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TRADE RE(IM)BALANCED:
THE ROLE OF REGIONAL TRADE AGREEMENTS

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Trade Re(Im)Balanced:
The Role of Regional Trade Agreements

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Abstract

This paper documents the novel fact that Regional Trade Agreements (RTA) decrease bilateral trade imbalances as measured by conventional measure of the net export share in gross trade. While on average an RTA decreases bilateral trade imbalance by 7%, greater trade integration through a deeper RTA is associated with a reduction of up to 50% among the sample of over 160 countries since 1960. This implies, that the recent surge in net trade balances has appeared on behalf of the trade between countries that are not involved in RTA integration.

The driving channel is the enhancement of cross-border activity and increase in the global value chain integration among RTA members. Overall, this paper implies that the levels of RTA integration should be accounted for in the assessment of aggregate trade balances as the share of GDP, as trade flows bounded by different level of RTA integration will have different reactions to the same shocks. Additionally, I show that RTAs made trade more balanced among its members, and that global increase in the global trade imbalances happened on the expense of the non-RTA trading partners.

Keywords: trade imbalances, regional trade agreements, production integration, economic integration, global value chains
JEL classification: F10, F13, F14, F15, F40, F41, F45

1 Introduction

The role of regional trade agreements[1] (RTAs) in enhancing international trade has been widely discussed, while the question of how they affect trade balances between countries has not yet been investigated. This study empirically shows that aside from enhancing of trade between countries that sign an RTA, RTAs also decrease the bilateral trade imbalances between RTA member countries as measured by the net exports to gross trade. This indicates that RTAs should be taken into consideration when looking at aggregate trade balances (measured as a share of GDP), as trade imbalances associated with the different types of RTAs will have different characteristics.

Productivity gain has long been debated and now studied as the main gain from globalization [2]. At the same time, the expansion of global production networks - or global value chains in the jargon of specialists - has made it possible for countries to specialize in certain steps of production, rather than complete good. For some industries and countries the estimates of foreign value added - the share of value in the final good produced outside a country - reaches 40%. RTAs is a relatively new emergence in international trade, but their role in the recent trade increase since 1990s has been widely acknowledged[3] - as illustrated in Figure 1. Recent research indicates that countries are indeed more engaged in production network activities within RTAs[4], which implies that they engage in terms-of trade neutralization within the RTA (Staiger & Bagwell, 1999), and thus act more synchronized.

While trade has been increasing rapidly, so more trade imbalances - as illustrated in the graph 2 that shows the net exports by the type of RTA agreement. Figures 3 and 4 indicate that most of the increase in trade imbalances occurred in non-RTA trade, or on the expense of countries that started the RTA integration relatively late or low. The question is then, what is the role of different RTAs[5] in raising trade imbalances? This paper sheds light on

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[1]Under the jargon of WTO, all non-WTO agreements - all non-multilateral agreements - are considered "regional", even if they include countries that are not close geographically. In WTO jargon any agreement outside the GATT/WTO is called regional, even when the signing members are not geographically in the same region. In the Baier *et al.* (2014) all agreements are referred to as Economic Integration Agreements, but due to the conflict with WTO terminology I refer to them as RTAs.

[2]For an example of a country study Goldberg *et al.* (2010) is a good example. More recently a Ahn *et al.* (2016) performed a panel study.

[3]See, for example, Baier *et al.* (2015, 2014)

[4]The main reference for this used in this paper is Blanchard *et al.* (2016), who estimate that the applied tariff within RTAs is much lower for the imports that contain foreign value added used in domestic production. At the firm-level, Blyde *et al.* (2014) shows that M&A activity increases when countries enter an RTA.

[5]I borrow the classification of RTAs from the Baier *et al.* (2014): from less integrative non-reciprocal or

this connection, documenting new evidence and discussing possible implications.

Trade imbalances per se have been a discussion topic as both part of the current account, and the result of the production capacity of countries. While the former has seen assessments with various recommendations among the economists arguing for the need of greater overall balance (Blanchard & Milesi-Ferretti, 2010), the latter has not seen much assessment apart from some anecdotal cases. The most prominent case is China: since China has joined the WTO, many countries have seen a mutual rise in their trade imbalances with China. Big trade surpluses of China have been shown to be less detrimental than initially expected when experts identified the mismatch between trade and value flows[6] - some of Chinese exports provided cheaper imported inputs into the final goods production in other countries, increasing these countries' overall productivity. This highlights the mismatch between assessment of aggregate data on trade balance and the lack of data and understanding of the new price competitiveness measures, that incorporate global value chain activities.

While since WWII, import tariffs between countries have been declining, it should be noted that the biggest part of this overall decline happened before the 1980s. However, the trade has mostly expanded post 1980s. By extending the Ricardian model of trade, highly cited work of Yi (2003) explains this phenomenon through the ability of countries to vertically specialize, which makes the gains from the reduction of trade barriers non-linear.

Global value chains (GVCs) have spread throughout the world as the result of lowering trade costs and thus proliferation of the vertical specialization between countries. The final goods produced are now seen as a combination of shares of value generated domestically and in other countries. Signing an RTA is a step further from the WTO concessions, and allows countries to benefit even more from international trade and global value chain activity. RTAs reduce variable and fixed costs of international trade in such way that it allows for more value added to be generated within RTA to be traded on the more beneficial terms than the value added generated outside (Blanchard *et al.* , 2016). RTAs also address further issues such as institutional inconsistencies and inefficiencies associated with the economic activity that improve overall economic performance (Baier *et al.* , 2014; Handley & Limao, 2015).

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two-way Preferential Trade Agreements (PTAs), to Free Trade Agreements (FTA), Customs Unions (CU), Common Markets (CM) and Economic Unions (EUN) - with EUN being the deepest form of RTA. Description by type is available in Table2

[6]See, for example the analysis of Baldwin (2012)

"Regionalization" (through RTAs) can be seen from two angles - as an improvement to the overall productivity and overall trade performance, and as process that "locks out" other countries that are not participating in regional integration or were slow in starting it. The latter relates to the fact that within an RTA - as a result of initial RTA terms negotiations - countries neutralize their terms of trade, while making it harder for other countries to enter, as modeled by Staiger & Bagwell (1999). Their research develops a general equilibrium trade model that motivates the cooperation between the governments in implementing efficient trade agreements. From their point of view preferential trade agreements undermine the efficient multilateral development of international trade as through deeper cooperation the further neutralization of the terms of trades between its members is achieved. Subsequently, this neutralization leads to lower market prices for goods produced within RTA, while revealing further the comparative advantage of each member. Some of the goods then will be used as cheaper sources of inputs for production in other members - resulting in greater trade both within the RTA and between the RTA and other countries.

There are several measures of trade imbalances common to the literature. The most common one is the share of net exports over total trade flows - the absolute value of the resulting proportion is the main measure of the bilateral trade imbalance studied in this paper. Appropriate maximum likelihood techniques of beta regressions are used for estimating the proportions. Alternatively, I use the log of exports over imports measure of trade imbalances.

Altogether, RTAs result in greater trade integration between the countries that sign it. By taking the bilateral findings to the aggregate measures – looking at trade balance split by type of RTA scaled by the GDP – this paper then asks, what are the macroeconomic implications of this on the trade imbalances that countries have?

Regional trade agreements decrease bilateral trade imbalances between the countries that sign them, and the deeper is the agreement the lower is the resulting imbalance. This result of the paper is robust to various measures of trade imbalances, and shows that trade integration within RTA alters the trade flows between the participating countries not only quantitatively but also qualitatively. Thus, the ability of RTAs to enhance cross-border activity and favor GVCs among its members, makes trade within the RTA more balanced. The conventional trade theory suggests that at least in the case of a formation of a Customs Union this reduction in internal imbalances can only happen on the expense of the trade to outside of

the agreement. Similar observation can be made on the basis of figures 3 - 4 that show that overall the recent increase in net trade imbalances is happening on expense of no RTA trade flows. Therefore, I build several additional measures to assess the effect of signing an RTA on other bilateral relationships of the countries.

This paper empirically estimates the effect of RTAs on bilateral trade imbalances for the universe of countries that have enacted an RTA since 1960, and shows that entering an RTA on average reduces the bilateral trade imbalance between two countries by 7 per cent.

Utilizing information on the various types of RTAs, I show that deeper agreements cause a reduction of up to 50 per cent - with an exception of Economic Unions (EUN) that increase the bilateral imbalances by 12 per cent. This is assumed to be a result of two conditions: economic unions appear between the countries that, a priori to entering an agreement, are highly integrated - therefore their GVC networks are already highly consolidated - and the short time span of the data on economic unions[7] For instance di Mauro *et al.* (2016) discuss that Eurozone imbalances should be treated as a whole, and not by a separate country, while Blanchard *et al.* (2016) treat the Eurozone as a single country in the GVC framework. Therefore, the positive effect of entering a EUN on trade imbalances is seen as proof of the GVC-enhancing channel that lead to lower trade imbalances in the context of less integrated countries.

I find no evidence on the existence of direct trade diversion as postulated by the conventional trade literature (Viner, 2014), but I find that trade imbalance reducing effect of RTAs is driven at large by countries that are have relatively lower level of regional integration (as measured by the share of their trade done within RTA arrangements) before they enter an RTA. The higher is the initial level of regional trade integration for the country pair, the lower will be the trade imbalance reducing effect of signing an RTA. Thus if the trading partners have high initial level of regional integration, they will observe on average an increase from entering into a new RTA relationship. The average trade imbalances overall are though in general lower for the countries that exhibit high level of regional integration in their trade. Therefore, this primary results on trade diversion (or the absence of it) indicate that there are greater gains (in terms of trade rebalancing) for earlier and deeper trade integration, while the countries that start regionalising later on face additional macroeconomic consequences -

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[7]All economic unions appeared starting 2000, with the high prevalence in the data of Euroarea.

increase in their trade imbalance.

There is no single content to a type of RTAs, and every agreement is different, but nevertheless it should be noted that there is a tendency of progressive integration in RTAs that "deepening" of RTAs - trade agreements have a tendency to be signed from less integrative to more. This deepening implies that when making assessment of a given bilateral trade imbalance, we will be accumulating effects of the past levels of integration.

The result of this paper is highly relevant not only for the literature on GVCs, but also for macroeconomic analysis and policy making. While looking at bilateral trade imbalances is necessary to understand the effects of RTAs, it is less policy-relevant than the macro measure of aggregate trade balance. In turn, the aggregate trade imbalance measure is challenged in recent years as being non-descriptive and sometimes misleading in the current age of production chains and trade integration. This paper shows that trade balances between different trading partners belonging to different types of RTAs will be different quantitatively and qualitatively. Thus the assessment of the trade balance of a country should be performed by the type of RTA binding the trading partners, rather than the aggregate overall flows. Taking the analysis of the trade imbalances grouped by the type of RTA to the aggregate data, and find that greater trade integration (in the form of entering a deeper RTA) is associated with the reduction of the aggregate imbalance to the relevant group of countries. This implies that the rise of the global imbalances indeed can be at least partially contributed to the greater regionalization of trade.

Section 2 surveys the main contributions to the literature on RTAs and trade imbalances, while 3 lays out main findings observed about the nexus of RTAs effect on bilateral trade imbalances. Section 4 describes the data and main measures of bilateral imbalances; section 5 describes the empirical strategy used for the assessment. Section 6 provides the results while 7 concludes.

2   Background

This section gives a short overview of the importance of global trade imbalances and then argues that existence of an RTAs (while expanding trade between the countries) also is associated with the lower and more robust trade imbalance.

2.1 Trade Imbalances

A country running a trade deficit has to have the means to finance it, else it may pose potentially drastic implications for exchange rate adjustment and leads to economic crises (Obstfeld & Rogoff, 2009; Blanchard & Milesi-Ferretti, 2010). Since Chinese accession to the WTO the trade imbalances with China have been a widely discussed topic among professionals and experts. Recent research has established that the deficit/surplus itself does not pose a threat as long as it is sustainable, and that global financial integration may be held at the cause and at the same time cushion the deficits that are ran by some countries (Forbes, 2008; Bernanke, 2005; Dooley *et al.* , 2005). Leaving aside the precision of predictions of exchange rate adjustment and imbalances, most economists agree that current account and therefore trade imbalances illustrate the fundamental economic processes and are important channel for macroeconomic shocks transmission and need to be properly managed (Eichengreen, 2004).

The literature acknowledges the existence of "good" and "bad" imbalances in current account Blanchard & Milesi-Ferretti (2010), as resulting from cross-country differences in spending and savings behaviors. But trade imbalances, while widely discussed in the macroeconomic context, have rarely been investigated in the context of the new international trade patterns. International trade has implemented an enormous transformation in the last couple of decades, stepping away from final goods trade to the creation of global value chains and trade in services.[8] The conventional view trade balance depend negatively on domestic income and positively on foreign income (Goldstein & Khan, 1985) became more perplex with the expansion of the global trade links through complexity of production networks. With countries being more integrated and economic links becoming more prominent, domestic income of one country became more dependent on the income of other countries.

The recent Financial Crisis has resulted in a sudden reduction to the world capital imbalances; it has also spilled over the relatively more robust (as compared to the capital flows) trade flows - resulting in what was later called the great Trade Collapse. During the crisis the average reduction of aggregate trade was -22%, while individual countries saw reductions between 1% to 50%. At the same time the median change in bilateral trade was -20%, while some country pairs have observed heterogeneous response - from complete elimination

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[8]This is discussed in much of the literature, for example OECD & Group (2012); Bems & Johnson (2012)

to growth by 90% [9] of trade flows between them. Such heterogeneous reactions of trade imbalances motivates the research question of this paper; why some trade imbalances are more stable than others. Previewing the results, I will argue that RTAs are associated with relatively lower imbalances which at the same time appear to be more stable due to greater integration between the trading economies.

To exploit the link between trade imbalances and RTAs it is necessary to accept two thought exercises. Firstly, I depart from the conventional look at aggregate trade balances and rather look at the underlying bilateral trade balances between country pairs. This comes at a certain trade off of making the inference at the general global level[10]. Secondly, I take for granted that due to the proliferation of global value chains contemporary production of a good consists of the combination of the domestic and foreign value added - a striking difference from trade before the 1990s. Thus, modern day trade competition relates to rather production of more value added, than production of a final good (Blanchard *et al.* , 2016).

This paper is the first to link these two thoughts - bilateral trade imbalances and competition in value-added generated - to the type of RTA relationship between the countries and provides evidence that the existence of an RTA lowers bilateral trade imbalances. As an RTA usually concerns more than just a pair of countries, using type of RTA relationship as a proxy for looking at the aggregate trade balance than seems a plausible assumption. The building blocks of the related measures are discussed in the robustness section and are subject to further research.

In the next parts of this chapter I review the literature on the effect of RTAs on trade flows and document novel empirical facts about the bilateral trade imbalances.

2.2 Regional Trade Agreements

Regional Trade Agreements (RTAs) have seen a rise since the last decades of the previous century and they have been thoroughly studied. There is a vast growing literature on the emergence and effect of RTAs.

Leaving aside the selection into the RTAs[11], most of the researchers have been in consensus

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[9]Eliminating 10% of the extreme observations.

[10]These papers are usually referred to as case studies. For the example of such papers see di Mauro & Pappadà (2014)

[11]E.g. it could be a "natural" process (Frankel & Wei., 1995; Frankel, 1997) or because of other (more politicised) considerations (Vicard, 2011; Krishna, 2003).

that RTAs increase trade between the signing countries, with heterogeneous effect on different margins of trade Baier *et al.* (2014). The most recent work of Baier *et al.* (2014) using novel gravity estimation techniques indicates varying impact of different types of RTAs, depending on how integrative the RTA is. The classification of RTAs but integration level is summarized in Table 2. While there is some discussion about the appropriate techniques to assess the effect of RTAs, studies show that the average positive effect on the trade flows is a robust finding.

The results of this paper rely directly on the ability of RTAs to enhance global production integration within its members through development of GVC activities. This, in turn, relies on two key facts formulated in the literature before, which I will explain below: the political economy of protecting domestic value added rather domestic production in the process of tariff liberalization and the ability of RTAs to adress issues that go beyond the fixed and variable costs of trade.

The protection of domestic value added rather than domestic production during tariff liberalization relies on recent study of Blanchard *et al.* (2016). The study formulates the following idea: in the era of fragmented production and back-and-forth trade links, to gain higher benefits from trade liberalization, the applied tariffs are lower for the goods that are either inputs for the domestic high-value added production, or already have high level of domestic value added. The authors take their predictions to data on RTAs[12] and find that within RTA-trade as compared to non-RTA trade, apart from neutralization of terms of trade among its members, there are lower applied tariffs for imports from RTA partners that contain higher share of foreign value added that is used in the domestic production. This implies, that within RTA countries have more preferential tariffs for the domestically produced value added more, and it is used more in their production. This increases the bilateral trade flows between RTA countries and to other countries. To be illustrative, this means [on the example of NAFTA] that United States will have lower applied tariff for the imports from Canada and Mexico, which it uses more in its own production. Likewise will be applicable for Canada and Mexico. Such relationship allows countries within the RTA to uncover their comparative advantage more, have a more linked production networks, which

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[12]They perform two investigations: on the bilateral tariff preferences and on the temporary tariff barriers. The first one relates to the RTA tariff concessions, the second to antidumping and countervailing duties.

improves the overall productivity within the RTA. This [along with second finding discussed below] is the main channel for this paper, as it leads to a more GVC participation and, as a consequence, more *balanced* trade between the countries that have an RTA.

Another prominent result of RTAs discussed in the literature is that their effect goes beyond the reduction of the fixed or variable costs of trade - some RTAs address non-tariff barriers and institutional inconsistencies that distort trade. Therefore, even if the main concern of the RTAs is trade, they can impact other areas of economic activity (Bergstrand *et al.* , 2015; Handley & Limao, 2015), while the "deepest"[13] agreements have higher effects. Therefore, RTA effects can go beyond having a direct price measure of the effect Bergstrand *et al.* (2015).

Taking this two facts on RTAs already established in the literature - the preferential treatment of value added generated in other RTA members and ability to access issues beyond variable and fixed costs of trade - I investigate the relation between the RTAs and trade imbalances of the countries that sign them. Namely, if RTAs are found to increase both imports and exports while engaging more in each other's production - how do these effects balance out? Do the RTA-associated bilateral imbalances draw new characteristics? What are the implications for the different types of RTAs as classified by Baier *et al.* (2014)?

The next section of this chapter discusses why we should distinguish between RTA and no-RTA bilateral trade imbalances while providing novel stylized facts from the data.

3 Bilateral trade imbalances in RTAs

Before describing the already existing results and stating the novel empirical facts, it would be useful to provide some definitions. While the aggregate trade imbalance of a country is a very common measure, there are specific features of bilateral trade relationships that require a detailed definition of bilateral trade imbalance.

The formula for different alternative measures of bilateral trade imbalances are provided further in section 5, while for this section I use main conventional measure of share of bilateral net exports in total trade between two countries. As the bilateral imbalances are symmetric, taking absolute values makes all negative revert all imbalances to the positive side of the

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[13]I use terms "deepest" and "most integrative" agreements interchangeably

symmetric distribution. Every pair enters twice into the estimations - once from the side of the exporter, once from the importer.

Figure 1 shows the share of different types of RTA relationships into the growth of the world trade since 1970. Most of the growth past 1995 has been attributed to one or another form of an RTA relationship.

Figures 3 and 4 show the associated development in the imbalances by the type of the RTA relationship.

As was discussed before, most of the RTAs are a relatively new occurrence, and the most integrative forms of the RTAs only appeared within the last 20 years. [14] In order to make the analysis richer and escape the sample bias in the historical descriptions, for all descriptions I fix the samples to the type of the RTA relationship in 2010. Figure 4 shows that the highest increase in the imbalances (from about 0.3 to 2.4 bln USD) since 1990 is associated with the trading relationships between countries that have no any RTA in place.[15] The FTA agreements associated trade imbalance has seen the second biggest increase - from 0.13 to 1.01 bln USD - with all other types of RTA relationship having lower volumes both in the beginning and in the end of the observed period.

These absolute measures are not representative about the pair-wise trade developments, as along with the increase of trade in volume, there was an increase in the number of countries that trade between themselves. To account for this development, I use a relative measure of bilateral imbalances - distribution of the ratio of net bilateral trade to the gross bilateral trade. The results are presented in Figure 5. Greatest share of all trade imbalances (over 2/3 of all bilateral imbalances) are between the trading partners that do not have an RTA in place.

Next I turn to the RTA-type specific dynamics of bilateral imbalaces. Figure 10 stacks up all RTAs by their type enacted since 1960s, figure 11 provides the normalized results. They indicate that most RTA relationships were associated with lower bilateral imbalances. The notable exception are economic unions (EUN) - the deepest form of trade integration; countries that sign EUN are usually already highly integrated with very low initial imbalances,

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[14]First Economic Union dates to 1999.

[15]Figure 3 presents the development of the imbalances as per relationship between the trading partners in 1990 and it shows that it can indeed be assumed that the sample by the 2010 relationship is representative of the historical developments

and I discuss their association separately. Figure 12 provides the visual breakdown of 10 by the type of the agreement enacted, and it becomes more obvious that for the enactment of any RTA the starting embalances are indeed lower. In many cases FTA is enacted on the basis of PTA in place, therefore the pre-FTA imbalances will be post-PTA imbalances, and so on. All in all, the data suggests that bilateral trade imbalances are already lower when an RTA is signed.

These observations imply that there are some features of RTA relationships that are associated with the lower trade imbalances. The purpose of this paper is to empirically investigate these features to provide a plausible explanation of the channel leading to these features. Hence, the main finding of this paper is the following observation:

There are lower bilateral trade imbalances between the countries that have an RTA. "Deeper" trade agreements are associated with even lower bilateral trade imbalances.

As this paper estimates, an average effect of RTA on bilateral trade imbalances is a reduction of 7 per cent. As I also explore the effects of RTAs by type, the highest reductions are associated with entering a Customs Union or Common Market (the deeper forms of RTAs), the lowest - with non-reciprocal preferential trade agreements (the least deep type of RTA). Entering an Economic Union is associated with an increase in bilateral imbalances by 13 per cent - the finding discussed in detail below - such increase is associated with high initial integration between the countries that enter into an Economic Union.

3.1 Channel of the effect

While the data suggests this, which channel is forming this result? As discussed before, I base my hypothesis on the existent literature on RTAs effects: RTAs enhance GVC activity among RTA members through more preferential treatment of value added generated within an RTA and capacity to address other issues related to economic activities than fixed and variable costs of trade.

When an RTA is enacted, it affects the terms of trade of the participating countries by neutralizing them[16]. Starting with the least integrative to the deepest RTAs the clauses of

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[16]This in general refers to the fact that in presence of import tariffs there is a shift of costs on the foreign producers through the lower world price they are facing. See Staiger & Bagwell (1999) for the discussion on

RTAs can include simply the reduction (or elimination) of tariffs to the harmonization or standardization of other standards and even common tax systems.

As multiple studies have indicated, RTAs increase members' exports to other members and non-members.[17] RTAs provoke cross-border integration in production both in M& A activity between the members(Blanchard *et al.* , 2016) and provides better (more benefitial) treatment of value added generated in other members.(Blyde *et al.* , 2014) This integration uncovers further the comparative advantage while increasing the specialization - thus, also increasing vertical specialization. Looking into this GVC integration aspect of RTAs, two main features should be highlighted:

1. Formations of RTAs are based on value-added considerations of comparative advantage:[18]

   - Within RTA there is a more intensive two-way value added trade.

   - RTAs enhance GVC links within the RTA and specialization in tasks rather than goods

2. While addressing non-tariff issues, RTAs increase overall trade in the RTA.

It is right to assume, that by being able to specialise on the more value-added generating parts of the production process, rather than a complete good production and importing the remaining inputs from its RTA-trading partners at a cheaper price [than before RTA enactment], the overall country output increases, while the aggregate productivity within RTA improves too. This mirrors the fact that RTAs increase overall welfare gains of countries signing them, while possibly "locking out" gains from trade liberalization for some countriesStaiger & Bagwell (1999).

This stylized fact investigates the bilateral trade imbalances, but provides an important implication for the macroeconomic assessment and design. Trade imbalances between the countries that have a "deep" RTA in place are different from their counterparts between non-RTA trading partners - this implies that the the type of RTA arrangement should be

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the literature and political economy role in RTAs.

[17]For the most recent references please look at Bergstrand *et al.* (2015); Baier *et al.* (2014)

[18]The main reference for this is Blanchard *et al.* (2016), who refer to it as the political economy considerations of trade liberalization. Within RTAs there are lower applied tariffs on imports that contain foreign value added used in the domestic production.

accounted for in the aggregate measures of the trade imbalance. To illustrate the relevance of the imbalance-reducing effects of RTAs on the aggregate data, I perform a robustness check on the aggregated imbalances by the type of RTA relation, leaving further discussion to the future research.

The next section 4 describes the data used in the paper and the construction of the main measure of interest. The estimation strategy to test the listed above predictions is described in section 5 with section 6 providing the results.

4   Data

4.1   Data

The bilateral trade flows are from the IMF Direction of Trade Statistics, available from 1960 to 2013. The list of countries is presented in Table 17, split by the type of development as according to the IMF 2014. In the main estimations the 5-year data points are used, starting 1960. For the beta regressions pair-wise data on distance, language, contiguity and religion from the CEPII dataset is used. The choice of variables is akin to Baier *et al.* (2014), with the variables that will be captured in some types of RTA excluded (common currency, legal structure). All other country economic indicators are from the IMF IFS statistics. Regional trade agreements data is taken from the Bergstrand[19] dataset and classification is available in Table 2. For the full list of countries with RTAs by type and the timespan is akin to Baier *et al.* (2015) and is presented in the Appendix.

4.2   Measures of bilateral trade imbalance

The bilateral trade balance of country i to the partner country j is measured as the difference between the bilateral exports of country i to j and imports of i from j, normalized by the total amount of trade between the country pair ij:

$$Imbalance1_{ijt} = \frac{EXP_{ijt} - IMP_{ijt}}{EXP_{ijt} + IMP_{ijt}}$$

As the research question of this paper deals with trade balance between the trading

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[19]Available at www.nd.edu/ jbergstr.

partners, normalizing by the trade between them allows for accounting for the size of the relationship. In the estimations I use only the positive imbalances $Imbalance1_{ijt} \in [0; 1]$. Taking absolute values from the negative imbalances doubles the sample and, as all information is bilateral, is redundant. The closer $Imbalance1_{ijt}$ is to 0, the closer in values are the imports and exports between the countries i and j. Such trade is more *balanced*.

As a robustness check I also estimate an alternative measure of bilateral trade imbalance which is modelled after the work of Rose & Yellen (1989):

$$lmbalance2_{ijt} = log\left(\frac{EXP_{ij}}{IMP_{ij}}\right)$$

The estimation of regression on $Imbalance2$ is a standard linear regression. As distribution of $Imbalance2$ is symmetric around 0, so I only include the observations on the interval $(0; +\infty)$.

Measures of trade diversion

To make the analysis of the effect of RTAs on bilateral imbalances more complete, an important question should be asked: if entering an RTA relationship decreases bilateral imbalances, what does it do to the imbalances of country pairs outside this relationship? In trade literature this effect is called *trade diversion* and dates back to the Viner (2014) theory of Customs Unions.

As up to date there is lack of theoretically-based measurements of the trade diversion effect, I employ several empirical specifications to address the issue. First, I use technique akin to Dai *et al.* (2014) and construct a dummy $Div1$ that captures when one countries that does not have an RTA, sign an RTA with any other country. This dummy than subdivides the non-RTA trading pairs into the pairs that participate in no RTA-integration and pairs that are engaged in RTA activity, but not between each other. $Div1\_RTA_{ij} = 1$ implies that the pair ij does not have *any* RTA relationship in place, while one of the countries is engaged in *some* RTA activity with *some* of its trading partners. The positive value of $Div1$ coefficient implies that when one of the country pair has an RTA with another trading partner, the trade imbalance betweeb the pair at consideration increases. If trade diversion exists in the pure Viner (2014) context, than a positive value of the coefficient is anticipated.

Due to the lack of appropriate techniques of accounting for the diversions of heterogeneous RTAs, I use the same dummy when looking at the effects of the different types of RTAs.

The measure $Div1$ takes a value of unity with the presence of *any* regional agreement at all, without weighting its importance for the country's trade. Therefore, as an extension, a weighted measure of trade diversion is constructed.

$$Div2_{ij} = \sum_{k \neq j, l \neq i} \frac{(EXP_{ik} + IMP_{ik}) \times RTA_{ik} + (EXP_{jl} + IMP_{jl}) \times RTA_{jl}}{\sum_k (EXP_{ik} + IMP_{ik}) + \sum_l (EXP_{jl} + IMP_{jl})}$$

For every other bilateral relationship of countries in the ij pair across the set of trading partners $k \in K$ for country i and $l \in L$ for country j, $Div2$ represents the share of trade done along RTA-links in the total trade value of countries i and j, excluding the trade between the country pair ij. More precisely, $Div2$ indicates the overall exposure to the RTA-trade in total trade of the country pair.[20]

Distribution of diversion measure $Div2$ (by the country pair) are presented in figure 13. The figure indicates that most of the trading pairs are exposed to a relatively low levels of regional trade participation, while most of their trade is done with the non-RTA countries.

Gravity variables

It should be noted that all standard gravity variables are used as controls. I follow Baier *et al.* (2015) in eliminating gravity variables that are part or can be a result of the type of RTA signed - such as common currency, generalised system of preferences or common legal structure. As in every specification I employ country-time fixed effects (for both partners), I omit the controls for GDP and population since they will be collinear with fixed effects. I keep the pair-specific controls such as distance, common border, common language and common religious structure. The data on these variables is from the CEPII gravity dataset.

5 Empirical strategy

For all other forms of RTAs, there remains the question of endogeneity - whether the countries that sign an RTA decrease their imbalances or whether the signing an RTA is a consequence

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[20]One explanation will be for this measure as "regional resistance" term since it shows the general openness to RTA-trade of the country that the particular trade link is a subject to.

of lower bilateral imbalances. In the absence of a theoretical model, I acknowledge that it is hard to prove the causality, but, apart from performing additional empirical tests in the empirical section, I can relate to the following pattern: as RTAs tend to follow a deepening pattern, it is impossible to differenciate the enactment trends from the effect of the existent RTAs in effect[21].

5.1 Bilateral trade imbalances

In order to estimate the effect of RTAs on bilateral trade imbalances, I use the following specification:

$$lmbalance_{ij,t} = \alpha + \beta_0 RTA_{ijt} + \beta_1 Imbalance_{ij,t-1} + common\ gravity\ controls + \eta_{it} + \psi_{jt} + \epsilon_{ijt}$$

(1)

Due to the symmetric and non-linear nature of bilateral trade imbalances, the application of the gravity estimations is inappropriate for the main measure of the bilateral trade imbalance, and I use beta regression to estimate the regression on the *Imbalance*. The use of beta regression is due to the measure *Imbalance*: 1) being a proportion continuously distributed on the interval $(0, 1)$ (since bilateral imbalances are symmetric, it is fit to look at the trade imbalance as measured by absolute share of net exports over total trade) which implies a non-linear effect of variables; 2) it can be described through the mean and dispersion parameters, as variance tends to decrease when the mean gets closer to the boundaries. The beta regressions are not widespread in economics, while other social sciences have used them extensively[22]. Apart from high estimation costs that would result in the necessary reduction in the sample with the further inclusion of the fixed effects, when dependent variable is a relative proportion, the pair fixed effects leave too little variation on the LHS variable, including other estimation inconsistencies - see discussion under the alternative measure in the robustness checks. Instead, I include common pairwise controls, standard for the gravity framework.

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[21]See Appendix for a more detailed discussion of RTA deepening.

[22]Stata beta regressions are done through the `betafit` command. For further reference on beta regression or on how to go from the two parameter fit of beta regressions to maximum likelihood methods, read Ferrari & Cribari-Neto (2004); Paulino (2001); Smithson & Verkuilen (2006)

While this paper investigates the bilateral trade imbalances, trade agreements are usually signed by more than two countries. Moreover, the same country pair may be bound simultaneously by more than one RTA. This "deepening"[23] in trade integration makes controlling for country-pair unobserved heterogeneity with the presence of country-specific trend fixed effects to be collinear to the left hand-side variable of bilateral trade imbalances. While adding pair fixed effects is possible when I break the sample according to the type of integration, in order to preserve the global discussion I choose to add the common gravity controls for the pair-specific relationship. In the macro application section in results along with the discussion, I provide the aggregate estimations for the type of RTA relationship of the country, to provide as further robustness check.

The descriptive statistics above provide evidence that both trade imbalances are lower within RTA pairs. For the purpose of beta regression it means that a negative sign of $\beta_0 < 0$ is expected.

One of the possible concerns with estimation of the beta regression is that it excludes the zeros and ones point estimates. The missing trade flows could be seen as zeros, while the absolute imbalance equal 1 is present in 1011 (less than 1%) cases. While this is not expected to bias the results in the meaningful way, as the scope of the question is whether the existence of RTAs balances the trade more as compared to the other trade flows, I perform a zero-inflated beta regression as a robustness check.

To measure whether different types of integration agreements have different effects, I use the classification of RTAs in the Bergstrand dataset.

$$lmbalance_{ij,t} = \alpha + \beta_1 NR\_PTA_{ijt} + \beta_2 PTA_{ijt} + \beta_3 FTA_{ijt} + \beta_4 CU_{ijt} + \beta_5 CM_{ijt} +$$

$$+ \beta_6 EUN_{ijt} + \beta_7 Imbalance_{ij,t-1} + common\ gravity\ controls + \eta_{it} + \psi_{jt} + \epsilon_{ijt} \quad (2)$$

As discussed above, I extend the analysis from the simple gravity-driven framework and attempt to implement the trade diversion analysis. $Div1$ is a dummy for when one of the ij countries that do not have an RTA agreement is engaged in RTA activity with other trading

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[23]This refers to the RTAs tendency to deepen, and for the countries that do not have any type of RTA in place, start their relation with the less integrative forms of RTAs. See Appendix for the full discussion and statistics on deepening.

partner. The specification on the heterogeneous types of RTAs takes the following form:

$$lmbalance1_{ij,t} = \alpha + \beta_1 NR\_PTA_{ijt} + \beta_2 PTA_{ijt} + \beta_3 FTA_{ijt} + \beta_4 CU_{ijt} + \beta_5 CM_{ijt} +$$

$$+\beta_6 EUN_{ijt} + \beta_{13} Imbalance_{ij,t-1} + \beta_7 Div1\_RTA_{ijt} + common\, gravity\, controls + \eta_{it} + \psi_{jt} + \epsilon_{ijt}$$

$$(3)$$

For example, $Div1\_RTA_{ijt} = 1$ when there is no RTA (of any kind) between the country pair ij, but one of the countries - either i or j is a part of some RTA agreement with some of its trading partners.

For the measure $Div2$ that measures the relative regional engagement of the country pair I make no distinctions between the types of RTAs in construction of the measures. Differentiating between the types of RTAs will require a weighting scheme among the types of RTA (as, for example, "an FTA relationship is twice more regionally engaging than a PTA relationship", or alike) that will be universal for all countries. The specification for $Div2$ takes the following form (for the regressions on the heterogeneous types of RTAs):

$$lmbalance_{ij,t} = \alpha + \beta_1 NR\_PTA_{ijt} + \beta_2 PTA_{ijt} + \beta_3 FTA_{ijt} + \beta_4 CU_{ijt} + \beta_5 CM_{ijt} + \quad (4)$$

$$+\beta_6 EUN_{ijt} + \beta_7 Imbalance_{ij,t-1} + \beta_8 Div2_{ijt} + common\, gravity\, controls + \eta_{it} + \psi_{jt} + \epsilon_{ijt}$$

or with an interaction term:

$$lmbalance_{ij,t} = \alpha + \beta_1 NR\_PTA_{ijt} + \beta_2 PTA_{ijt} + \beta_3 FTA_{ijt} + \beta_4 CU_{ijt} + \beta_5 CM_{ijt} + \quad (5)$$

$$+\beta_6 EUN_{ijt} + \beta_7 Imbalance_{ij,t-1} + \beta_8 Div2_{ijt} +$$

$$+\beta_9 NR\_PTA_{ijt} \times Div2_{ijt} + \beta_{10} PTA_{ijt} \times Div2_{ijt} + \beta_{11} FTA_{ijt} \times Div2_{ijt} +$$

$$+\beta_{12} CU_{ijt} \times Div2_{ijt} + \beta_{13} CM_{ijt} \times Div2_{ijt}$$

$$+ common\, gravity\, controls + \eta_{it} + \psi_{jt} + \epsilon_{ijt}$$

There is no clear prediction in trade theory on how the higher regionalisation of trading

partners (higher values of $Div2$) have on the trade between them. One – possible – assumption would be that if all types of RTA activity provoke trade diversion à la Viner (2014), than the coefficient β_8 in equations 4 and 5 will have a significant and positive coefficient.

The next section will introduce and discuss the results that of the estimations.

6   Results

6.1   Bilateral Trade Imbalances

In table 6 the results of the regression 1 are presented. The average effect of joining any type of RTA from 1960 to 2010 decreases the bilateral trade imbalances between countries by 7 per cent. When controlling for the the lagged effect of entering into an RTA, the effect is 8 per cent.

As discussed above and in much of the trade literature, different type of trade agreements have heterogeneous effect. This is consistent with the estimations by the type of an RTA in columns (3) and (4). Non-reciprocal trade agreements do not have a significant effect on the bilateral trade imbalances - the result consistent with the literature that finds PTA having little or no effect on trade flows(Baier *et al.* , 2014).

The coefficients do not appear to increase with the level of integration, but rather follow a hump shape: signing a reciprocal regional trade agreement decreases bilateral trade imbalances by 4 per cent, an FTA – by 15 per cent, Customs Union has the highest effect of decreasing imbalance by 50 per cent, Common Market – 28 per cent.

Some agreements appear to have greater lagged importance rather than contemporaneous: the reciprocal PTA, FTA and CM loose the significance of the contemporaneous effect, while the coefficient on the lag is negative and significant. As I am looking at the five-year averages, this can be explained by short-term (but persistent[24]) versus long-term effects of the RTA: it reduces the trade imbalance between the countries that sign an RTA, but different agreements at a different pace. The effect of Customs union decreases, but appears to be both significant for both the contemporaneous and lag variables with reduction by 33 and 22 per cent respectively.

In general, I find that, as suggested by the data, RTAs are associated with greater balance

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[24]as implied by volatility

between bilateral trade flows. For most of the deeper RTA the effect is most pronounced, but the deepest type of trade arrangement – economic union - is associated with a positive effect on bilateral trade imbalance. Next I uncover how this result supports the idea that RTAs change the characteristic of the bilateral trade flows.

Trade diversion results

In the previous section 5 I have introduced two measures that are aimed to investigate what is the effect of the RTAs on the other bilateral relationships of the countries that enter into an RTA relationship. This is commonly called the trade diversion effect. In concordance to that, the first measure constructed is the dummy for when one of the countries in a country pair ij with no RTA between them enters an RTA (of some type) with any other trading partner. Table 7 provides the results. In columns (1) and (2) the results for the overall RTA dummy are presented, while in columns (3)-(4) the results for regressions with the heterogeneous types of RTAs are presented.

The $Div1$ measure has no significant coefficient in any of the specification - overall and by the type of RTA. This implies that there is no trade diversion in a purely à la Viner (2014) sense.

The average result of entering into an RTA remains the same, as the reduction by 9% is observed (columns (1) and (2)). The results on heterogeneous RTAs indicate that when $Div1$ dummy is introduced, the PTAs – both non-reciprocal and reciprocal – lose their bilateral trade imbalance reducing effect, except for 21% effect of the lagged non-reciprocal PTA by and 6% decreasing effect of the lagged reciprocal PTA. this suggests that "shallow" RTAs need more time to effect the trade imbalance. Signing into an FTAs or CUs significantly decreases bilateral trade imbalances by 12-22%% - the result in line for the highest estimates of the benchmark regressions (with no diversion measures). Signing a CM agreement appears to have no effect on imbalances between the trading partners, while EUN has either an increasing effect - result alike to the previous estimations.

It should be put into consideration that an alternative dummy-driven assessment of the trade diversion effect of RTAs would include the cumulative effect of the existent RTA relationships. So that the diversion of entering a CU (customs union) will have the effect on the pairs where is a lower trade agreement in place (like a PTA or FTA). This is left for the

future research.

Results of estimations on the other measure of trade diversion $Div2$ are presented in the table 8. The results suggest that the more integrated is the country pair in the regional activity apart from the trade between each other, the lower will be the bilateral imbalance (negative coefficient of $Div2$). As the mean value of $Div2$ is 0.16 (the distribution of the measure is in figure 13), the average engagement into the regional trade is associated with 48-64%% lower overall bilateral imbalances.

The novel result is produced by the introduction of the interaction term between RTA dummies and measure $Div2$. While the trade imbalance reducing effect of entering most of the types of RTAs remains robust, the interaction term shows that this is mostly driven by the countries that are not already heavily engaged into regional trade. While the average effect of entering any RTA, signing a PTA, FTA, CU or CM varies between a decrease from 15% to 70% of bilateral trade imbalance, the interaction with $Div2$ for all this measures is highly significant and positive. A country that is averagely participates in regional trade (16% of its trade is trade within RTA) observes a lower decrease in bilateral trade imbalance - 8% less on average;[25] 10% lower reduction when entering an FTA, 21% lower reduction when entering a CU, 12% lower reduction when entering a CM.

EUNs appear to observe a greater increase of bilateral imbalances when countries are highly regionally integrated.

Economic Unions

Table 6 shows that the coefficient associated with economic union (EUN) appears to be inconsistent with my main hypothesis of imbalance-reducing features of RTAs. EUN has a positive and significant coefficient of 12%, while looking at the lag effect it increases up to 31 per cent. This controversial finding is a result of the following facts: firstly, as observed in figures 11 and 10 bilateral trade imbalances are on average much lower between countries that are entering into EUN. Secondly, the EUN type of agreements are a relatively new phenomenon between highly advanced economies, whose production chains are already highly integrated.

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[25]$0.5*RTA \times Div2$ with the average $Div2 = 0.16$ is 0.08, which implies a reduction of the negative effect of entering an RTA. The average effect of entering an RTA is $-0.25 + 0.08 = -0.17$ – the reduction of bilateral trade imbalance by 17%. This is comparable to the non-interacted coefficient.

When controlling for the lag level of the bilateral trade imbalance - column (3) of table 6, though the contemporaneous effect of entering an economic union decreases by 1%, in the specification with both the contemporaneous entry and the lag, the effect appears to be +29 and -22 percent respectively. This illustrates the fact that EUN type of relationship is more complex. Indeed, as recent research by Lopez-Garcia (2015) argues, the Eurozone (the biggest and most prominent EUN) looking at the bilateral trade flows within the EU is misleading, as countries are deeply integrated.

Being highly integrated initially, countries that enter into an economic union, integrate even more and increase their bilateral trade imbalances. As measured in gross trade data on value flows is now available for a sample of countries, the bilateral trade flows for EU conceal the real activity between the countries: even while bilateral trade flows within EU seem to be quite unbalanced, the value flows between them are highly balanced(Nagengast & Stehrer, forthcoming).

Altogether, this result supports the idea that RTAs, by addressing the issues further than tariffs, induce the structural transformation within the countries that enter such a relationship. The case of EUN has to be treated as the result of the deepest structural transformation - the absence (or the presence of the minimal possible level) of any institutional barriers changes the nature of the trade between the countries.

6.2 Robustness Checks

Following Rose & Yellen (1989) for the robustness checks I also look at the alternative measure of trade balance is

$$lmbalance2_{ijt} = log\left(\frac{EXP_{ij}}{IMP_{ij}}\right)$$

The measure $Imbalance2_{ijt}$ is unbounded, but symmetric around 0, therefore I limit $lmbalance2_{ijt} >= 0$, so that the decrease in the measure will indicate a value of bilateral exports closer to the value of bilateral imports and thus $\beta < 0$.

Then the regression looks akin to the most recent advances of the gravity framework:

$$lmbalance2_{ijt} = \alpha + \beta_1 NR\_PTA_{ijt} + \beta_2 PTA_{ijt} + \beta_3 FTA_{ijt} + \beta_4 CU_{ijt} + \beta_5 CM_{ijt} +$$

$$+ \beta_6 EUN_{ijt} + \lambda_{ij} + \eta_{it} + \psi_{jt} + \epsilon_{ijt} \quad (6)$$

Since this is not a beta-regression, there is no constrain by the character of the left-hand side (it's no longer a proportion, bounded between 0 and 1, but a ratio of exports to imports) or the calculation size. But the symmetry of the distribution makes the fixed effects fixed coefficient estimation not representative of the actual effect of the RTAs on bilateral imbalances (see table 11, regressions (1) and (3)), since it assumes a fixed effects of any RTA within any country-pair, assuming zero correlation between the country-pair fixed effects. On the other hand random effects allows for different effects of the same type of RTAs on a country pair and allows for correlation between the country-pair effects. For completeness I present both fixed and random effects estimations results, but random effects estimation is more preferred.

There can be two points formulated that supports the random effects application:

- Using fixed effects fixed coefficient is proven to be theoretically and empirically inferior to the fixed effects random coefficient estimation (Baier *et al.* , 2015)[26]

- The measure *Imbalance*2 is a ratio, there are two possible processes that can lead to the decrease of it: increase in the denominator and decrease in the numerator. Without allowing for the random coefficients the estimation on the bilateral level is economically meaningless.[27]

Using estimation specified above yields the results presented in table 11.The average effect of signing an RTA is a reduction of the trade imbalance by 9%, with all different types of RTAs having a trade imbalance reducing effect. The only difference from the results of the main specification is that the reciprocal PTAs is insignificant and a coefficient for the non-reciprocal PTAs becomes negative and significant. The reason could be that non-accounting for the partner economies sizes were driving the result on the PTA and making the coefficient

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[26]This is, briefly, due to: common multiple membership in different RTAs for countries which lead to little RHS variation; diverse effect of same type of EIA due to variance in geographic, institutional, other factors; high restrictive results within *ex post* estimation

[27]Full discussion in the Appendix.

of non-reciprocal PTA insignificant. Controlling for the size of the trading partner economies the reduction of the PTA-associated imbalances becomes not significant (it thus can be driven by the growth of the countries and them trading more), while the country pairs that had an non-reciprocal PTA (GSP) relationship, when controlled for the pair-wise characteristics, were having lower trade imbalances when the non-reciprocal PTA took place.

As it has been discussed before, trade integration usually follows a deepening pattern - going from less integrative to the deeper ones. One of the natural ways for control for the "deepening" in integration is to regress the subsamples of different RTAs and no-RTA observations. Table 13 provides the results. The results in columns (3) and (4) suggest, that only entering FTA or CU will result in a significant reduction in trade imbalances. The results (5) and (6) indicate that the deeper agreements seem to have no significant effect - relating to the discussion of table 5 this empirical result illustrates that Common Markets and Economic Union agreements indeed build up on the basis of the previous agreements - FTAs and CUs.

6.3   Implications on the volatility of imbalances

So far I have discussed the level effect of the RTAs. The imbalance reducing effect of RTAs is channeled through their ability to increase the GVC activity within the RTA, which increases production dependency between the participating countries. In this section I provide the results on the impact of RTAs on the volatility of bilateral trade imbalances. The main takeaway is that signing an RTA decreases the volatility of the bilateral trade imbalances. And, alike with the effect on the level of imbalances, "deeper" trade agreements have quantitatively bigger effect.

The less volatile trade flows result from the proliferation of the global value chain links: while I have been discussing how countries are becoming more dependent within the RTA on the trade flows from each other, it also implies that it is harder to substitute the imported inputs (foreign value added used in domestic production) for inputs produced domestically or in another country. Over time, this means that the trade flows will be less volatile.

I use the most widely used measure of the volatility - the standard deviation of the first difference of logarithms of the measure in question. This measure will be equal to zero if the imbalances follows a constant trend, which presumably could be anticipated and therefore

should no be the source of the uncertainty.

$$ImbVolat = \sqrt{\frac{\sum\limits_{t=1,5}\left(Imbalance_t - \overline{Imbalance}\right)^2}{4}}$$

I use the five-period data, and volatility is measured based on the five-year period. As the volatility measure is a second order measure of trade imbalances and is not non-linear in nature and controls for the trend behavior of the imbalance,[28] I can follow Baier *et al.* (2015) and use the standard gravity framework to asses the impact of RTAs on volatility:

$$ImbVolat_{ij,t} = \alpha_0 + \beta_1 RTA_{ijt} + \lambda_{it} + \psi_{jt} + \eta_{ij} + \epsilon_{ijt}$$

$$ImbVolat_{ij,t} = \alpha_0 + \beta_1 NR\_PTA_{ijt} + \beta_2 PTA_{ijt} + \beta_3 FTA_{ijt} + \beta_4 CU_{ijt} +$$
$$+ \beta_5 CM_{ijt} + \beta_6 EUN_{ijt} + \lambda_{it} + \psi_{jt} + \eta_{ij} + \epsilon_{ijt}$$

It can be expected that there will be a reduction in the volatility observed with greater trade integration. The specification controls for partner-specific time-variant, pair-specific time invariant fixed effects.

As discussed in the previously, participating in an RTA is associated with lower trade imbalances between the signing country-pair. The figures 10 and 11 indicate that not only the level of the imbalances goes down, but also the volatility decreases when an RTA is signed - implying that the RTA bound imbalances are more persistent. Indeed, the results of the volatility regression indicate in table 14 that after an RTA is enacted, volatility is lower on average by 5%. When adding lags, both coefficients are negative and significant and the joint effect is 6% reduction over 10 years. Notably all types of the RTA are associated with the reduction of the volatility - both contemporaneously within the 5-year period or with a 5 year lag. The zero volatility of trade imbalance implies that throughout the 5 year period

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[28]It disregards the direction of the imbalance: decrease in the measure will mean the imbalance is more stable, while increase will imply that it becomes more volatile. There is no restriction on the change of the enumerator or denominator.

the trade imbalance was constant or followed a constant pattern.

The results on the non-reciprocal preferential trade agreements (NR-PTA) provide an important insight into the motivation for signing such agreements that according to some research do not have a robust effect on bilateral trade flows (nor on the reduction of the bilateral trade imbalance): the one-way preferential trade agreements reduce the volatility of the bilateral trade imbalances. Two countries that enter into an one way PTA will get a more constant trend in the balance of trade between them.

I include separate and joint regressions on lags as trade agreements take some time to be actually implemented; the effect on the trade pattern may take longer and therefore it is more likely to have a long-term effect on the volatility. All types of trade agreements reduce the volatility of the bilateral trade balances - long-term or both long-term and contemporaneously. The biggest effect on the reduction of volatility is observed for the Customs Unions and Free Trade Agreements (12% and 10% respectively). In combination with the high coefficients for the reduction of trade imbalance, this implies that the Customs Unions and Free Trade Agreements provide the biggest 'trade stabilization' effect.

The EUN, being the "deepest" economic integration agreement, low coefficient is surprising. But this low coefficient can be explained through the short length of time series that we have on the Economic Unions and small sample while still providing deep integration. Also, as discussed before, trade flows within EUN can be interpreted different.

6.4 Macroeconomic Relevance

One of the concerns that arise is that the the measures of the bilateral imbalance that are used may overestimate the importance of some of the trading partners, as they are not weighted by the countries' GDPs. Adopting the conventional GDP-weighting scheme $\frac{EXP_{ij} - IMP_{ij}}{GDP_i + GDP_j}$ will bias the results due to the high importance of the size of the trading economies, without relating to the level of trade between them that is enhanced through the RTA. In order to see the effect of the RTA while normalizing the trade imbalances by the size of the economy I adopt the following measure:

$$Imbalance3_{it} = \frac{\sum_{j \in J} (EXP_{ij} - IMP_{ij})}{GDP_i}$$

*Imbalance*3 is akin to the traditional aggregate GDP-weighted trade balance, but it splits the trade imbalance by the type of RTA relationship between the trading partners. Subsamples J represent the types of RTA trading partners fixed to the 2010 type of relationship for the estimations. This is justified by two reasons: firstly, 2010 represent the greatest trade integration in the world economy; secondly, by fixing the subsamples we can see the effects of the i country entering into the given type of RTA relationship on the trade balance with the specified subsample. Figure 2 illustrates the average dynamics of the subsample-fixed trade imbalances weighted by the GDP. As compared to 1990 the biggest rise in the RTA-associated imbalances weighted by the GDP was to the non-RTA trading partners. All other types of imbalances saw a much lower rise.

The equation 7 below estimates the effect on GDP-weighted trade imbalances to pre-specified subsamples of trading partners of country i of country i entering into a specific RTA relationship with the group j.

$$lmbalance3_{j,it} = \alpha + \beta_1 NR\_PTA_{it} + \beta_2 PTA_{it} + \beta_3 FTA_{it} + \beta_4 CU_{it} + \beta_5 CM_{it} +$$
$$+ \beta_6 EUN_{it} + \eta_{it} + \epsilon_{it} \quad (7)$$

$\sum_j lmbalance3_{j,it}$ is equal to the conventional measure of the aggregate trade imbalance of country i at time t. The right hand side is a set of dummies for the type of trade integration,

Table 12 presents the results of the above estimation. Column (1) runs estimation on the full sample and shows that the previous results on average mostly hold. For example, entering a free trade agreement decreases the GDP-weighted imbalance with the trading partners in the given agreement by 0.7%; further signing of a Customs Union agreement decreases it by 0.6% more. There are two distinctions from the main results: the positive PTA coefficient and negative and significant EUN coefficient. The former is driven by the low-income countries - as seen from the decomposition of the results in the columns (2)-(4); while the latter supports the idea that bilateral trade imbalances within an economic union are uninformative. An Economic Union trade should be looked at in a complex rather than individual trade flows: when I regress the aggregate subsample-fixed measure of the trade imbalance weighted by host country GDP on the types of RTA, EUN decrease the trade

imbalance.

Altogether, the results on the aggregate measure *Imbalance*3 suggest that deeper trade integration indeed fosters lower trade imbalances: as the measure is fixed to a certain subset of the trading partners, it represents the development of the trade imbalance. Thus, the trade imbalances are lower, the deeper is the level of trade integration between countries.

One of the most important implications concerns the transmission of the exchange rate shocks and price competitiveness within an RTA agreement (di Mauro & Pappadà, 2014). The greater production dependence makes trade imbalances more robust, implying that a relative price decrease in one of the members will not affect the trade flows as much. In order to produce the now relatively cheaper exports, the member whose currency has depreciated will buy more relatively more expensive imports from its RTA trading partners. This mechanism is described both theoretically and estimated empirically in the paper "Exchange Rates, International Trade and Growth: Re-Evaluation of Undervaluation".

Further research should study the features of RTAs that induce the reduction of the imbalances. For example questions could be asked about whether the institutional quality in RTA partners or the legal enforceability of certain clauses in trade agreements increase the success of RTA in reducing trade balances.

7   Conclusions

This paper is the first to document the novel fact that regional trade agreements (RTAs) reduce bilateral trade imbalances between the countries that sign the agreements. Deeper forms of trade agreements are associated with even lower bilateral trade imbalances between the participating countries. Deeper trade integration through RTAs allows the countries to utilize their comparative advantage in tasks, rather goods production, while importing other inputs from other RTA members at a more beneficial price. Altogether, this paper combines two policy relevant issues into a joint framework.

First, RTAs have been a wide-used and well studied mechanism of enhancing trade. Two important features of RTAs are discussed in this paper: concern with value added generation rather than goods production in the process of tariff liberalization in RTA, and the ability of RTAs to address issues beyond the cost factors of trade are addressed. Former relates

to the recent study of Blanchard *et al.* (2016), while the example of the latter can be seen in any most of the recent trade agreements. These agreements - new standard being the TPP - contain the provisions on property rights and regulations, investor disputes and settlements - thus they make the environment of trade between more economically and legally robust. Thus, RTAs enhance cross-border production activities and reveals the comparative advantage of participating countries further.

Second, while the importance of trade imbalances for the macroeconomic transmission of shocks and general formation of macroeconomic policies has been undoubtful, the current focus on the expansion of production links between countries has shed light on the usefulness of disaggregate trade imbalances.

Following the various estimation techniques, this paper documents that depending on the type of RTA signed, bilateral trade imbalances decrease by 4% to 50%. The size of the decrease depends on the type of the RTA signed - with generally more integrative RTAs resulting in greater reductions. One - seemingly - exception are Economic Unions, as entering an Economic Union is associated with trade imbalance increase.

The additional analysis indicates that the reduction of the bilateral trade imbalances when entering an RTA happens mostly on the expense of the country pairs that are not initially highly integrated in regional trade. While the average regionalisation of trade (measured as the share of regional trade in total trade flows) is on average just 16%, it implies that the trade balance reducing effect is lower for countries that start regionalizing later.

Performing volatility analysis, I also find that bilateral trade imbalances become less volatile when an RTA is enacted, with the coefficient varying from 2% to 10%. I interpret this as supporting evidence for GVC enhancing activity within RTA: it is harder to substitute imported inputs with domestically (or from another source) when a country becomes narrowly specialized on a certain step of production, while importing the rest.

The result of this paper has an important application: trade integration through global value chains has altered the bilateral trade (im)balances quantitatively and qualitatively, making the aggregate measure of trade balance of a country if not misleading, then deeply shortsighted. Regional Trade Agreements have been in part responsible for such development as countries neutralize the terms of trade within the agreement, their economies become more integrated, and bilateral trade imbalances between countries that sign a trade agreement

are lower, the more integrative the agreement is. The macro application implies that the aggregate trade balance should account for the type of RTA integration since the reaction of the trade flows associated with the specific RTA will be different. One of such applications is investigated in the companion paper: the adjustment of the aggregate trade imbalance trough the improvement of the terms of trade will be asymmetric between trading partners that have an RTA and those who don't, and less efficient on aggregate.[29] Therefore, looking at the degree of economic integration of a country with its trading partners through RTAs can serve as a proxy for heterogeneous transmission of the exchange rate shock and the effectiveness of the exchange rate policy.

By looking at the effect of heterogeneous trade agreements on bilateral trade balances, this paper highlights an important link between the integration of countries through trade and economic agreements. Looking at the trade balance of a country depending on the type of integration with its trading partners will be a more relevant statistic, that can account for macroeconomic issues.

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[29]The model of the asymmetric improvement of the trade balance due to the change in the terms of trade between countries is presented in the companion paper "Exchange Rates, International Trade and Economic Growth: Re-Evaluation of the Undervaluation"

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Table 1: Evolution of the type of RTA in bilateral relationships

Year	NR_PTA	PTA	FTA	CU	CM	EUN
1965	113	84	84	12	0	0
1970	129	152	104	12	0	0
1975	1791	371	152	102	0	0
1980	1977	442	153	112	0	0
1985	2253	746	199	173	0	0
1990	2460	764	245	207	0	0
1995	2784	874	444	189	208	0
2000	3132	878	1053	204	138	216
2005	4089	641	1510	252	574	216
2010	3407	2426	1874	285	536	326

Table 2: descriptions of types of RTA

Indication	Type of Agreement	Definition
NA	No Agreement	No preferential trade agreement
NR_PTA	Non Reciprocal Preferential Trade Agreement	Preferential terms and customs concessions given by developed nations to developing countries
PTA	Preferential Trade Agreement	Preferential terms to members vs. non-members
FTA	Free Trade Agreement	Trade barriers eliminated (or substantially so) among members; treat non-members differently
CU	Customs Union	Same as FTA; but treat non-members the same
CM	Common Market	Same as CU; but also includes free movemet of labor/capital
EUN	Economic Union	Same as CM, but also monetary and Fiscal Policy coordination; further harmonization of taxes/regulation/monetary systems

Figure 1: World trade by the type of RTA
(bln current USD)

| No RTA | One way | Two way | FTA |
| CU | CM | EUN | |
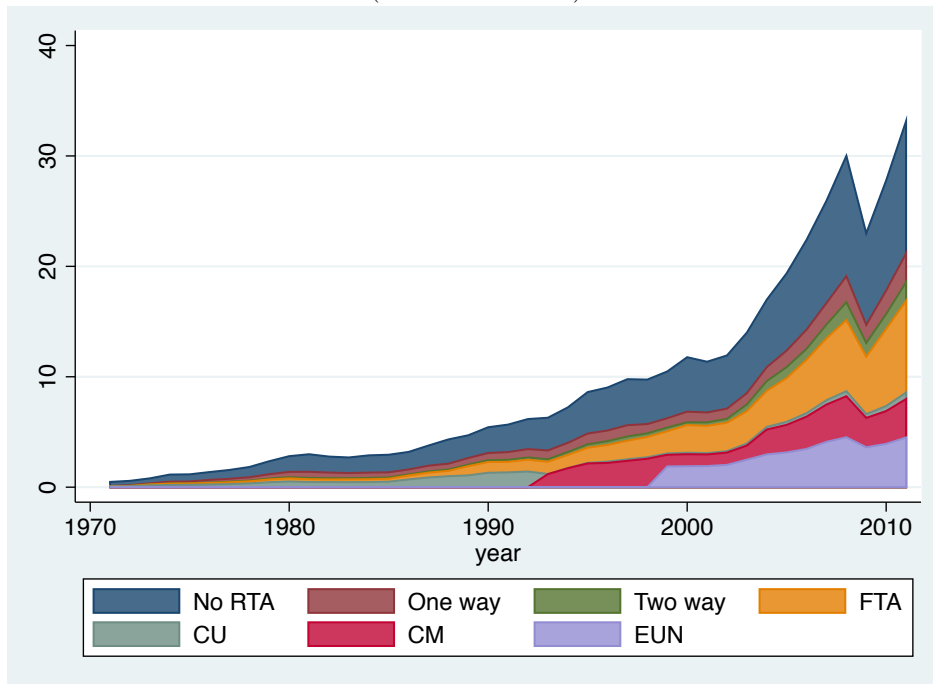
Figure 2: World net imbalances by the type of RTA
(bln current USD)

| No RTA | One way | Two way | FTA |
| CU | CM | EUN | |
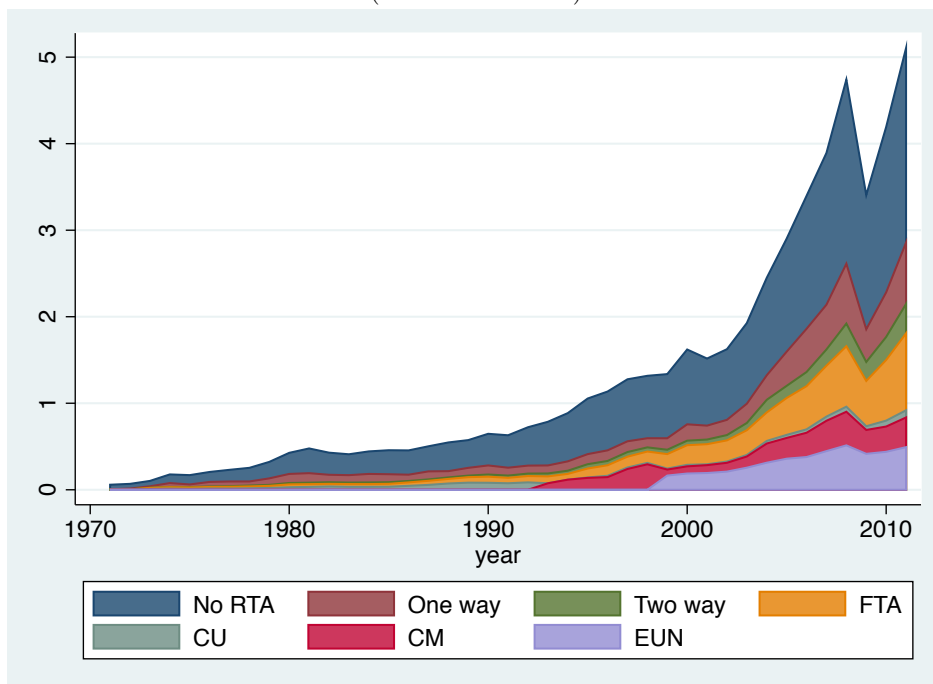
Figure 3: Imbalances by the type of RTA
(country groups defined to 1990, bln current USD)
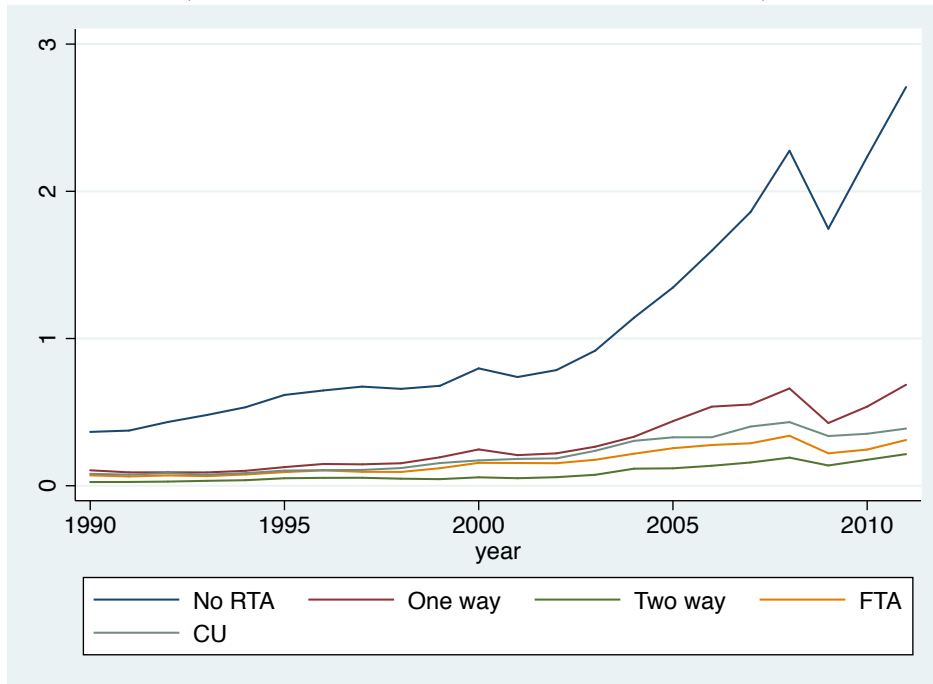
Figure 4: Imbalances by the type of RTA
(country groups defined to 2010, bln current USD)
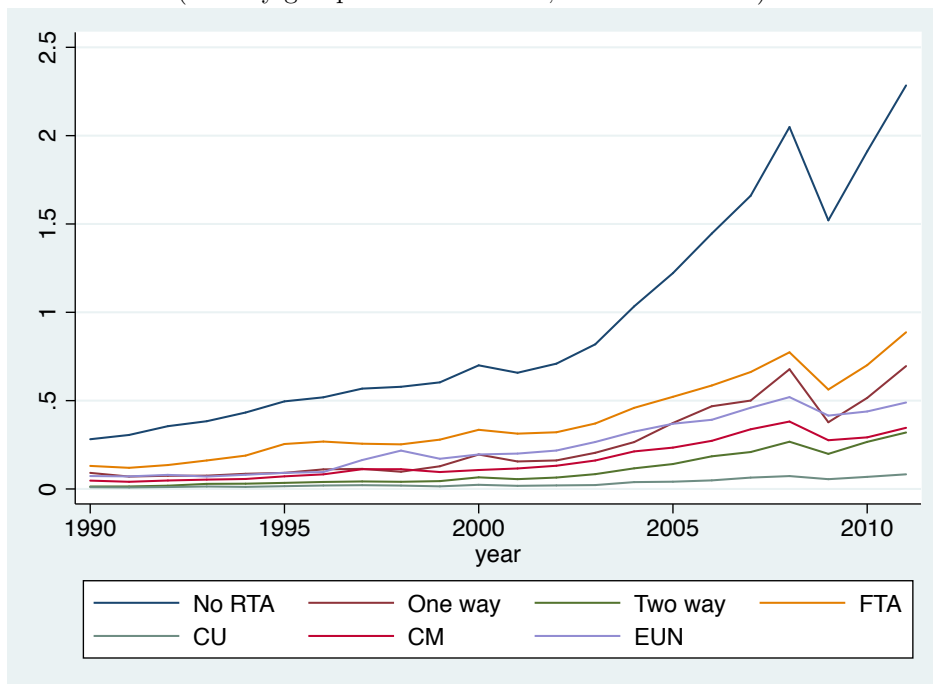
Figure 5: Distribution of bilateral trade imbalances
(as a share of bilateral trade, count)
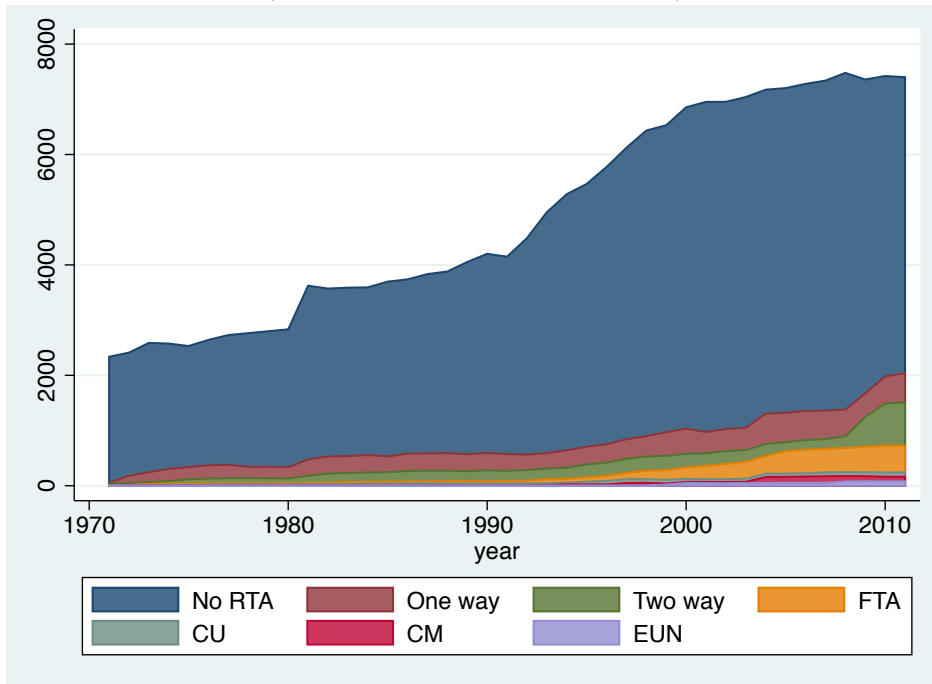
Figure 6: Bilateral trade imbalances
(mean value, RTA relationship as in 2010)
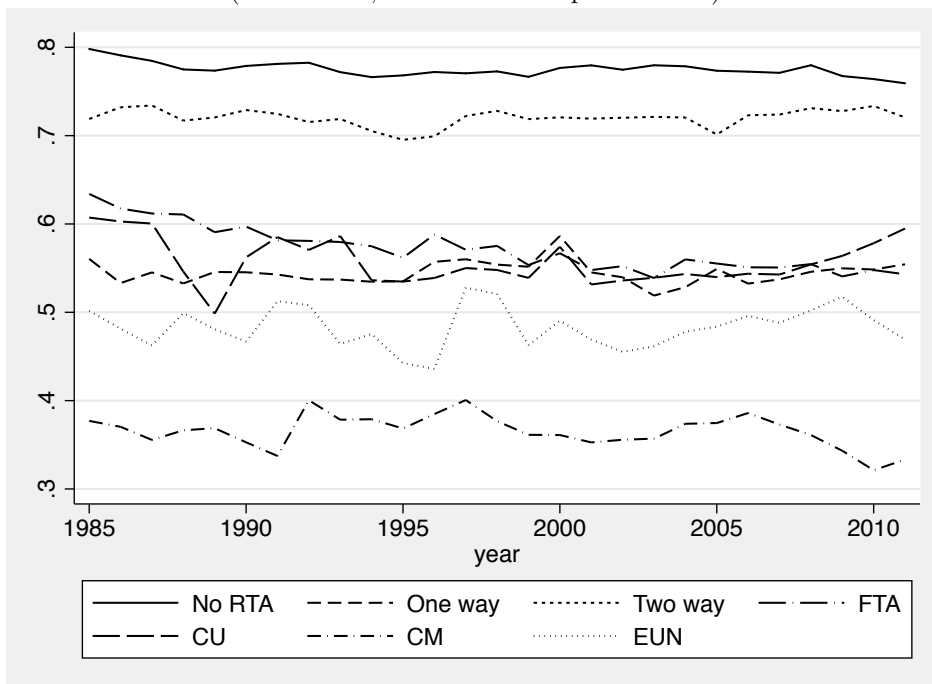
Figure 7: Bilateral trade imbalances
(median value, RTA relationship as in 2010)
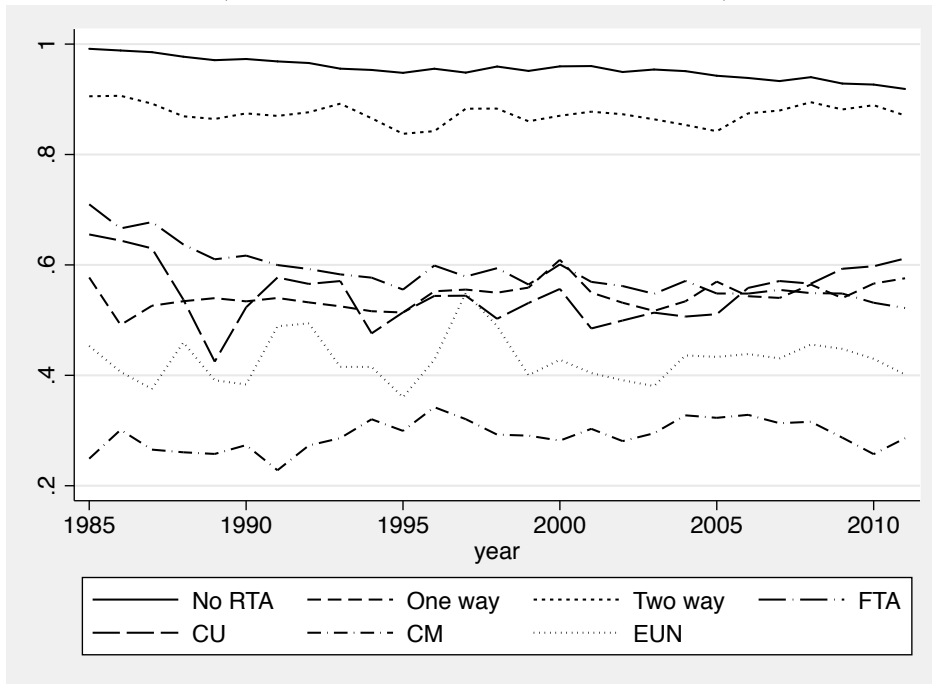
Figure 8: Bilateral trade imbalances
(interquartile range, RTA relationship as in 2010)
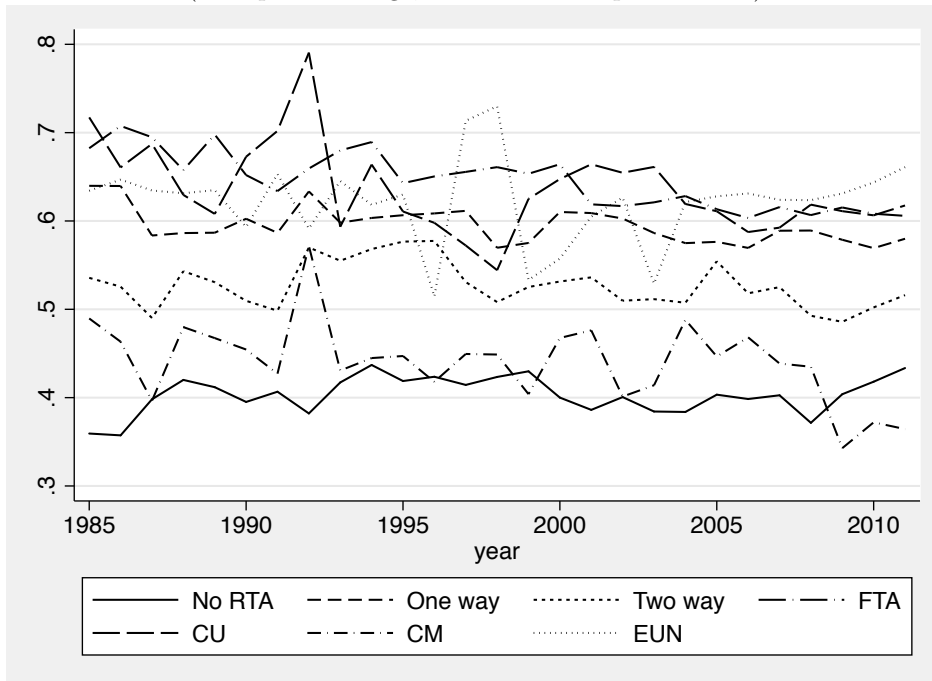
Figure 9: Average GDP-weighted RTA-associated aggregate trade imbalances (1990=1)
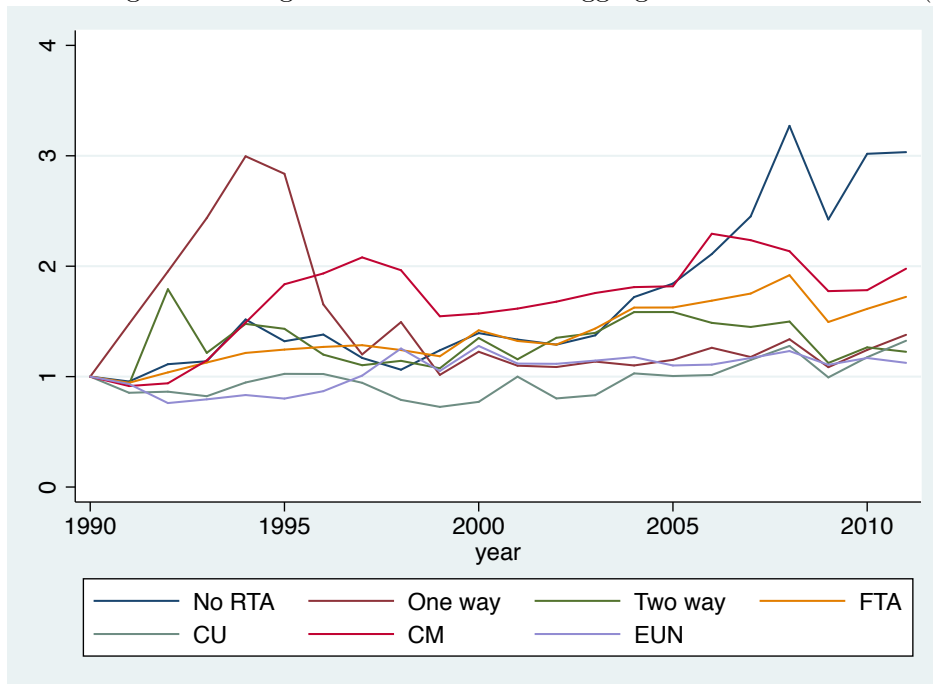
Figure 10: Bilateral trade imbalances before and after RTA enactment
(absolute size of imbalance)
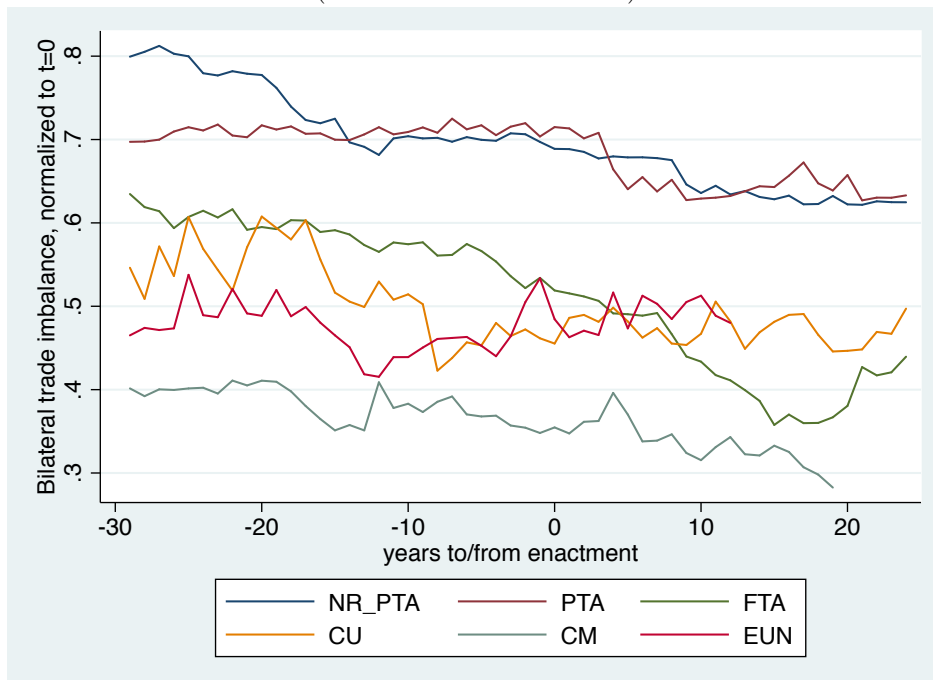
Figure 11: Bilateral trade imbalances before and after RTA enactment
(normalized to the imbalance at t=0 (date of enactment))
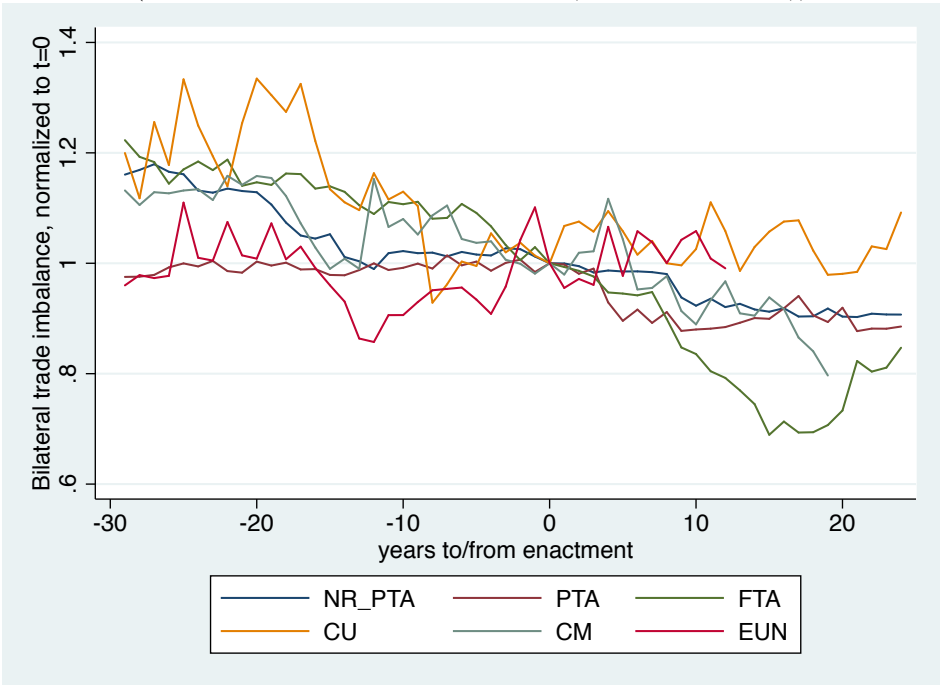
Figure 12: Dynamics of bilateral trade imbalances before and after RTA enactment
(by the type of RTA, not normalized)
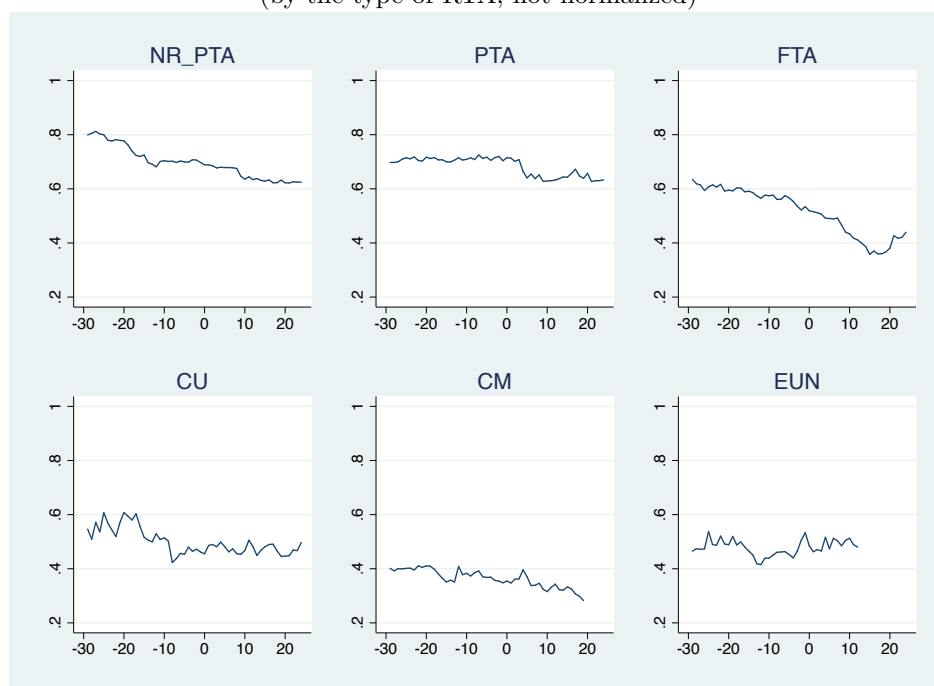
Table 3: 10 year volatility of bilateral trade imbalances by country types

Type of country pair	before-RTA	after RTA
AM, AM	0.145	0.105
AM, EME	0.184	0.127
AM, LIC	0.174	0.076
EME, EME	0.215	0.163
EME, LIC	0.199	0.189
LIC, LIC	0.191	0.176

Table 4: RTAs by the order of enaction

From- To	None	NR_PTA	PTA	FTA	CU	CM	EUN
None	17024	4408	2119	1675	129	45	22
NR_PTA		3581	1070	289	8	3	
PTA			2599	575	86	38	
FTA				1968	168	528	
CU					305	92	56
CM						92	56

Table 5: RTAs by the order of breaking up

From- To	None	NR_PTA	PTA	FTA	CU	CM	EUN
NR_PTA	300						
PTA	135	3					
FTA	8	6	20				
CU	20						

Figure 13: Diversion measure $Div2$
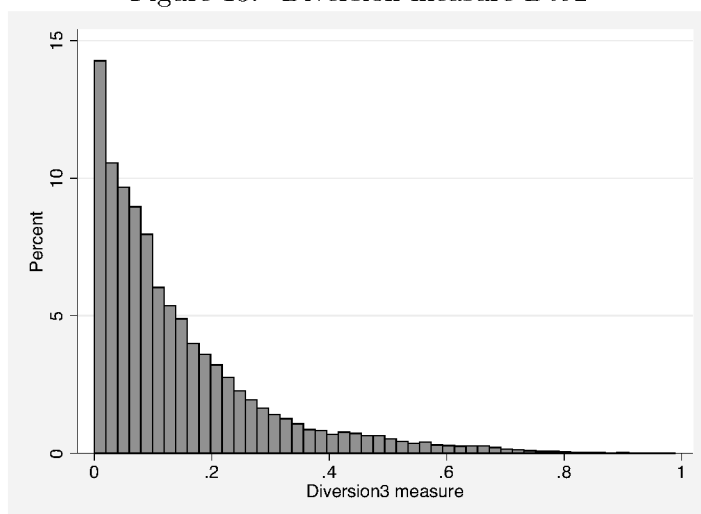
Figure 14: Results of the main specification
(95% CIs)

44
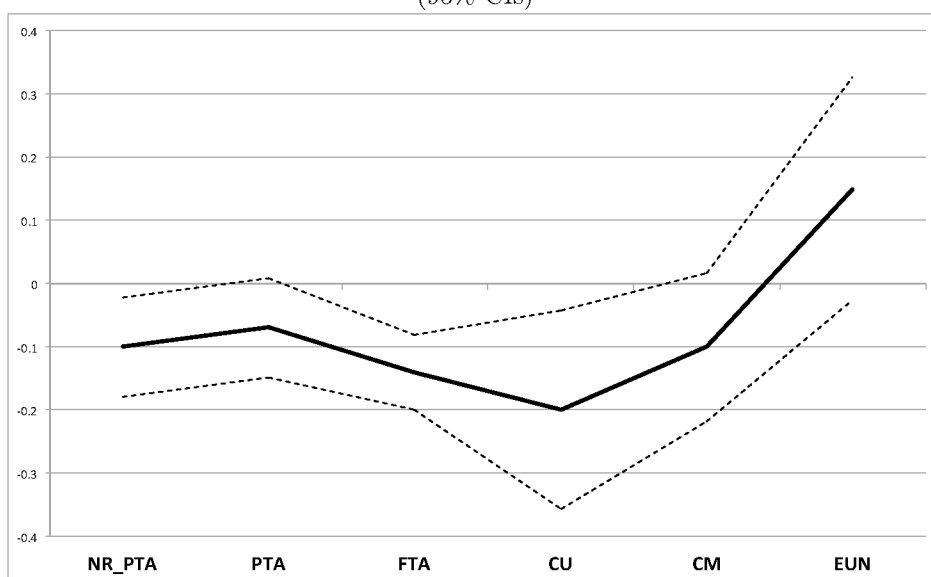
Table 6: Main results: imbalance 1

VARIABLES	(1) Imb1	(2) Imb1	(3) Imb1	(4) Imb1
RTA	-0.07***	-0.12***		
	(0.02)	(0.03)		
lag_RTA		-0.02		
		(0.01)		
NR_PTA			-0.10***	-0.16**
			(0.04)	(0.04)
lag_NR_PTA				0.11***
				(0.03)
PTA			-0.07*	-0.07*
			(0.04)	(0.04)
lag_PTA				0.00
				(0.03)
FTA			-0.14***	-0.15***
			(0.03)	(0.04)
lag_FTA				0.00
				(0.03)
CU			-0.20***	-0.26***
			(0.08)	(0.08)
lag_CU				0.12
				(0.08)
CM			-0.10	-0.12*
			(0.06)	(0.06)
lag_CM				0.08*
				(0.05)
EUN			0.15*	0.14
			(0.09)	(0.09)
lag_EUN				0.03
				(0.07)
lag_Imb1	0.93***	0.93***	0.93***	0.93***
	(0.03)	(0.03)	(0.03)	(0.03)
contig	-0.05	-0.05	-0.06	-0.05
	(0.05)	(0.05)	(0.05)	(0.05)
comlang_off	-0.13***	-0.13***	-0.13***	-0.13***
	(0.03)	(0.03)	(0.03)	(0.03)
comleg	-0.07***	-0.07***	-0.07***	-0.07***
	(0.02)	(0.02)	(0.02)	(0.02)
comrelig	-0.18***	-0.19***	-0.19***	-0.19***
	(0.04)	(0.04)	(0.04)	(0.04)
l_distw	0.17***	0.17***	0.17***	0.17***
	(0.01)	(0.01)	(0.01)	(0.01)
colony	-0.04	-0.04	-0.04	-0.04
	(0.06)	(0.06)	(0.06)	(0.06)
curcol	-0.11	-0.11	-0.11	-0.11
	(0.16)	(0.16)	(0.16)	(0.16)
col45	-0.13	-0.13*	-0.13	-0.13*
	(0.08)	(0.08)	(0.08)	(0.08)
Constant	-1.40***	-1.41***	-1.39**	-1.40**
	(0.59)	(0.58)	(0.58)	(0.56)
Observations	29,612	29,612	29,612	29,612
type	ALL	ALL	ALL	ALL
Exporter-Year FE	YES	YES	YES	YES
Importer-Year FE	YES	YES	YES	YES

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.
Dependent variable - share of net exports in total bilateral trade: $Imbalance1_{ijt} = Abs\left((EXP_{ijt} - IMP_{ijt})/(EXP_{ijt} + IMP_{ijt})\right)$.

Table 7: Main results: Imbalance 1 with Diversion measure 1

VARIABLES	(1) Imb1	(2) Imb1	(3) Imb1	(4) Imb1
RTA	-0.09***	-0.09***		
	(0.02)	(0.03)		
lag_RTA		-0.00		
		(0.02)		
Div1_RTA	-0.01	-0.02	0.01	0.03
	(0.03)	(0.04)	(0.06)	(0.06)
lag_Div1_RTA		-0.01	-0.07**	
		(0.03)	(0.04)	
NR_PTA			-0.09	-0.18
			(0.07)	(0.07)
lag_NR_PTA				0.21***
				(0.05)
PTA			-0.05	-0.03
			(0.03)	(0.04)
lag_PTA				-0.06*
				(0.03)
FTA			-0.13***	-0.12***
			(0.03)	(0.04)
lag_FTA				-0.03
				(0.03)
CU			-0.21***	-0.22***
			(0.07)	(0.08)
lag_CU				0.03
				(0.07)
CM			-0.10	-0.10
			(0.06)	(0.07)
lag_CM				0.06
				(0.06)
EUN			0.16**	0.17***
			(0.08)	(0.09)
lag_EUN				-0.01
				(0.08)

Table 7 continues on the next page

	Continuation of table 7			
	(1)	(2)	(3)	(4)
$Imb1_{t-1}$	0.93***	0.93***	0.91***	0.91***
	(0.02)	(0.03)	(0.02)	(0.02)
contig	-0.04	-0.02	-0.05	-0.05
	(0.04)	(0.04)	(0.04)	(0.04)
comlang_off	-0.15***	-0.14***	-0.13***	-0.13***
	(0.02)	(0.03)	(0.02)	(0.02)
comleg	-0.10***	-0.09***	-0.07***	-0.07***
	(0.02)	(0.02)	(0.02)	(0.02)
comrelig	-0.21***	-0.23***	-0.20***	-0.20***
	(0.03)	(0.04)	(0.03)	(0.03)
l_distw	0.16***	0.16***	0.16***	0.16***
	(0.01)	(0.01)	(0.01)	(0.01)
colony	-0.01	-0.03	-0.04	-0.04
	(0.05)	(0.06)	(0.05)	(0.05)
curcol	-0.08	-0.09	-0.15	-0.16
	(0.15)	(0.17)	(0.16)	(0.16)
col45	-0.15**	-0.13*	-0.12	-0.12
	(0.07)	(0.08)	(0.07)	(0.07)
Constant	0.96***	0.99***	0.97***	0.97***
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	29,819	24,857	29,791	29,791
Exporter-Year FE	YES	YES	YES	YES
Importer-Year FE	YES	YES	YES	YES

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.
Dependent variable - share of net exports in total bilateral trade: $Imbalance1_{ijt} = Abs\left((EXP_{ijt} - IMP_{ijt})/(EXP_{ijt} + IMP_{ijt})\right)$. Diversion measure $Div1$ relates to one of the countries in the pair ij having an RTA (of any type) when there is no RTA relationship between the ij pair.

Table 8: Results: Imbalance 1 with diversion measure $Div2$

VARIABLES	(1) Imb1	(2) Imb1	(3) Imb1	(4) Imb1
RTA	-0.12***	-0.25***		
	(0.02)	(0.04)		
RTA×Div2		0.50***		
		(0.10)		
Div2	-3.76***	-3.45***	-4.04***	-3.03***
	(0.62)	(0.62)	(0.63)	(0.65)
NR_PTA			-0.11***	-0.03
			(0.04)	(0.08)
NR_PTA×Div2				-0.04
				(0.18)
PTA			-0.09***	-0.15***
			(0.03)	(0.06)
PTA×Div2				0.29
				(0.18)
FTA			-0.15***	-0.31***
			(0.03)	(0.06)
FTA×Div2				0.63***
				(0.16)
CU			-0.30***	-0.70***
			(0.07)	(0.10)
CU×Div2				1.35***
				(0.24)
CM			-0.19***	-0.50***
			(0.07)	(0.15)
CM×Div2				0.77***
				(0.26)
EUN			0.13	-0.19
			(0.08)	(0.14)
EUN×Div2				0.83***
				(0.26)
lag_imb1	0.93***	0.92***	0.93***	0.92***
	(0.02)	(0.02)	(0.02)	(0.02)
contig	-0.10**	-0.09**	-0.12***	-0.09**
	(0.04)	(0.04)	(0.04)	(0.04)
comlang_off	-0.15***	-0.15***	-0.15***	-0.14***
	(0.02)	(0.02)	(0.02)	(0.02)
comleg	-0.10***	-0.10***	-0.10***	-0.10***
	(0.02)	(0.02)	(0.02)	(0.02)
comrelig	-0.21***	-0.21***	-0.21***	-0.21***
	(0.03)	(0.03)	(0.03)	(0.03)
l_distw	0.17***	0.17***	0.16***	0.16***
	(0.01)	(0.01)	(0.01)	(0.01)
colony	-0.01	-0.02	-0.01	-0.00
	(0.05)	(0.05)	(0.05)	(0.05)
curcol	-0.10	-0.11	-0.11	-0.09
	(0.15)	(0.15)	(0.15)	(0.15)
col45	-0.14*	-0.14*	-0.15**	-0.15**
	(0.07)	(0.07)	(0.07)	(0.07)
Constant	-6.31	-2.08	-0.26	-6.24
	(14.12)	(1.31)	(1.56)	(13.49)
Observations	29,819	29,819	29,819	29,819

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.
Dependent variable - share of net exports in total bilateral trade: $Imbalance1_{ijt} = \frac{EXP_{ijt}-IMP_{ijt}}{/} EXP_{ijt} + IMP_{ijt}.$
Only positive imbalances are considered. The joint weighted diversion measure $Div2$ represents the measure of RTA-related trade in the overall trade of the country pair excluding their trade.

Table 9: Marginal Effects of Regression (3) estimation in Table 6

	discrete change		z	P $|z|$
	coef	se	coef	se
NR_PTA	-0.0063	0.005	-1.26	0.206
PTA	-0.0106	0.006	-1.70	0.089
FTA	-0.0314	0.005	-6.00	0.000
CU	-0.0791	0.125	-5.53	0.000
CM	-0.0515	0.009	-5.53	0.000
EUN	0.0325	0.013	2.57	0.010

Table 10: First Differences Regression

VARIABLES	(1) ΔImb1	(2) ΔImb1	(3) ΔImb1	(4) ΔImb1
ΔRTA	-0.01* (0.01)		0.02 (0.01)	
ΔRTA#$Imb1_{t-1}$			-0.05*** (0.02)	
ΔNR_PTA		-0.06*** (0.01)		-0.01 (0.02)
ΔNR_PTA#$Imb1_{t-1}$				-0.09*** (0.03)
ΔPTA		-0.01 (0.01)		0.04* (0.02)
ΔPTA#$Imb1_{t-1}$				-0.07** (0.03)
ΔFTA		-0.02* (0.01)		-0.01 (0.02)
ΔFTA#$Imb1_{t-1}$				-0.02 (0.03)
ΔCU		-0.01 (0.03)		-0.02 (0.04)
ΔCU#$Imb1_{t-1}$				0.05 (0.08)
ΔCM		-0.04* (0.02)		-0.07* (0.04)
ΔCM#$Imb1_{t-1}$				0.07 (0.07)
ΔEUN		0.02 (0.04)		-0.07 (0.06)
ΔEUN#$Imb1_{t-1}$				0.19* (0.10)
$Imb1_{t-1}$	-0.14*** (0.01)	-0.14*** (0.01)	-0.13*** (0.01)	-0.13*** (0.01)
Constant	0.07 (0.30)	0.07 (0.30)	0.06 (0.30)	0.07 (0.30)
Observations	30,668	30,668	30,668	30,668
R-squared	0.16	0.16	0.16	0.16
type	ALL	ALL	ALL	ALL
Exporter-Year FE	YES	YES	YES	YES
Importer-Year FE	YES	YES	YES	YES

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.
Dependent variable - change in share of net exports in total bilateral trade:
$\Delta Imbalance1_{ijt} = \left(\frac{EXP_{ijt}-IMP_{ijt}}{EXP_{ijt}+IMP_{ijt}} - \frac{EXP_{ij,t-1}-IMP_{ij,t-1}}{EXP_{ij,t-1}+IMP_{ij,t-1}} \right)$. Only the positive side of the distribution of imbalances (as in the main regression).

Table 11: Robustness checks: imbalance 2

VARIABLES	(1) imb2	(2) imb2	(3) imb2	(4) imb2
RTA	-0.03	-0.09***		
	(0.04)	(0.03)		
NR_PTA			-0.16**	-0.14***
			(0.06)	(0.05)
PTA			0.02	-0.04
			(0.05)	(0.04)
FTA			0.00	-0.10**
			(0.05)	(0.04)
CU			0.07	-0.19**
			(0.11)	(0.09)
CM			-0.10	-0.19**
			(0.10)	(0.08)
EUN			0.15	0.14
			(0.13)	(0.11)
contig		-0.04		-0.06
		(0.08)		(0.08)
comlang_off		-0.37***		-0.37***
		(0.04)		(0.04)
comrelig		-0.42***		-0.42***
		(0.06)		(0.06)
l_distw		0.30***		0.30***
		(0.02)		(0.02)
Constant	1.97***	0.05	1.98***	0.06
	(0.03)	(1.60)	(0.03)	(1.60)
Observations	45,030	45,030	45,030	45,030
R-squared	0.18		0.18	
Number of d_p1p2	13,594	13,594	13,594	13,594
ImporterTime, ExporterTime FE	YES	YES	YES	YES
Pair Effects	FE	RE	FE	RE

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12: Robustness checks: imbalance 3 (aggregate)

Sample	Full	advanced	emerging	low-income
	(1)	(2)	(3)	(4)
VARIABLES	imb3	imb3	imb3	imb3
NR_PTA	-0.007***	0.000	-0.005***	-0.011***
	(0.001)	(0.001)	(0.001)	(0.001)
PTA	0.006***	-0.007***	0.001	0.021***
	(0.001)	(0.001)	(0.002)	(0.002)
FTA	-0.007***	-0.002*	-0.010***	-0.019***
	(0.001)	(0.001)	(0.002)	(0.003)
CU	-0.006***	-0.001	-0.006**	-0.025***
	(0.002)	(0.001)	(0.003)	(0.004)
CM	0.002	0.002	-0.025**	0.006
	(0.003)	(0.002)	(0.011)	(0.010)
EUN	-0.011***	-0.011***	-0.176***	0.016***
	(0.003)	(0.003)	(0.015)	(0.006)
Constant	-0.008***	-0.003***	-0.004***	-0.015***
	(0.000)	(0.000)	(0.001)	(0.001)
Observations	58,969	13,734	24,316	20,919
R-squared	0.301	0.236	0.289	0.332
CoutryTime FE	YES	YES	YES	YES

Standard errors in parentheses

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

Table 13: Robustness checks: subsamples by types of RTA

VARIABLES	(1) imb2	(2) imb2	(3) imb2	(4) imb2	(5) imb2	(6) imb2
NR_PTA	-0.09					
	(0.06)					
PTA		-0.03				
		(0.05)				
FTA			-0.12**			
			(0.05)			
CU				-0.24**		
				(0.12)		
CM					-0.11	
					(0.11)	
EUN						0.21
						(0.14)
contig	-0.07	-0.12	-0.09	-0.02	-0.07	0.02
	(0.10)	(0.09)	(0.09)	(0.10)	(0.10)	(0.10)
comlang_off	-0.30***	-0.34***	-0.37***	-0.34***	-0.32***	-0.34***
	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
comrelig	-0.43***	-0.40***	-0.41***	-0.37***	-0.38***	-0.37***
	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
l_distw	0.29***	0.29***	0.26***	0.29***	0.28***	0.31***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)
Constant	0.10	-0.23	0.04	-0.27	-0.12	-0.36
	(1.65)	(1.75)	(1.71)	(1.75)	(1.74)	(1.74)
Observations	38,183	35,538	35,761	33,698	33,796	34,048
Number of d_p1p2	12,559	11,857	11,860	11,495	11,566	11,567
ImporterTime, ExporterTime FE	YES	YES	YES	YES	YES	YES
Pair Effects	RE	RE	RE	RE	RE	RE

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 14: Results on the volatility of bilateral trade imbalances

VARIABLES	(1) volat5	(2) volat5	(3) volat5	(4) volat5	(5) volat5
RTA	-0.05*** (0.00)	-0.03*** (0.00)			
lag_RTA		-0.03*** (0.01)			
NR_PTA			-0.02*** (0.01)		-0.01 (0.01)
lag_NR_PTA				-0.03*** (0.01)	-0.02*** (0.01)
PTA			-0.04*** (0.01)		-0.03*** (0.01)
lag_PTA				-0.04*** (0.01)	-0.02** (0.01)
FTA			-0.08*** (0.01)		-0.06*** (0.01)
lag_FTA				-0.08*** (0.01)	-0.04*** (0.01)
CU			-0.10*** (0.01)		-0.07*** (0.02)
lag_CU				-0.09*** (0.01)	-0.05*** (0.02)
CM			-0.05*** (0.01)		-0.02 (0.02)
lag_CM				-0.05*** (0.01)	-0.05*** (0.02)
EUN			-0.07*** (0.01)		-0.03 (0.02)
lag_EUN				-0.05*** (0.02)	-0.05* (0.03)
Constant	0.24*** (0.00)	0.24*** (0.00)	0.23*** (0.00)	0.23*** (0.00)	0.24*** (0.00)
Observations	160,693	148,380	160,693	148,380	148,380
R-squared	0.11	0.10	0.11	0.10	0.10
Number of d_p1p2	26,326	26,326	26,326	26,326	26,326
type	ALL	ALL	ALL	ALL	ALL

Standard errors in parentheses
*** p¡0.01, ** p¡0.05, * p¡0.1

A   Appendix

A.1   Deepening of RTAs

I have referred several times to the "deepening" of the RTAs. Table 1 provides the evidence on the number of the total country-pairs engaged into the RTA-relationship by type, and shows that the numbers indeed follow somehow a cascading pattern reflecting the deepening of the overall trade relationships - the more common the less integrative RTAs became, the more deeper forms of RTAs emerged. But this table does not show whether this can be seen as an evolution in terms of the existent RTA relationship, or it is merely an "broadening" of the new RTAs. For the deepening as I refer to it, both of this relationships should exist, while the deeper RTAs occuring on the basis of the more shallow RTAs, and the new RTAs emerging first in the less deep relationship. In this section I briefly discuss this evolution in RTAs with the goal to persuade the reader that we can indeed see the "deepening" pattern.

Table 4 shows the order of enaction of the RTAs. It indicates, that there is 17024 country pairs that has not ever had any type of RTA-relation, while 4408 country pairs that used to not have any RTA relationship have enacted non-reciprocal PTA (GSP under WTO), of which 3581 have remained under this type of relation (as in 2010). Of the country pairs that had NR_PTA in place, 1070 went on to have a PTA, while 2119 went from not having any RTA to having a PTA directly.

Following the given statistic in table 4 one could conclude that there is no clear deepeing pattern at first. The following facts/observations should be noted then:

1. NR_PTA is not actually a separate agreement, rather it is a special type of concessions to developing countries under the WTO arrangement - therefore, even if it represents a certain type of integration between the countries, it excludes all developed countries and is not an integration "by choice"

2. CU, CM, EUN that were enacted between country pairs that had no relationship before, are predominantly by low-income and small countries (data of countries by type in table

   (a) 22 EUN relationships are enacted within the low-income and small african economies

   (b) 45 CM are actually associated with Cyprus and Malta entering the EU which by 2004 and 2007 had countries that had no formal trade agreement with them (Lithuania, Latvia, Slovakia, Island, etc..)

3. CUs that were enacted between the countries that used to have no agreement between them, are dated back to third quarter of the 20th century (and also the fall of the USSR); the newer are the ones that join low-income countries[30]

4. FTAs were initiated by the (now) advanced economies, and gained their popularity between other countries; throughout time the negotiations for FTAs started having more detailed and nuanced character and involve more sophisticated dispute resolution mechanisms (Usually WTO DSU)

Another evidence for the more robust and binding nature of the deeper trade agreements is that they rarely fall apart - table 5 provides the statistics. There has been known only one episode of the Customs Union falling apart - the 1970 Central American Common Market (CACM1) - as a result of war and unrest between 5 Central American countries.

Altogether, there is solid evidence that the trade relationship tends to "deepen" between the country pairs.

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[30]The statistics by year and the type of countries that joined CU is available in tables 16

Imbalance 2

The measure *Imbalance*2 is a ratio, there are two possible processes that can lead to the decrease of it: increase in the denominator and decrease in the numerator. Under the common increase in trade effect of RTA, there are two possible processes that can lead to this, indicated in table 15. Estimating this at the bilateral level without allowing random coefficients (thus allowing for the differences between all country pairs influence the ratio of a given country pair) will be economically meaningless - as illustrated in the example below.

Consider an example: there are three countries i, j and k that sign a (give type of) RTA. Same RTA will be reducing the trade imbalances between them by having a different effect on the bilateral level: for instance, if two of the bilateral trade imbalances see the decrease because of (case2) relation, it could (and if we assume only three countries, would) be the (case 3) relation for the third country. Therefore, while looking only at one side of the distribution of the imbalances, the random coefficient estimates should be used.

Table 15: Imbalance 2

Initial ratio	Change when RTA is enacted	
	$\uparrow \triangle Exp_{ij} > \uparrow \triangle Imp_{ij}$	$\uparrow \triangle Exp_{ij} < \uparrow \triangle Imp_{ij}$
$\frac{Exp_{ij}}{Imp_{ij}} > 0$	(case 1) ratio increases	(case 2) ratio falls
$\frac{Exp_{ij}}{Imp_{ij}} < 0$	(case 3) ratio falls	(case 4) ratio increases

A.2 List of Trade Agreements (replicated from Bergstrand dataset)

Economic Unions

Euro Area (1999): Austria, Belgium, Cyprus (2008), Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta (2008), Netherlands, Portugal, Slovak Republic (2008), Slovenia (2008), Spain
West African Economic and Monetary Union (UEMOA/WAEMU) (2000): Benin, Burk- ina Faso, Guinea-Bissau, Ivory Coast, Mali, Niger, Senegal, Togo
Economic and Monetary Community of Central Africa (CEMAC) (2000): Cameroon, Central African Republic, Chad, Equatorial Guinea, Gabon

Table 16: Distribution of years when country pairs that had no RTAs enacted a Customs Union

Year	Total	AM	EME	LIC
1973	28	28	0	0
1981	14	14	0	0
1984	21	0	16	5
1986	10	10	0	0
1996	25	1	19	5
2004	4	2	2	0
2007	25	0	8	17
2010	2	0	2	0

Common Markets

European Economic Area (EEA) (1993): Austria (1994), Belgium, Bulgaria (2007), Cyprus (2005), Czech Republic (2005), Denmark, Estonia (2005), Finland (1994), France, Germany, Greece, Hungary (2005), Iceland (1994), Ireland, Italy, Latvia (2005), Lithuania (2005), Luxembourg, Malta (2005), Netherlands, Norway (1994), Poland (2005), Portugal, Romania (2007), Slovak Republic (2005), Slovenia (2005), Spain, Sweden (1994), UK
East African Community (EAC) (2001): Burundi (2008), Kenya, Rwanda (2008), Tanzania, Uganda

Customs Union

Andean Community 1 (1995): Bolivia, Colombia, Ecuador, Peru, Venezuela
Caribbean Community and Common Market (CARICOM) (1975): Antigua And Bar- buda, Bahamas (1984), Barbados, Belize, Dominica, Grenada, Guyana, Haiti (2003), Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname (1996), Trinidad and Tobago
Central American Common Market (CACM1) (1966-1969): Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua
Eurasian Economic Community (EURASIAN) (2010): Belarus, Kazakhstan, Russia
European Economic Community (EEC) (1962-1992): Belgium, Denmark (1973), France, Germany, Greece (1981), Ireland (1973), Italy, Luxembourg, Netherlands, Portugal (1986), Spain (1986), UK (1973)
European Union Customs Union (EUCU): EU-San Marino (1993), EU-Cyprus (1993)
Gulf Cooperation Council Customs Union (GCCCU) (2003): Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates
Mercado Comn del Sur (MERCOSUR) (1995): Argentina, Brazil, Paraguay, Uruguay
Southern African Customs Union (SACU) (1970): Botswana, Lesotho, Namibia (1990), South Africa, Swaziland
West African Economic and Monetary Union (WAEMU) (1995-1999): Benin, Burkina Faso, Guinea-Bissau (1997), Ivory Coast, Mali, Niger, Senegal, Togo
Czech Republic-Slovak Republic (1993-2004)

Free Trade Agreements

1. Plurilateral Agreements
Andean Community 2 (1993-1994): Bolivia, Colombia, Ecuador, Venezuela
Arab Common Market (ACM) (1965): Egypt, Iraq, Syria, Yemen
ASEAN-ANZERTA (2010): Australia, New Zealand and ASEAN members
Association of Southeast Asian Nations (ASEAN) (2000): Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar (Burma), Philippines, Singapore, Thailand, Vietnam
Baltic FTA (BAFTA 1999-2004): Estonia , Latvia, Lithuania
Caribbean Free Trade Agreement (CARIFTA) (1968-1974): Antigua and Barbuda, Barbados, Belize (1971), Dominica, Grenada, Guyana, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago
Central American Common Market (CACM2) (1951-1965): Costa Rica (1963), El Salvador, Guatemala (1955), Honduras (1957), Nicaragua
Central American Common Market (CACM3) (1993): Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua
Central European Free Trade Area (CEFTA) (1993): Albania (2007), Bosnia and Herzegovina (2007), Bulgaria (1999-2006), Croatia (2003), Czech Republic (until 2004), Hungary (1993-2004), Macedonia (2006), Moldova (2007), Poland (until 2004), Romania (1997-2006), Slovak Republic (1993-2004), Slovenia (1996-2004)
Colombia -Northern Triangle FTA: Colombia, Mexico, El Salvador, Guatemala, Honduras
Common Market for Eastern and Southern Africa (COMESA) (2001): Burundi (2005), Comoros (2006), Congo D.R., Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya (2006), Madagascar, Malawi, Mauritius, Rwanda (2005), Seychelles, Swaziland, Uganda, Sudan
Dominican Republic-Central America-United States FTA (2006) (CAFTA-DR): Costa Rica (2009), Dominican Republic (2007), El Salvador, Guatemala (2007), Honduras, Nicaragua, United States
European Free Trade Association (EFTA 1960): Austria (until 1995), Denmark (until 1973), Finland (1986-1995), Iceland (1970), Norway, Portugal (until 1986), Sweden (until 1995), Switzerland, United Kingdom (until 1973)
European Union (EU) (1958): Austria (1995), Belgium, Bulgaria (2007), Cyprus (2004), Czech Republic (2004), Denmark (1973), Estonia (2004), Finland (1995), France, Germany, Greece (1981), Hungary (2004), Ireland (1973), Italy, Latvia (2004), Lithuania (2004), Luxembourg, Malta (2004), Netherlands, Poland (2004), Portugal (1986), Slovak Republic (2004), Slovenia (2004), Spain (1986), Sweden (1995), United Kingdom (1973)
Gulf Cooperation Council (GCCFTA)(1983-2002): Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates
NAFTA (North American Free Trade Agreement 1994): Canada, Mexico, US
Pan-Arab Free Trade Area (1998) (PAFTA/GAFTA): Algeria (2009), Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon (1999), Libya (1999), Morocco, Oman, Palestine (2005), Qatar, Saudi Arabia, Sudan (2005), Syria, Tunisia, United Arab Emirates, Yemen (2005)
Pacific Island Countries Trade Agreements (2003) (PICTA): Fiji, Kiribati, Papua New Guinea, Solomon Islands, Tonga, Samoa
South Asian Free Trade Area (SAFTA)(2006): Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka
Southern African Development Community (SADC) (2001): Botswana, Congo D.R., Lesotho, Madagascar, Malawi (2009), Mauritius, Mozambique (2009), Namibia, South Africa, Swaziland, Tanzania (2009), Zambia, Zimbabwe
Trans-Pacific Partnership (TPP) (2006): Brunei, Chile, New Zealand, Singapore

West African Monetary Union (WAMU) (1962-1965): Burkina Faso, Mali, Mauritania, Niger, Senegal

2. Bilateral Agreements
Albania-Bosnia and Herzegovina (2004-2006)
Albania-Croatia (2004-2006)
Albania-Macedonia (2003-2006)
Albania-Macedonia (2003-2006)
Albania-Romania (2004)
Andean Community 1-Chile (2005)
Andean Community 1-MERCOSUR (2005)
Angola-Egypt (2001)
Armenia-Georgia (1999)
Armenia-Kazakhstan (2002)
Armenia-Kyrgyz Republic (1996)
Armenia-Moldova (1996)
Armenia-Russia (1993)
Armenia-Turkmenistan (1997)
Armenia-Ukraine (1997)
ASEAN-China (2006)
ASEAN-India (2010)
ASEAN-Japan (2008)
ASEAN-South Korea (2007)
Australia-Chile (2009)
Australia-New Zealand (1983-2009)
Australia-Papua New Guinea (1977)
Australia-Singapore (2003-2009)
Australia-Thailand (2005-2009)
Australia-USA (2005)
Azerbaijan-Georgia (1997)
Azerbaijan-Russia (1993)
Azerbaijan-Ukraine (1997)
Bahrain-USA (2007)
Belarus-Russia (1993-2009)
Belarus-Ukraine (2007)
Bolivia-Chile (1996-2004)
Bolivia-Mexico (1995)
Bosnia and Herzegovina-Bulgaria (2005)
Bosnia and Herzegovina-Croatia (2001-2006)
Bosnia and Herzegovina-Macedonia, (2003-2005)
Bosnia and Herzegovina-Moldova (2005-2006)
Bosnia and Herzegovina-Romania (2004-2006)
Bosnia and Herzegovina-Slovenia (2002-2003)
Bulgaria-Israel (2002-2006)
Bulgaria-Macedonia (2000-2006)
Bulgaria-Moldova (2004)
CACM3-Dominican Republic (1998)
CACM3-Mexico (2001)
Cameroon-Gabon (1966-1999)
Canada-Chile (1997)
Canada-Israel (1997)
Canada-Peru (2010)
Canada-USA (1989-1993)
CARICOM-Costa Rica (2004)
CARICOM-Dominican Republic (1998)
CEFTA-Bulgaria (1993-1998)
Chile-China (2007)
Chile-Costa Rica (2002)
Chile-El Salvador (2003)
Chile-Japan (2008)
Chile-Korea (2004)
Chile-Mexico (2000)
Chile-Panama (2008)
Chile-USA (2004)
China-Costa Rica (2010)
China-Hong Kong (2004)
China-Macao (2004)
China-New Zealand (2009)
China-Nicaragua (2007)
China-Pakistan (2008)
China-Peru (2010)

Colombia-Mexico (1995-2009)
COMESA-SADC (2006)
Congo, Republic of-Gabon (1966)
Costa Rica-Mexico (1995-2000)
Croatia-Macedonia (2004)
Czech Republic-Estonia (1997)
Czech Republic-Israel (1997-2004)
Czech Republic-Latvia (1997-2004)
Czech Republic-Lithuania (1997-2004)
Czech Republic-Romania (1997-2006)
EEC-Israel (1975-1992)
EEA-Israel (1993)
EFTA-Albania (2010)
EFTA-Bulgaria (1994-2006)
EFTA-Canada (2010)
EFTA-Chile (2005)
EFTA-Croatia (2002)
EFTA-Czech Republic (1994-2004)
EFTA-Egypt (2007)
EFTA-Estonia (1997-2004)
EFTA-GCCCU (2009)
EFTA-Hungary (1994-2004)
EFTA-Israel (1993)
EFTA-Jordan (2002)
EFTA-Latvia (1996-2004)
EFTA-Lebanon (2007)
EFTA-Lithuania (1997-2004)
EFTA-Macedonia (2001)
EFTA-Mexico (2002)
EFTA-Morocco (2000)
EFTA-Poland (1994)
EFTA-Romania (1994-2006)
EFTA-SACU (2008)
EFTA-Singapore (2003)
EFTA-Slovak Republic (1993-2004)
EFTA-Slovenia (1995-2004)
EFTA-South Korea (2007)
EFTA-Tunisia (2005)
Egypt-Jordan (1999)
El Salvador-Panama (2003)
Estonia-Hungary (1999-2004)
Estonia-Slovak Republic (1997-2004)
Estonia-Slovenia (1997-2004)
EU-Algeria (2005)
EU-Bulgaria (1994-2006)
EU-Chile (2005)
EU-Croatia (2003)
EU-Cyprus (1988-2004)
EU-Czech Republic (1992-2004)
EU-EFTA (Agreement/European Economic Area 1973/1994)
EU-Egypt (2005)
EU-Estonia (1998-2004)
EU-Faroe Islands (1997)
EU-Hungary (1992-2004)
EU-Israel (2000)
EU-Jordan (2002)
EU-Lativa (1995-2004)
EU-Lebanon (2003)
EU-Lithuania (1995-2004)
EU-Macedonia (2002)
EU-Mexico (1998)
EU-Morocco (2001)
EU-Poland (1992-2004)
EU-Romania (1993-2006)
EU-Slovak Republic (1993-2004)
EU-Slovenia (1997-2004)
EU-South Africa (2000)
EU-Tunisia (1999)
Faroe Islands-Iceland (1994)
Faroe Islands-Norway (1994)

Faroe Islands-Poland (2000-2004)
Faroe Islands-Switzerland (1996)
Georgia-Kazakhstan (2000)
Georgia-Russia (1993)
Georgia-Turkmenistan (2000)
Georgia-Ukraine (1997)
Hungary-Israel (1998-2004)
Hungary-Latvia (2000-2004)
Hungary-Lithuania (2000-2004)
India-Sri Lanka (1999-2005)
India-Singapore (2006)
India-South Korea (2010)
Ireland-Latvia (1995)
Ireland-Lithuania (1995)
Israel-Mexico (2001)
Israel-Poland (1998-2004)
Israel-Romania (2002-2006)
Israel-Slovak Republic (1997-2004)
Israel-Slovenia (1999-2004)
Israel-USA (1986)
Japan-Switzerland (2010)
Jordan-Singapore (2006)
Jordan-USA (2002)
Kazakhstan-Kyrgyz Republic (1996)
Kazakhstan-Russia (1993-2009)
Kyrgyz Republic-Moldova (1997)
Kyrgyz Republic-Russia (1993)
Kyrgyz Republic-Ukraine (1998)
Kyrgyz Republic-Uzbekistan (1999-2007)
Latvia-Slovak Republic (1997-2004)
Lithuania-Poland (1997-2004)
Lithuania-Slovak Republic (1997-2004)
Lithuania-Slovenia (1997-2003)
Macedonia-Moldova (2005-2006)
Macedonia-Romania (2004-2006)
Macedonia-Slovenia (1997-2003)
Macedonia-Ukraine (2002-2005)
MERCOSUR-Bolivia (1996-2004)
MERCOSUR-Chile (1996)
MERCOSUR-Israel (2008)
Mexico-Colombia (1995)
Mexico-Japan (2005)
Mexico-Nicaragua (1999)
Mexico-Uruguay (2005)
Mexico-Venezuela (1995)
Moldova-Ukraine (2005)
Morocco-USA (2006)
New Zealand-Singapore (2001-2009)
New Zealand-Thailand (2006-2009)
Oman-USA (2009)
Pakistan-Sri Lanka (2005)
Panama-Singapore (2007)
Peru-Singapore (2010)
Peru-USA (2009)
Poland-Latvia (1999-2004)
Romania-Moldova (1995-2006)
Russia-Tajikistan (1993)
Russia-Turkmenistan (1993)
Russia-Ukraine (1994)
Russia-Uzbekistan (1993)
SADC-SACU (2009)
Slovak Republic-Estonia (1997)
Slovenia-Israel (1999)
Slovenia-Latvia (1997)
Tajikistan-Ukraine (1995)
Turkmenistan-Ukraine (1995)
TPP-China (2007)
Ukraine-Estonia (1997)
Ukraine-Uzbekistan (1996)
USA-Singapore (2004)

Table 17: Country List

Afghanistan	Djibouti	Kuwait	Qatar
Albania	Dominica	Kyrgyz Republic	Romania
Algeria	Dominican Republic	Laos	Russian Federation
Angola	Ecuador	Latvia	Rwanda
Antigua And Barbuda	Egypt, Arab Rep.	Lebanon	Samoa
Argentina	El Salvador	Lesotho	San Marino
Armenia	Equatorial Guinea	Liberia	Sao Tome and Principe
Australia	Eritrea	Libya	Saudi Arabia
Austria	Estonia	Lithuania	Senegal
Azerbaijan	Ethiopia	Luxembourg	Seychelles
Bahamas	Faeroe Islands	Macao	Singapore
Bahrain	Fiji	Macedonia, FYR	Slovak Republic
Bangladesh	Finland	Madagascar	Slovenia
Barbados	France	Malawi	Solomon Islands
Belarus	Gabon	Malaysia	Somalia
Belgium	Gambia	Maldives	South Africa
Belize	Georgia	Mali	Spain
Benin	Germany	Malta	Sri Lanka
Bermuda	Ghana	Marshall Islands	St. Kitts and Nevis
Bhutan	Greece	Mauritania	St. Lucia
Bolivia	Greenland	Mauritius	St. Vincent and the Grenadines
Bosnia and Herzegovina	Grenada	Mexico	Sudan
Botswana	Guatemala	Micronesia	Suriname
Brazil	Guinea	Moldova	Swaziland
Brunei Darussalam	Guinea-Bissau	Mongolia	Sweden
Bulgaria	Guyana	Morocco	Switzerland
Burkina Faso	Haiti	Mozambique	Syrian Arab Republic
Burundi	Honduras	Myanmar (Burma)	Tajikistan
Cambodia	Hong Kong	Namibia	Tanzania
Cameroon	Hungary	Nepal	Thailand
Canada	Iceland	Netherlands	Togo
Cape Verde	India	New Caledonia	Tonga
Cayman Islands	Indonesia	New Zealand	Trinidad And Tobago
Central African Republic	Iran, Islamic Rep.	Nicaragua	Tunisia
Chad	Iraq	Niger	Turkmenistan
Chile	Ireland	Nigeria	Uganda
China	Israel	Norway	Ukraine
Colombia	Italy	Oman	United Arab Emirates
Comoros	Ivory Coast	Pakistan	United Kingdom
Congo, Dem. Rep.	Jamaica	Panama	United States
Costa Rica	Japan	Papua New Guinea	Uruguay
Croatia	Jordan	Paraguay	Uzbekistan
Cuba	Kazakhstan	Peru	Venezuela
Cyprus	Kenya	Philippines	Vietnam
Czech Republic	Kiribati	Poland	Yemen
Denmark	Korea, Rep.	Portugal	Zambia
Turkey			