394***	0.399***
	(0.101)	(0.100)	(0.098)	(0.098)	(0.094)	(0.081)	(0.049)	(0.044)	(0.080)	(0.151)
FTA lag 7	0.425***	0.440***	0.452***	0.458***	0.460***	0.469***	0.564***	0.481***	0.473***	0.515***
	(0.096)	(0.095)	(0.094)	(0.094)	(0.091)	(0.079)	(0.057)	(0.051)	(0.088)	(0.163)
FTA lag 8	0.432***	0.447***	0.460***	0.465***	0.467***	0.476***	0.562***	0.481***	0.536***	0.529***
	(0.096)	(0.096)	(0.095)	(0.096)	(0.093)	(0.084)	(0.069)	(0.066)	(0.101)	(0.189)
FTA lag 9	0.430***	0.438***	0.451***	0.457***	0.459***	0.468***	0.550***	0.475***	0.529***	0.612***
	(0.099)	(0.098)	(0.097)	(0.099)	(0.097)	(0.089)	(0.077)	(0.078)	(0.110)	(0.211)
FTA lag 10 +	0.434***	0.424***	0.437***	0.445***	0.456***	0.469***	0.473***	0.496***	0.536***	0.678***
	(0.131)	(0.134)	(0.134)	(0.135)	(0.134)	(0.125)	(0.100)	(0.105)	(0.115)	(0.216)
Input FTA lag 0	-0.035	-0.032	-0.045	-0.049	-0.048	-0.043	-0.024	-0.124***	-0.162***	-0.107*
	(0.030)	(0.032)	(0.032)	(0.031)	(0.030)	(0.027)	(0.031)	(0.025)	(0.040)	(0.061)
Input FTA lag 1	-0.019	-0.015	-0.025	-0.029	-0.026	-0.021	-0.001	-0.091***	-0.194***	-0.250**
	(0.033)	(0.034)	(0.034)	(0.033)	(0.032)	(0.029)	(0.032)	(0.029)	(0.050)	(0.107)
Input FTA lag 2	-0.039	-0.033	-0.042	-0.046	-0.043	-0.038	-0.017	-0.087**	-0.242***	-0.284***
	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.032)	(0.033)	(0.034)	(0.057)	(0.097)
Input FTA lag 3	-0.051	-0.047	-0.057*	-0.061*	-0.058*	-0.051	-0.039	-0.105***	-0.245***	-0.289***
	(0.033)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.035)	(0.040)	(0.072)	(0.105)
Input FTA lag 4	-0.059*	-0.055*	-0.064**	-0.068**	-0.065**	-0.057*	-0.053	-0.117***	-0.254***	-0.355***
	(0.031)	(0.032)	(0.032)	(0.032)	(0.033)	(0.034)	(0.035)	(0.038)	(0.063)	(0.092)
Input FTA lag 5	-0.060*	-0.055*	-0.064*	-0.068**	-0.064*	-0.057	-0.048	-0.072	-0.230***	-0.418***
	(0.033)	(0.033)	(0.033)	(0.034)	(0.036)	(0.041)	(0.042)	(0.044)	(0.081)	(0.134)
Input FTA lag 6	-0.084**	-0.084**	-0.093**	-0.097***	-0.092**	-0.084*	-0.084*	-0.090**	-0.214***	-0.350***
	(0.035)	(0.036)	(0.036)	(0.037)	(0.039)	(0.045)	(0.047)	(0.046)	(0.078)	(0.127)
Input FTA lag 7	-0.080**	-0.077**	-0.085**	-0.088**	-0.084**	-0.077*	-0.070	-0.091*	-0.234***	-0.402***
	(0.037)	(0.038)	(0.038)	(0.039)	(0.041)	(0.046)	(0.050)	(0.049)	(0.085)	(0.137)
Input FTA lag 8	-0.062	-0.059	-0.066	-0.069	-0.064	-0.057	-0.051	-0.066	-0.269***	-0.387***
	(0.041)	(0.042)	(0.043)	(0.044)	(0.046)	(0.053)	(0.058)	(0.060)	(0.087)	(0.147)
Input FTA lag 9	-0.030	-0.024	-0.031	-0.035	-0.030	-0.022	-0.012	-0.036	-0.279***	-0.409**
	(0.045)	(0.046)	(0.047)	(0.048)	(0.051)	(0.057)	(0.065)	(0.071)	(0.097)	(0.171)
Input FTA lag 10 +	-0.099*	-0.101*	-0.110**	-0.114**	-0.112*	-0.104*	-0.051	-0.051	-0.250**	-0.465***
	(0.052)	(0.053)	(0.054)	(0.055)	(0.057)	(0.063)	(0.066)	(0.067)	(0.105)	(0.180)
Observations	98000	90650	83300	75950	68600	61250	53900	46550	39200	31850

Note: *, **, and *** denote p < 0.10, p < 0.05, and p < 0.01, respectively. Standard errors clustered by exporter-importer, are reported in parentheses. The year in each column denotes the starting year in the sample.

Table 5: The FTA's effect evolution

	(1) 1970	(2) 1973	(3) 1976	(4) 1979	(5) 1982	(6) 1985	(7) 1988	(8) 1991	(9) 1994
FTA lag 10 +	0.270**	0.266**	0.277**	0.282**	0.292**	0.312***	0.323***	0.393***	0.565***
	(0.122)	(0.123)	(0.122)	(0.122)	(0.120)	(0.112)	(0.084)	(0.095)	(0.117)
Input FTA lag 10 +	-0.086*	-0.096*	-0.108**	-0.118**	-0.129**	-0.141**	-0.107	-0.100	-0.284***
	(0.049)	(0.050)	(0.051)	(0.053)	(0.056)	(0.065)	(0.075)	(0.077)	(0.108)
EU lag 10 +	0.354***	0.340***	0.335***	0.335***	0.335***	0.327***	0.246***	0.262***	0.285***
	(0.071)	(0.071)	(0.069)	(0.068)	(0.066)	(0.066)	(0.065)	(0.058)	(0.062)
Input EU lag 10 +	-0.215***	-0.232***	-0.234***	-0.241***	-0.254***	-0.260***	-0.249***	-0.277***	-0.339***
	(0.045)	(0.048)	(0.048)	(0.049)	(0.050)	(0.052)	(0.051)	(0.047)	(0.043)
Observations	90800	83990	77180	70370	63560	56750	49940	43130	36320

Note: *, **, and *** denote $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively. Standard errors clustered by exporter-importer, are reported in parentheses. The year in each column denotes the starting year in the sample. Out of the 40 lags included in the estimations, only the long-run effect of FTAs (10+ lag) is report due to space constraints.

Table 6: European Union effect on trade in finals and intermediates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
FTA lag 0	0.193**	0.190**	0.394			0.554***	0.749*
	(0.080)	(0.079)	(0.276)			(0.096)	(0.390)
FTA lag 1	0.238**	0.242**	0.420			0.645***	0.915**
	(0.098)	(0.096)	(0.263)			(0.113)	(0.385)
FTA lag 2	0.263**	0.268**	0.465*			0.741***	0.995***
	(0.109)	(0.107)	(0.257)			(0.114)	(0.378)
FTA lag 3	0.311***	0.316***	0.526**			0.837***	1.067***
	(0.103)	(0.101)	(0.255)			(0.113)	(0.379)
FTA lag 4	0.372***	0.376***	0.600**			0.933***	1.159***
	(0.097)	(0.095)	(0.251)			(0.111)	(0.390)
FTA lag 5	0.408***	0.413***	0.694***			1.023***	1.264***
	(0.094)	(0.093)	(0.246)			(0.104)	(0.396)
FTA lag 6	0.440***	0.445***	0.721***			1.097***	1.360***
	(0.101)	(0.099)	(0.244)			(0.110)	(0.390)
FTA lag 7	0.425***	0.433***	0.701***			1.112***	1.369***
	(0.096)	(0.095)	(0.240)			(0.102)	(0.384)
FTA lag 8	0.432***	0.438***	0.676***			1.181***	1.467***
	(0.097)	(0.095)	(0.240)			(0.094)	(0.387)
FTA lag 9	0.430***	0.436***	0.648***			1.220***	1.521***
	(0.099)	(0.098)	(0.230)			(0.090)	(0.383)
FTA lag 10+	0.435***	0.440***	0.168*			1.531***	2.303***
	(0.131)	(0.129)	(0.093)			(0.119)	(0.131)
Input FTA lag 0	-0.035	-0.030	-0.058			-0.191***	-0.203
	(0.030)	(0.028)	(0.405)			(0.041)	(0.559)
Input FTA lag 1	-0.019	-0.020	-0.069			-0.180***	-0.246
	(0.033)	(0.031)	(0.384)			(0.035)	(0.550)
Input FTA lag 2	-0.039	-0.041	-0.124			-0.243***	-0.298
	(0.033)	(0.031)	(0.377)			(0.034)	(0.540)
Input FTA lag 3	-0.051	-0.054*	-0.107			-0.270***	-0.273
	(0.033)	(0.032)	(0.369)			(0.035)	(0.543)
Input FTA lag 4	-0.059*	-0.062*	-0.134			-0.308***	-0.326
	(0.031)	(0.032)	(0.365)			(0.034)	(0.562)
Input FTA lag 5	-0.060*	-0.065*	-0.144			-0.331***	-0.341
	(0.033)	(0.035)	(0.359)			(0.032)	(0.564)
Input FTA lag 6	-0.085**	-0.091**	-0.140			-0.340***	-0.356
	(0.035)	(0.037)	(0.355)			(0.037)	(0.554)
Input FTA lag 7	-0.080**	-0.088**	-0.151			-0.355***	-0.345
	(0.037)	(0.039)	(0.349)			(0.034)	(0.540)
Input FTA lag 8	-0.062	-0.069	-0.149			-0.361***	-0.343
	(0.041)	(0.043)	(0.351)			(0.033)	(0.541)
Input FTA lag 9	-0.030	-0.038	-0.150			-0.348***	-0.354
	(0.045)	(0.047)	(0.339)			(0.035)	(0.536)
Input FTA lag 10+	-0.099*	-0.104**	-0.385***			-0.485***	-0.475**
	(0.052)	(0.053)	(0.133)			(0.046)	(0.190)
Pair FEs	Asym	Sym	No	Asym	No	Asym	No
Borders	Yes	Yes	Yes	Yes	Yes	No	No
Observations	98000	98000	98000	98000	98000	98000	98000
pseudo-R^2	1.000	1.000	0.991	1.000	0.991	0.999	0.356

Note: *, **, and *** denote p < 0.10, p < 0.05, and p < 0.01, respectively. Standard errors clustered by exporter-importer, are reported in parentheses. The pseudo-R^2 is reported as 1 when pseudo-$R^2 > 0.999$

Table 7: The role of HDFEs and pseudo-R^2 (1970-2009)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	1970	1973	1976	1979	1982	1985	1988	1991	1994	1997
FTA lag 0	0.193*	0.205**	0.217**	0.222**	0.220**	0.228**	0.309***	0.169	0.281***	0.105*
	(0.100)	(0.099)	(0.100)	(0.102)	(0.105)	(0.111)	(0.117)	(0.119)	(0.098)	(0.060)
FTA lag 1	0.238**	0.254**	0.266***	0.272***	0.272***	0.281***	0.367***	0.271**	0.323***	0.225***
	(0.103)	(0.100)	(0.100)	(0.102)	(0.104)	(0.104)	(0.099)	(0.131)	(0.052)	(0.034)
FTA lag 2	0.263**	0.272**	0.284***	0.290***	0.290***	0.299***	0.389***	0.324***	0.355***	0.265***
	(0.110)	(0.108)	(0.108)	(0.109)	(0.109)	(0.106)	(0.084)	(0.114)	(0.048)	(0.034)
FTA lag 3	0.311***	0.319***	0.330***	0.336***	0.337***	0.346***	0.437***	0.354***	0.364***	0.347***
	(0.104)	(0.100)	(0.099)	(0.099)	(0.097)	(0.090)	(0.081)	(0.110)	(0.048)	(0.021)
FTA lag 4	0.372***	0.377***	0.390***	0.395***	0.397***	0.405***	0.514***	0.415***	0.377***	0.347***
	(0.099)	(0.095)	(0.094)	(0.094)	(0.093)	(0.087)	(0.073)	(0.102)	(0.034)	(0.028)
FTA lag 5	0.408***	0.417***	0.429***	0.435***	0.435***	0.444***	0.547***	0.446***	0.385***	0.428***
	(0.103)	(0.101)	(0.100)	(0.101)	(0.101)	(0.098)	(0.085)	(0.098)	(0.032)	(0.037)
FTA lag 6	0.440***	0.451***	0.464***	0.469***	0.469***	0.478***	0.585***	0.504***	0.398***	0.399***
	(0.110)	(0.107)	(0.106)	(0.108)	(0.108)	(0.105)	(0.080)	(0.079)	(0.056)	(0.062)
FTA lag 7	0.425***	0.440***	0.452***	0.458***	0.460***	0.469***	0.564***	0.480***	0.477***	0.514***
	(0.112)	(0.108)	(0.108)	(0.110)	(0.110)	(0.107)	(0.084)	(0.061)	(0.069)	(0.106)
FTA lag 8	0.432***	0.447***	0.460***	0.465***	0.467***	0.476***	0.562***	0.480***	0.540***	0.529***
	(0.117)	(0.113)	(0.113)	(0.115)	(0.113)	(0.108)	(0.093)	(0.067)	(0.085)	(0.156)
FTA lag 9	0.430***	0.438***	0.451***	0.457***	0.459***	0.468***	0.550***	0.475***	0.533***	0.612***
	(0.124)	(0.120)	(0.121)	(0.122)	(0.120)	(0.115)	(0.099)	(0.069)	(0.075)	(0.158)
FTA lag 10+	0.435**	0.424**	0.437**	0.445**	0.456**	0.469***	0.473***	0.495***	0.541***	0.678***
	(0.184)	(0.182)	(0.182)	(0.182)	(0.179)	(0.168)	(0.139)	(0.106)	(0.094)	(0.184)
Input FTA lag 0	-0.035	-0.032	-0.045	-0.049	-0.048	-0.044	-0.025	-0.124*	-0.165***	-0.101**
	(0.050)	(0.051)	(0.052)	(0.052)	(0.052)	(0.055)	(0.072)	(0.065)	(0.057)	(0.049)
Input FTA lag 1	-0.019	-0.015	-0.025	-0.029	-0.026	-0.021	-0.001	-0.091	-0.197***	-0.244***
	(0.050)	(0.051)	(0.052)	(0.052)	(0.052)	(0.053)	(0.068)	(0.066)	(0.038)	(0.042)
Input FTA lag 2	-0.039	-0.033	-0.041	-0.046	-0.043	-0.038	-0.018	-0.087	-0.246***	-0.278***
	(0.049)	(0.048)	(0.048)	(0.049)	(0.050)	(0.051)	(0.061)	(0.066)	(0.055)	(0.096)
Input FTA lag 3	-0.051	-0.047	-0.056	-0.061	-0.058	-0.052	-0.040	-0.105	-0.249***	-0.283***
	(0.049)	(0.050)	(0.050)	(0.051)	(0.052)	(0.053)	(0.055)	(0.072)	(0.074)	(0.042)
Input FTA lag 4	-0.059	-0.055	-0.064	-0.068	-0.065	-0.058	-0.054	-0.117*	-0.257***	-0.349***
	(0.052)	(0.054)	(0.055)	(0.056)	(0.058)	(0.060)	(0.056)	(0.071)	(0.048)	(0.057)
Input FTA lag 5	-0.060	-0.055	-0.064	-0.068	-0.064	-0.058	-0.049	-0.072	-0.233**	-0.412***
	(0.052)	(0.055)	(0.056)	(0.058)	(0.061)	(0.064)	(0.050)	(0.072)	(0.095)	(0.022)
Input FTA lag 6	-0.085	-0.084	-0.093	-0.097	-0.092	-0.085	-0.084	-0.090	-0.217***	-0.343***
	(0.058)	(0.063)	(0.064)	(0.066)	(0.070)	(0.074)	(0.062)	(0.076)	(0.070)	(0.043)
Input FTA lag 7	-0.080	-0.077	-0.085	-0.088	-0.084	-0.077	-0.070	-0.091	-0.237***	-0.396***
	(0.056)	(0.063)	(0.063)	(0.065)	(0.068)	(0.071)	(0.060)	(0.078)	(0.091)	(0.102)
Input FTA lag 8	-0.062	-0.059	-0.066	-0.069	-0.064	-0.057	-0.051	-0.066	-0.272***	-0.381**
	(0.052)	(0.057)	(0.058)	(0.060)	(0.062)	(0.063)	(0.049)	(0.070)	(0.087)	(0.153)
Input FTA lag 9	-0.030	-0.024	-0.031	-0.035	-0.030	-0.022	-0.012	-0.036	-0.283***	-0.403**
	(0.051)	(0.054)	(0.054)	(0.055)	(0.055)	(0.056)	(0.042)	(0.063)	(0.082)	(0.163)
Input FTA lag 10+	-0.099	-0.101	-0.110	-0.114	-0.112	-0.105	-0.051	-0.050	-0.254***	-0.458**
	(0.071)	(0.071)	(0.070)	(0.072)	(0.070)	(0.069)	(0.059)	(0.069)	(0.077)	(0.198)
Observations	98000	90650	83300	75950	68600	61250	53900	46550	39200	31850

Note: *, **, and *** denote $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively. Standard errors clustered by exporter-importer-year, are reported in parentheses. The year in each column denotes the starting year in the sample.

Table 8: FTA effect on trade with more robust standard errors

	(1) Total	(2) Total	(3) Total	(4) Both	(5) Both	(6) Both	(7) Both
FTA lag 0	0.071*	0.514***	0.191**	0.072	0.668***	0.337***	0.200*
	(0.042)	(0.101)	(0.084)	(0.058)	(0.130)	(0.110)	(0.103)
FTA lag 5	0.185***	0.937***	0.406***	0.201***	1.174***	0.632***	0.414***
	(0.055)	(0.131)	(0.116)	(0.072)	(0.133)	(0.117)	(0.119)
FTA lag 10 +	0.154**	1.077***	0.288**	0.110	1.394***	0.604***	0.327**
	(0.070)	(0.131)	(0.139)	(0.090)	(0.134)	(0.135)	(0.148)
Input FTA lag 0				-0.001	-0.264***	-0.262***	-0.022
				(0.047)	(0.054)	(0.049)	(0.041)
Input FTA lag 5				-0.061	-0.435***	-0.439***	-0.053
				(0.055)	(0.033)	(0.023)	(0.039)
Input FTA lag 10 +				0.037	-0.556***	-0.586***	-0.090
				(0.067)	(0.046)	(0.037)	(0.059)
Observations	8784	9080	9080	17568	18160	18160	18160
pseudo-R^2	0.996	0.999	1.000	0.996	0.999	1.000	1.000
Domestic trade flows	No	Yes	Yes	No	Yes	Yes	Yes
Control for border		No	Yes		No	Yes	Yes
Control for border-input					No	No	Yes

Note: *, **, and *** denote p < 0.10, p < 0.05, and p < 0.01, respectively. Standard errors clustered by exporter-importer, are reported in parentheses.

Table 9: FTA's Effect with data in 5-year intervals (1970-2005)

	(1) 1974	(2) 1979	(3) 1984	(4) 1989	(5) 1994
FTA lag 0	0.200*	0.219**	0.238***	0.381***	0.261***
	(0.103)	(0.100)	(0.089)	(0.045)	(0.064)
FTA lag 5	0.414***	0.435***	0.456***	0.655***	0.493***
	(0.119)	(0.117)	(0.109)	(0.060)	(0.094)
FTA lag 10 +	0.327**	0.352**	0.388***	0.543***	0.562***
	(0.148)	(0.146)	(0.138)	(0.100)	(0.112)
Input FTA lag 0	-0.022	-0.049	-0.067*	-0.116**	-0.136**
	(0.041)	(0.040)	(0.040)	(0.047)	(0.061)
Input FTA lag 5	-0.053	-0.080**	-0.097**	-0.101	-0.218***
	(0.039)	(0.039)	(0.042)	(0.067)	(0.081)
Input FTA lag 10 +	-0.090	-0.125**	-0.146**	-0.068	-0.254**
	(0.059)	(0.060)	(0.065)	(0.094)	(0.102)
Observations	18160	15890	13620	11350	9080

Note: *, **, and *** denote p < 0.10, p < 0.05, and p < 0.01, respectively. Standard errors clustered by exporter-importer, are reported in parentheses. The year in each column denotes the starting year in the sample.

Table 10: The evolution of the FTA's Effect with data in intervals

	(1) 1974	(2) 1979	(3) 1984	(4) 1989	(5) 1994
FTA lag 0	0.187*	0.211**	0.243***	0.387***	0.270***
	(0.102)	(0.100)	(0.090)	(0.046)	(0.064)
FTA lag 5	0.410***	0.435***	0.469***	0.666***	0.503***
	(0.119)	(0.117)	(0.110)	(0.060)	(0.094)
FTA lag 10 +	0.276*	0.308**	0.358***	0.557***	0.574***
	(0.141)	(0.140)	(0.134)	(0.101)	(0.112)
Input FTA lag 0	-0.012	-0.040	-0.070*	-0.120**	-0.149**
	(0.040)	(0.039)	(0.040)	(0.048)	(0.060)
Input FTA lag 5	-0.047	-0.075**	-0.104**	-0.110	-0.233***
	(0.037)	(0.037)	(0.041)	(0.068)	(0.081)
Input FTA lag 10 +	-0.053	-0.090*	-0.126**	-0.080	-0.271***
	(0.052)	(0.054)	(0.060)	(0.094)	(0.102)
EU lag 0	0.166***	0.167***	0.164***	0.208***	0.221***
	(0.051)	(0.050)	(0.051)	(0.049)	(0.046)
EU lag 5	0.152**	0.153**	0.153**	0.219***	0.238***
	(0.067)	(0.066)	(0.068)	(0.073)	(0.068)
EU lag 10 +	0.359***	0.356***	0.365***	0.272***	0.296***
	(0.076)	(0.073)	(0.070)	(0.072)	(0.067)
Input EU lag 0	-0.142***	-0.148***	-0.165***	-0.183***	-0.251***
	(0.044)	(0.042)	(0.042)	(0.041)	(0.039)
Input EU lag 5	-0.155***	-0.161***	-0.179***	-0.235***	-0.307***
	(0.045)	(0.045)	(0.046)	(0.050)	(0.045)
Input EU lag 10 +	-0.273***	-0.277***	-0.306***	-0.267***	-0.342***
	(0.047)	(0.048)	(0.049)	(0.051)	(0.047)
Observations	18160	15890	13620	11350	9080

Note: *, **, and *** denote $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively. Standard errors clustered by exporter-importer, are reported in parentheses. The year in each column denotes the starting year in the sample. The Input-FTA and EU lags capture the additional effect with respect to the FTA lags. The Input-EU lags captures an additional effect with respect to the EU lags.

Table 11: European Union effect on trade in finals and intermediates

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