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Regional Trade Agreements: What Do We Know and What Do We Miss?

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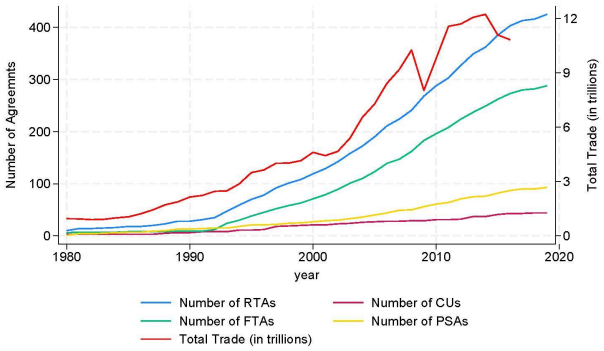
Regional Trade Agreements (RTAs) are a widespread and common tool to facilitate trade of goods and services between countries. While they targeted originally goods trade and mainly tariffs, today, RTAs are much more comprehensive, covering also services and going far beyond eliminating tariffs by harmonizing non-tariff measures and agreeing on policies in a wide area of fields, such as foreign investments, labour markets, protection of intellectual property rights, and the environment. In this policy brief, we first discuss the current state of knowledge concerning the quantification of the effects of RTAs on international trade, and then highlight shortcomings of the standard approach to measure the impact of RTAs opening up potential avenues for future research and policy work in this area.

1. Introduction

At least since World War II, we see an increasing proliferation of Regional Trade Agreements (RTAs). While the General Agreement on Tariffs and Trade (GATT) and its successor, the World Trade Organization (WTO), emphasized multilateral liberalization among all its members and made good progress in its earlier rounds to bring down tariffs among its members, RTAs were always permitted as an exception under Article XXIV of the GATT. Focussing on the period 1980 to 2019, the years covered in the analysis by Larch and Yotov (2024), on which this policy brief is heavily based, Figure 1 shows a sharp increase in the number of RTAs starting around 1980, which is accompanied by a similarly strong increase in total trade flows.[1] The main type of RTAs are Free Trade Agreements (FTAs), which liberalize trade among member countries but leave the trade policy against non-members to be determined independently and unilaterally by each FTA member country. Customs Unions (CUs), such as the European Union (EU) or Mercosur, also coordinate trade policy against non-members, and Partial Scope Agreements (PSAs), that only over certain products, also show an increase but in terms of number play a smaller role.

Figure 1: Evolution of RTAs and manufacturing trade



Source: Own calculations, based on Larch and Yotov (2024) and the RTA data from Egger and Larch (2008) available at https://www.ewf.uni-bayreuth.de/en/research/RTA-data/index.html.

However, the number of RTAs alone does not tell us anything about the economic size and impact of an RTA. A CU, such as the EU, may be far more impactful

[1] The correlation coefficient between the increase in the number of RTAs and the corresponding increase in trade flows is 0.98.

than an average FTA. Moreover, the effects of multilateral RTAs can be very heterogeneous across their members, which may have significant welfare and inequality implications. Finally, especially in recent years, RTAs have become more complex and 'deeper', i.e., expanding their scope and covering more policy areas, such as foreign investment, labor market, protection of intellectual property rights, and the environment, nicely documented in the World Bank Deep Trade Agreement database (Mattoo et al., eds, 2020).

Quantifying the effects of RTAs has been one of the main areas of interest in empirical international trade and has a long history, going back at least to Tinbergen (1962). However, the way this quantification is undertaken changed dramatically over the decades from 1960 to nowadays. In the next section, we will discuss the evolution and state-of-the-art of quantifying RTAs, and we will summarize the main findings and policy implications of the impact of RTAs. Afterward, we will highlight some shortcomings of the existing methods and discuss potential avenues for future research and policy work in this area.

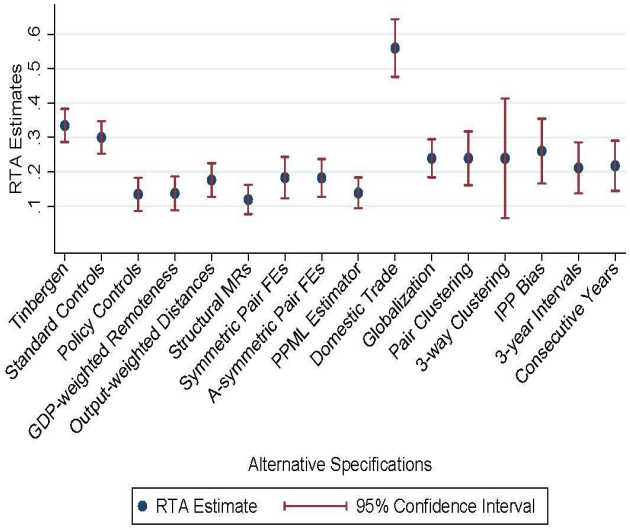
2. Quantifying RTAs: Evolution of the Methods and Findings

The great and continuous interest in the effects of RTAs has been paralleled by several significant methodological developments, which, in turn, have led to improved inference and understanding of the impact of RTAs. To be able to quantify the effect of RTAs on international trade, one needs a specification that is well-suited to explain bilateral trade flows between countries. Tinbergen (1962), relying on the Newtonian gravity equation from physics, provided an empirical specification based on the economic size of countries measured by GDP and proxies for trade costs (such as distance, a dummy variable for neighbouring countries, a dummy variable for Commonwealth preferences, and a dummy variable for Benelux preference). He log-linearized this equation to be able to estimate it with Ordinary Least Squares (OLS) and demonstrated that it leads to a correlation coefficient of actual and predicted trade of around 0.8, implying an R^2 of around 0.7. This high explanatory power was later confirmed by many studies based on the gravity equation, but was surprising, as the specification included a very small number of explanatory variables and lacked a theoretical foundation.[2] Still, already Tinbergen (1962) included dummies for the Commonwealth and Benelux, and many others used it to quantify RTAs.

Figure 2 shows a point estimate of the effects of RTAs that is a bit larger than 0.33 for a specification based on Tinbergen (1962) using alongside the RTA dummy only exporter and importer GDP and distance as explanatory variables and the aggregate manufacturing dataset from Larch et al. (2019). This estimate implies that, all else equal, an RTA between two countries leads to an increase in bilateral trade of about 40%.[3]

Note that the positive RTA effects from Tinbergen's and many subsequent applicactions apply to both, exports and imports. Hence, a positive average RTA effect benefits the producers in the member countries, who enjoy more favorable export conditions, and also the consumers in the member states who enjoy lower prices and wider variety of goods. Due to strong input-output linkages and the huge role of multinational firms in international trade, cheaper inputs due to international trade as well as opening markets for own products for exports are both leading to increased trade.

Figure 2: Evolution of RTA estimates



Note: This figure plots estimates of the effects of RTAs, along with the corresponding confidence interval, which follows the evolution of the methods for estimating the RTA effects. The X-axis of the figure lists the alternative specifications.

Source: Larch and Yotov (2024), Figure 2.

Enriching Tinbergen's econometric model by adding time-invariant control variables for the presence of colonial ties, contiguous borders, and common official language (labeled as "Standard Controls" in Figure 2) decreases the point estimate for RTA only a bit, while adding an indicator variable for membership in the

[2] Neither the Ricardian theory of trade based on comparative advantages due to technological differences nor the Heckscher-Ohlin-model of trade based on comparative advantages due to factor endowment differences, are compatible with the gravity equation.

[3] This is calculated as (exp(0.334)-1)*100.

GATT and WTO (labeled as "Policy Controls" in Figure 2) shrinks the estimate to about 0.13, implying that an RTA between two countries leads to an increase in bilateral trade of about 14%. This drop highlights that the RTA variable from the naïve gravity model without additional policy controls has captured effects that should be attributed to the GATT/WTO membership and implies that the omission of other trade liberalization (or protection) policy variables may lead to significant biases in the estimates of the RTA effects. At the same time, the positive and significant RTA estimate in this specification suggests that RTAs have stimulated trade further, in addition to the impact of the GATT/WTO.

The remarkable success of the gravity equation led to a widespread application for policy analysis. However, only in the late 70s and early 80s, Anderson (1979) and Bergstrand (1985) provided theoretical foundations for a structural gravity model of trade. Those models are based on the idea that products are differentiated by place of origin and consumers have a love of variety, leading to trade among countries. These theoretical frameworks explain intra-industry and trade between similar countries in terms of technology and factor endowments well and therefore align with the empirical facts. Importantly, the theoretical foundations of the gravity equation revealed that the specification based on Tinbergen (1962) omitted some important determinants of bilateral trade flows. Specifically, it did not account for the effects of prices and for the fact that how much two countries trade with each other depends not only on their sizes and the direct bilateral trade costs between them but also on how integrated or remote they are from the rest of the world. While proven to be very important for estimating the effects of certain determinants of trade flows, controlling for these price and network effects (see "GDP-weighted Remoteness" and "Output-weighted Distances" in Figure 2), including state-of-the-art methods with exporter-time and importer-time fixed effects (labeled "Structural MRs" in Figure 2) does not lead to significant changes in the estimates of the RTAs, which remain relatively small.

Besides the good performance of the gravity equation in terms of overall explanatory power, the proxies for the trade costs are still ad-hoc, or, as Chaney (2018) put it: "…[w]hile the role of size is well understood, that of distance remains mysterious." Furthermore, the estimate of the effects of trade policy variables, such as RTAs or GATT/WTO, may be potentially biased due to reverse causality and/or omitted factors that simultaneously affect trade and the probability of signing an RTA or becoming a member of GATT/WTO (Baier and Bergstrand, 2007). Symmetric or asymmetric pair fixed effects can help with both problems by controlling for any non-time varying bilateral effects. However, as demonstrated by specifications labeled "Symmetric Pair FEs" and "Asymmetric Pair FEs" in Figure 2, estimates for the RTA effect are remarkably stable while fully controlling for all possible (observable and unobservable) time-invariant bilateral trade costs.

While Tinbergen (1962) estimated the log-linear version of the gravity equation, already Pöyhönen (1963, 1964) recognized that the gravity equation can be estimated in its multiplicative form.[4] More recently, the influential work of Santos Silva and Tenreyro (2006) led to the establishment of Poisson Pseudo Maximum Likelihood (PPML) as the leading gravity estimator. Larch, Shikher, and Yotov (2024) summarize seven advantages of using PPML: i) PPML estimates are consistent in the presence of heteroskedasticity, ii) it utilizes information contained in zero trade flows, iii) the implementation and estimation of PPML is easily performed in many software packages, iv) as it is a pseudo maximum likelihood estimator it does not depend on a specific distribution form of the error term, v) does not suffer from an incidental parameter problem even with exporter-time, importer-time, and bilateral fixed effects, vi) it satisfies the constant variance to mean ratio in the data in many cases, and vii) it is consistent with the underlying theories leading to a gravity equation. As seen in Figure 2, estimating the gravity model in its multiplicative form using the PPML estimator instead of in its log-linear form using OLS leads to a slightly smaller RTA effect.

The most important ingredient for trade gravity estimation is good data on trade flows used as the dependent variable. Bilateral, nominal trade flows in common currency measured at delivered prices for many countries and years and as disaggregated as possible should be used. Furthermore, data on domestic sales should be included, which is consistent with theory and allows for (better) identification of various trade cost components (see for a more detailed discussion and references on the importance of using domestic trade flows Yotov, 2022, and Larch, Shikher, and Yotov, 2024). Specification "Domestic Trade" from Figure 2 shows that the inclusion of domestic sales leads to a huge increase in the estimate of the effects of the RTAs. The increase in the RTA estimate is explained by the fact that RTAs are diverting trade from domestic sales to international trade and points to this mechanism (e.g., as opposed to diversion of trade from third countries) as potentially the most important channel for increasing trade among RTA members.

[4] The Poisson model was also used in the spatial interactions literature to estimate the gravity model (Flowerdew, 1982; Flowerdew and Aitkin, 1982; Fotheringham and Williams, 1983).

However, as pointed out by Bergstrand, Larch, and Yotov (2015), when including domestic sales, overall differences between domestic sales and international trade should be captured by time-varying border effects capturing common globalization effects. The results labeled "Globalization" in Figure 2 show that this decreases the magnitude compared to the estimates with domestic sales but not controlling for globalization effects but still leads to a bigger RTA effect than without domestic sales, implying that an RTA between two countries leads to an increase in bilateral trade of about 27% (as compared to the otherwise identical specification of "PPML estimator" leading to an RTA effect of about 15%).

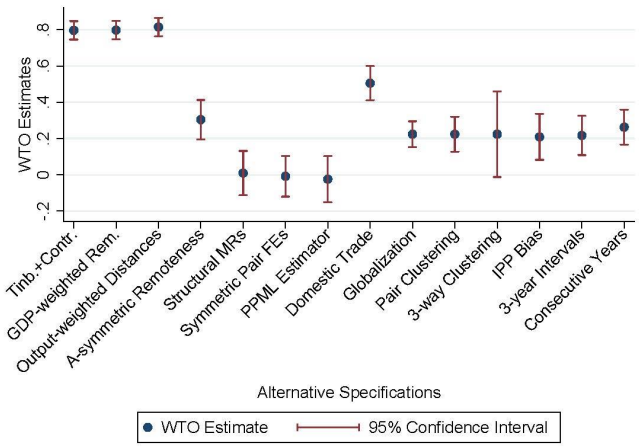
Two remaining considerations for estimating the effects of RTAs are: i) the correlations in the error term, and ii) the choice of the interval of data. Due to the trade data structure consisting of exporters, importers, and years (and with industry/sector data, even industries/sectors), errors may be correlated across several dimensions. While there is no analytical solution to the challenge of proper clustering, different ways of clustering have been suggested in the existing literature, leading to an adjustment of the standard errors. Clustering by country pair has been the standard practice in the literature, but 3-way clustering by exporter, importer, and year has also been implemented as a more conservative alternative. The results from specifications "Pair Clustering" and "3-way Clustering" reveal that while the standard errors are larger, the estimates of the effects of the RTAs remain statistically significant.

In a gravity model with exporter-time, importer-time, and year fixed effects estimated with PPML, PPML leads to consistent estimates but with an asymptotic bias. Weidner and Zylkin (2021) suggest a bias correction. Our experience shows that in large enough samples, which is the standard case with bilateral trade data, the bias correction does not substantially alter results. Consistent with this, the results from the specification labeled "IPP Bias" in Figure 2 reveal that the effects of RTAs remain very similar.

Motivated by criticisms of gravity models with fixed effects (e.g., Cheng and Wall, 2005), many prominent papers that estimate the RTA effects (e.g., Baier and Bergstrand, 2007) use interval data to estimate the effects of RTAs. More recently however, Egger, Larch, and Yotov (2022) demonstrate that, to avoid randomly dropping data and to allow for better capturing of the evolution of RTA effects over time, gravity estimations with 3-way fixed effects should rely on data for consecutive years. The estimates so far in Figure 2 are based on 5-year intervals. We also show results of 3-year intervals and using all years in Figure 2. In line with the recommendation of Egger, Larch, and Yotov (2022), this hardly affects results.

Figure 2 presents the results for the RTA estimates, and we saw that since Tinbergen (1962) a lot of developments have been made for the estimation of trade policy effects. Considering all these developments, the estimate in the given sample for the effect of RTAs on bilateral trade is an increase of 27%. Many of the new developments did not seem to change the estimates a lot. However, this may be different when using other data or for other policy variables. We show in Figure 3 the estimates for GATT/WTO that we also included in our specifications and highlighted to be an important control variable to capture overall multilateral liberalization efforts otherwise potentially attributed to single agreements. As can be seen, controlling for price and network effects as well as the inclusion of domestic sales substantially change the GATT/WTO estimates. Overall, considering all the recommendations, we end up with an estimate of about 0.22, implying an increase in bilateral trade of about 25% for two GATT/WTO member countries relative to trade between non-member countries or between one member and one non-member country. To sum up, we see that methods matter.

Figure 3: Evolution of GATT/WTO estimates



Note: This figure plots estimates of the effects of GATT/WTO, along with the corresponding confidence interval. The X-axis of the figure lists the alternative specifications.

Source: Larch and Yotov (2024), Figure 3.

3. Potential Avenues for Future Research and Policy Implications

While the developments over the last decades helped to improve our understanding and estimates of RTAs, several challenges and potential avenues for future research remain, which we will discuss in turn and in light of their policy implications. Specifically, we will discuss i) the trade cost specification, ii) the static

nature of the gravity equation, and iii) the potential heterogeneity of the RTA effects.

3.1 Trade Cost Specification

First, and as highlighted in Section 2, the trade cost specification is still ad hoc and potentially misses important components. One challenge is the quantification of non-discriminatory trade effects and country-specific effects. In a properly specified gravity model, those effects are not identifiable due to the included fixed effects. Several recent contributions utilize the inclusion of domestic sales for estimating the differential effect of non-discriminatory policies on international trade relative to domestic sales (see, Heid, Larch, and Yotov, 2021; Beverelli, Keck, Larch, and Yotov, 2023). Recently, Freeman, Larch, Theodorakopoulos, and Yotov (2021) suggested a two-stage approach to obtain the total and not only the differential effect. Further investigation and improvements on this front will be very fruitful.

Furthermore, as RTAs are becoming more complex, additional dimensions may be distinguished. RTAs contain many provisions, and distinguishing the effects of different provisions in RTAs is fruitful and yet underexplored, besides some recent contributions such as Breinlich, Corradi, Rocha, Ruta, Santos Silva, and Zylkin (2021), Hoekman, Santi, and Shingal (2023), and Gordeev and Steinbach (2024). Getting more insights will help predict future RTA effects by comparing RTA predictions on previous, similar RTAs, and not only on the average effect.

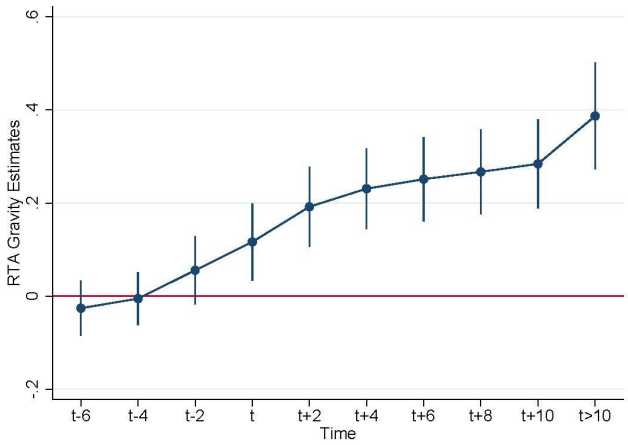
Potentially, there are also direct trade cost reduction effects from the conclusion of RTAs of other countries, e.g., when an RTA leads to meeting certain quality standards, which would enable and/or stimulate exports to non-member states. While this is explored for the formation of RTAs (see, Egger and Larch, 2008; Chen and Joshi, 2010; Baldwin and Jaimovich, 2012), it is not deeply investigated for trade flows. Some attempts in this direction are Dai, Yotov, and Zylkin (2014), Sopranzetti (2017), and Baniya, Rocha, and Ruta (2020), but we see the potential to take into account the network structure more explicitly.

3.2 Dynamic Effects

Another shortcoming is the static nature of the gravity equation. Both, the theoretical frameworks leading to a gravity equation and the trade cost specification typically do not consider dynamic effects. In terms of theoretical frameworks, recent contributions, such as Eaton, Kortum, Neiman, and Romalis (2016), Caliendo, Dvorkin, and Parro (2019) or Anderson, Larch, Yotov (2020) highlight that adding country-specific, dynamic decisions, such as capital accumulation or changes in productivity due to research and development, still lead to the same gravity equation and do not change any of the estimation recommendations.

More recent attempts, such as Anderson and Yotov (2020), Egger, Foellmi, Schetter, and Torun (2023), or Larch, Navarro, and Novy (2024), try to bring in some bilateral, dynamic components that also change the underlying gravity equation, and we await a consensus and further improvements in this direction.

Figure 4: The effects of RTAs over time



Note: This figure plots the estimates of the RTA effects over time by adding all the leads, lags, and contemporaneous RTA estimates.

Source: Larch and Yotov (2024), Figure 4a.

Another attempt is to add lagged RTA effects to account for the sluggish adjustment of trade flows to trade policy changes, see Baier and Bergstrand (2007) and Egger, Larch, and Yotov (2022). The latter distinguish three phases of the effects of RTA estimates visualized in Figure 4. First, the "Pre-RTA and anticipation phase", which shows slight positive effects before entry into force in anticipation of the agreement. Typically RTAs are assumed to take effect when they enter into force. However, negotiations often take several years and firms may already adjust before the RTA is legally in force. Additionally, as nicely summarized by Cernat (2024), expectations may also drive positive or negative effects not necessarily substantiated in the actual agreement. The second phase is the "Growth phase", which is the phase of the first years after entry into force. Effects are positive but small and only slowly grow. In the last phase, the "Maturity phase", the RTA reaches its full potential and we see positive, significant effects, which start after around 10 years, i.e., it takes around 10 to 15 years

(including the anticipation) to unfold the full potential of an implemented RTA.[5]

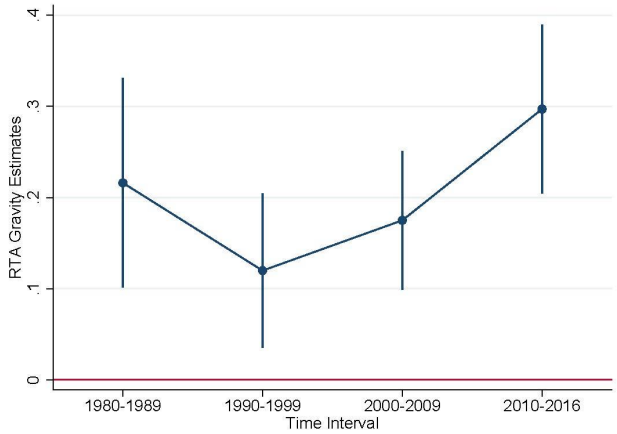
Note that the inclusion of leads and lags is not well theory-founded and proper identification is challenging given the current data. We await better theoretical foundations and the use of more and better data to improve our understanding of the dynamics and adjustments of RTAs.

From a policy perspective, it is important to keep in mind that it takes time until the full potential of an RTA is reached and that not accounting for positive anticipation effects may lead to an underestimation of the effects of RTAs.

3.3 Heterogeneity of the RTA Effects

While many studies focus on the average effect of RTAs, better and more detailed data and some recent results show that RTA effects are potentially very heterogeneous. We see heterogeneity in various dimensions: i) over time, ii) by types of RTAs, iii) by agreements, iv) by pairs and/or direction, and v) across sectors.

Figure 5: RTA estimates for different decades



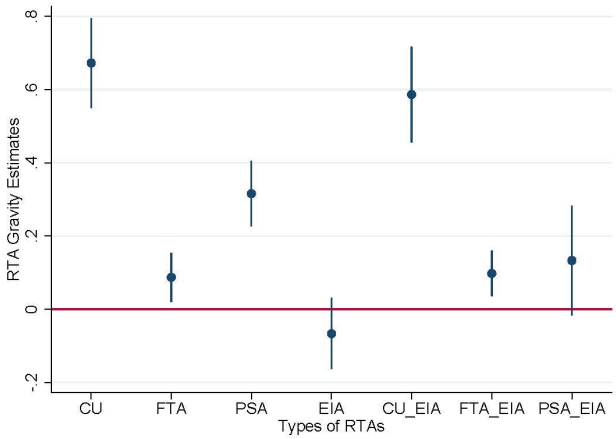
Note: This figure plots estimates of the effects of RTAs, along with the corresponding confidence interval, for different decades. The X-axis of the figure gives the time intervals.

Source: Larch and Yotov (2024), Figure 4b.

Heterogeneity over time can be related to sluggish adjustments, as discussed before, or because of effects changing over, for example, decades. In Figure 5 we show estimates for four decades. We see a stronger effect for the periods 1980–1989 compared to 1990–1999, which may be explained by natural trading partners concluding RTAs earlier (see Baier and Bergstrand, 2004). While the number of RTAs substantially increased in the period 1990-1999 (see Figure 1), sometimes called the "golden age", the average effect seems to be smaller. In later periods, the estimated effects increase. This may be driven by more recent agreements being deeper and maybe more efficient. Going deeper into different periods and the effects over time of trade agreements seems important, and collecting data spanning a longer time horizon will help to gain further insights into the evolution of RTAs. The results are also a warning that the starting point of the dataset could influence the outcome of the RTA estimates.

Figure 1 shows various types of RTAs, such as FTAs, CUs, and PSA. As CUs are the most ambitious agreement type, we expect the largest effects. Indeed, Larch and Yotov (2024) find an estimate of over 0.67, implying an increase of bilateral trade flows of 95% (see Figure 6). Interestingly, economic integration agreements (EIAs), which cover services trade, turn out to be non-significant for manufacturing trade.

Figure 6: RTA estimates by type



Note: This figure plots estimates of the effects of RTAs by type.

Source: Larch and Yotov (2024), Figure 5a.

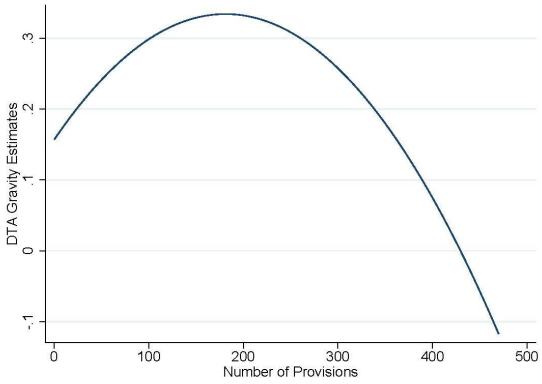
Overall, deeper agreements are found to have stronger effects. However, when allowing for non-linear effects of the number of provisions Larch and Yotov (2024) find a turning point from which provision decrease the positive effect of an RTA and eventually even turns it negative (see Figure 7). Hence, very complex agreements with many provisions may even turn protectionist.

Given these first results, exploring the depth and number of provisions in more detail to understand what

[5] Breuss (2014) also emphasizes that effects of RTAs, such as the Transatlantic Trade and Investment Partnership (TTIP) negotiated back then, potentially take considerable time to become fully effective.

is driving the different effects of different types of RTAs and going deeper into the role of RTAs in services trade seem fruitful areas for future research. Specifically, for services trade tariffs do not apply, but many other regulations present in deep RTAs are important. Also, the role of RTAs for digital trade, given the recent extension of the WTO moratorium on e-commerce tariffs and the accompanying discussion of ending the moratorium, is worth having a closer look at.[6] Furthermore, recently heavy interest in the effects of geopolitical motives and differences on trade evolved, with the first results hinting at a potential for deep RTAs to compensate for at least some of the geopolitical differences.[7]

Figure 7: RTA estimates by number of provisions



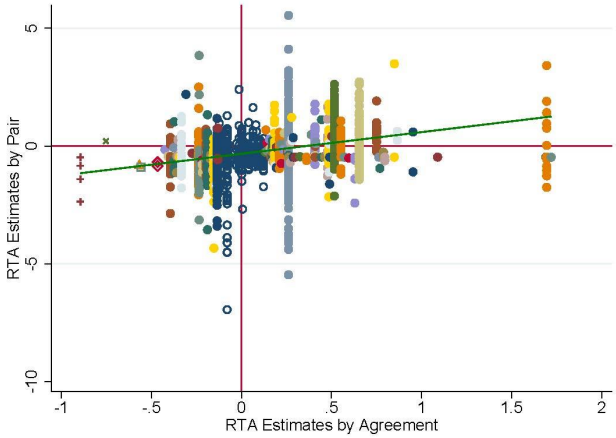
Note: This figure plots estimates of the effects of RTAs depending on the number of provisions.

Source: Larch and Yotov (2024), Figure 5c.

Given more detailed and longer data, some papers started looking at the effects per agreement (Baier, Yotov, and Zylkin, 2019). There is huge heterogeneity, and this heterogeneity is not only by agreement but also between pairs of countries within an agreement. Figure 8 plots the RTA estimates by pair of countries against the RTA estimates by agreements. As can be seen, the heterogeneity within agreements (indicated by the same color) ranges from about −5 to 5, while the estimates across the visualized agreements range from −1 to 2. This huge heterogeneity within an agreement reminds us that behind an average, positive RTA effect huge heterogeneity could be hidden. Some member countries of an RTA may see substantially lower or even negative trade effects than other member countries. This highlights the importance of being careful not to overlook the potential distributional effects of bigger RTAs, not only between different agents in an economy, but also between countries within larger liberalization blocs, such as the EU, MERCOSUR, USMCA, or GATT/WTO.

To give some concrete examples based on Figure 8, we see for example the largest negative estimate of −0.90 for the EFTA-Central America (Costa Rica and Panama) agreement (red pluses on the far left), while the large positive effects for many members of 1.69 is for the Protocol on Trade Negotiations (orange dots on the far right). For the latter, we see substantial variation across pairs, with exports from Oman to the United Arab Emirates affected most negatively, while exports from Bahrain to Qatar are predicted to increase the most. The largest variation within an agreement is obtained for the Global System of Trade Preferences among Developing Countries (GSTP), with an average estimate of 0.26 (visualized by grey dots in Figure 8), and the lowest estimate obtained for exports from Algeria to Vietnam and the largest for exports from Egypt to Trinidad and Tobago.[8]

Figure 8: RTA estimates by pair and by agreement



Note: This figure plots estimates of the effects of RTAs by pair against estimates of the effects of RTAS by agreement.

Source: Larch and Yotov (2024), Figure 7b.

Heterogeneity may also arise across sectors. As mentioned before, manufacturing and services trade may be affected differently by an RTA. Furthermore, substantial trade barriers still exist in agriculture. Figure 9 plots the estimates for individual industries of ITPD-E-R02.[9] As can be seen, estimates range from -0.23 to

[6] See https://www.whitecase.com/insight-alert/wto-extends-e-commerce-tariff-moratorium-broader-negotiations-continue, and https://cepr.org/voxeu/columns/why-wto-moratorium-digital-tariffs-should-be-extended.

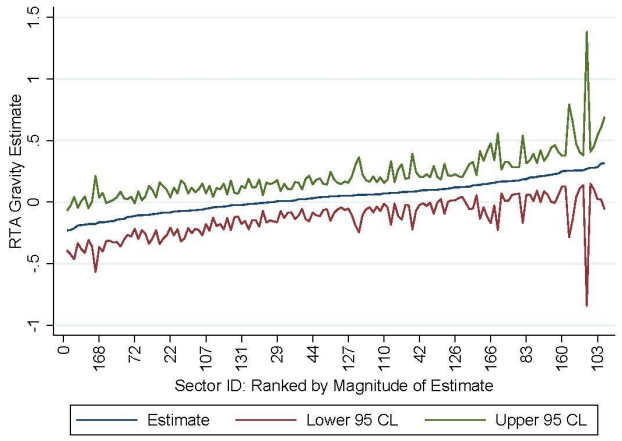
[7] See Dreyer (2024) and the program of the geoeconomics conference jointly organized by the Kiel Institute and CEPR in Berlin (https://www.ifw-kiel.de/institute/events/conferences/geoeconomics-2023/).

[8] Due to space constraints, we do not go deeper into the discussion of distributional effects of trade liberalization for different agents, such as consumers, importers, and exporters. See for a recent contribution Galle, Rodriguez-Clare, and Yi (2022).

[9] ITPD-E-R02 is freely available for download at https://www.usitc.gov/data/gravity/itpde.htm.

around 0.32. While this provides evidence for the huge heterogeneity, the reasons are not yet explored. Going deeper into the RTAs and what types of trade are liberalized or not may shed some light on the heterogeneity across the sectors.

Figure 9: RTA estimates for different industries



Note: This figure plots the estimates (and their corresponding confidence intervals) for the individual industries from the ITPD-E-R02.

Source: Larch and Yotov (2024), Figure 9b.

4. Conclusions

RTAs have enjoyed significant attention from academic trade economists and policy makers alike. Estimates of the effects of RTAs vary widely, but the overwhelming evidence of the literature is that they do have positive effects on average. RTAs back in the 90s had smaller effects than more recent agreements, which are typically deeper and cover more policy areas. Hence, the effects of RTAs is more than tariffs and the effects of RTAs and tariffs should therefore be studied jointly.

The effects of RTAs are very heterogeneous across various dimensions, including over time, by type of agreement, by depth of agreement, by agreement, by pair within agreement, by direction of trade flows, and by sectors. However, deeper agreements are not necessarily better. Concerning the depth, we note that at some point very complex and deep RTAs may to a certain degree turn protectionist. This may be important in the process of concluding new agreements, as it potentially gives more power to developed, large countries trying to cover many policy areas. It also reinforces the need for taking into account the heterogeneity of RTAs in the evaluation.

While many developments at least since Tinbergen (1962) in terms of methods and data improved our understanding and the estimates of the effects of RTAs, we also see many fruitful areas for future research. For example, improving the trade cost specification further, taking into account the network structure more explicitly, improving our understanding of the dynamic adjustments, and going deeper to understand the various dimensions of heterogeneity. All of these improvements will help to get a better understanding of the effects of RTAs and more reliable estimates for the evaluation of potential future agreements.

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