KOMMERSKOLLEGIUM
NATIONAL BOARD OF TRADE SWEDEN

The trade effects of EU regional trade agreements — evidence and strategic choices

2019

Foreword

Trade policy analysis increasingly relies on empirical examination. Improved methods and data availability allow us to make ever more accurate evaluations of trade policy. In our 2018 publication, *Economic Integration Works*, the National Board of Trade surveyed recent empirical literature on the trade effects of regional trade agreements (RTAs). In this new publication, we make our own gravity estimations of EU RTAs—overall, by category, and for individual agreements. Because our analysis includes estimations of the trade effects of EU and GATT/WTO membership, this permits us to discuss different trade policy strategies. For instance, our estimations consistently indicate strong trade effects of GATT/WTO membership, a result that is relevant in current discussions of WTO reform.

However, the long-term objective of this project goes beyond the assessment of EU RTAs and trade policy strategies. It is to create an infrastructure for further empirical analysis. In this report we have treated EU RTAs as a "black box". While we can now be quite certain that EU RTAs have a positive impact on trade and that the effect increases with the level of ambition, we still do not know which provisions in those agreements stimulate trade. Another blind spot in the analysis is the effect of EU RTAs on trade in services. In the future, we will be able to open up the black box and analyse trade effects by provision and for services, as well as the effects of non-tariff barriers.

During the course of this project, we have made gravity estimations for almost all RTAs in the WTO's RTA database. In other words, there are many interesting results that we do not publish. Please do not hesitate to contact us for further information on individual RTAs or trade effects of the EU or the WTO for individual members.

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Summary

Since negotiations to conclude the World Trade Organisation's (WTO) Doha Development Agenda stalled in 2008, the main efforts by the EU to liberalise trade have been undertaken in the context of regional trade agreements (RTAs). As a result, there has been growing interest in how effective they are in terms of stimulating trade. Another motivation for this report comes from the observation that almost all positive welfare effects related to trade agreements require more economic integration and international division of labour, i.e. trade. With these considerations in mind, the purpose of this work is to analyse the effects of EU RTAs on trade in goods.

Results

According to our main estimate, EU RTAs increase trade between the EU and its partners by 48 percent on average. With trade-weighted estimations, the effect increases from 48 to 56 percent.

Our analysis reveals substantial phase-in effects from EU RTAs. After ten years of operation, the estimated trade effect is 65 percent. We find no evidence of anticipation effects of EU RTAs, i.e. effects that can be observed before an agreement enters into force.

The trade effect of EU RTAs increases with the level of ambition in the agreement. EU custom unions (with Turkey, San Marino, and Andorra) and single-market integration agreements (EEA, EU—Switzerland) increase trade by 111 percent on average. By contrast, no impact was found for economic partnership agreements with countries in Africa, the Pacific, and the Caribbean. Earlier (1996—2010) EU free trade agreements (FTAs) increase trade by 20 percent on average, whereas post-2010 EU FTAs increase trade by 37 percent.

Among post-2010 EU FTAs we find positive trade effects for the EU—Ukraine DCFTA (65 percent), CETA (42 percent), EU—ANDEAN (37 percent), and the EU—Korea FTA (36 percent). The 2000 EU—Mexico Global Agreement has had no statistically significant effect on trade, however. The current update of the EU agreement with Mexico therefore appears to be prudent trade policy.

While we find moderate to strong trade effects from EU RTAs, the effect associated with EU membership is far stronger. In our main regression, the effect of EU membership is four times larger than the impact from post-2010 EU FTAs, i.e. CETA-style FTAs.

A result that stands out is the trade impact of WTO membership. The average effect of GATT/WTO membership is 50 percent larger than the average effect of all RTAs globally. Breaking down the GATT/WTO effect further suggests that large members such as the US, China, and India have all benefitted more than the average member country from GATT/WTO membership.

Trade policy conclusions

The trade impact of EU RTAs increases with the level of ambition. In order to justify the considerable time, effort, and public resources put into the negotiation of EU RTAs, the agreements should therefore have a high level of ambition.

The analysis is also relevant for countries that face an EU integration choice. Currently, a discussion regarding the level of EU integration is taking place in the UK and Switzerland as well as between the EU and candidate countries such as Serbia, Albania, North Macedonia, and Montenegro. According to our results, EU membership is superior to both Norway-style (EEA) and CETA-style agreements in promoting trade. Ultimately, welfare gains from economic integration depend on trade effects, and this report suggests that EU integration has been highly successful in stimulating trade.

Finally, it is not in the interest of WTO members to reduce their commitment to the multilateral trading system. On average, the WTO has had stronger trade effects than RTAs, particularly for large and influential members such as the US, China, and India. If we add to this the observation that the WTO affects all combinations of bilateral flows of its 164 members simultaneously, while RTAs affect only bilateral or regional trade flows one by one, the overall performance of the WTO is clearly superior to a purely bilateral trade strategy.

Content

1 Introduction and purpose

Since negotiations to conclude the World Trade Organisation's Doha Development Agenda stalled in 2008, the main efforts by the EU to liberalise trade have been undertaken in the context of regional trade agreements (RTAs), primarily agreements referred to as free trade agreements (FTAs).[1] As a result, there has been a growing interest in how effective these agreements are in terms of stimulating trade. Last year, therefore, the National Board of Trade published a review of the academic literature from 2007 and onwards on the trade effects of RTAs generally: Economic Integration Works (Kommerskollegium, 2018).

Another motivation for this new report comes from the observation that almost all positive welfare effects related to trade agreements require more economic integration and international division of labour, i.e. trade. With these broad considerations in mind, the purpose of this report is to analyse empirically the effects of EU RTAs on trade in goods.

1.1 The trade effects of EU RTAs

While EU RTAs make up a large share of all RTAs worldwide (14 percent of RTAs notified to the WTO in May 2019 had the EU as one part), little is known about the trade effects of EU RTAs. In the European Commission's impact assessments, empirical analysis of the trade effects of RTAs has typically not been used.[2] Historically, the objective of EU impact assessments has been to estimate the effect of *future* rather than *current* agreements. Therefore, the Commission has

primarily relied on forecasting instruments such as computable general equilibrium models.

In academic publications, on the other hand, where empirical analyses of RTAs are common, the typical objective is to identify the appropriate method for disentangling the trade effects of RTAs from other factors that influence trade (Baier and Bergstrand, 2007; Santos Silva and Teneyro, 2006; Yotov et al., 2016). Consequently, we still know little about the trade effects of EU RTAs specifically. Considering the value embedded in EU trade, it is thus relevant, both from a research and a policy perspective, to take a closer look at the trade impact of EU RTAs.

1.2 Scope

As part of our broader objective, we analyse both the average trade effect of all EU RTAs and the effect of individual agreements. A key issue that we address is whether the impact differs depending on the level of ambition of the agreement. Finally, to broaden the picture we compare the trade impact of EU- and GATT/WTO membership with that of RTAs.

In the study, we analyse only trade in goods. In the future, we hope to return to the issue of the effect of EU RTAs on trade in services, the effect of individual RTA provisions, and the effect of non-tariff barriers.

1.3 Structure

The report is organised as follows. First, we survey the relevant academic literature. Section 3 presents the workhorse of empirical research on the trade effects of RTAs—the gravity model of international trade. Section 4 describes the data, including information on RTAs and RTA categorisation, while Section 5 gives an overview of current trends in EU trade with key RTA partners. Section 6 then introduces the gravity analysis by presenting estimates of trade effects for EU integration. Because gravity estimations for the EU itself are well covered in the literature, this allows us to benchmark results obtained from our preferred version of the gravity model. In Section 7, we present our main results regarding the trade effects of EU RTAs by category as well as individually, and Section 8 compares these results to the trade effects of the WTO. Finally, Section 9 summarizes results and draws conclusions.

1.4 From trade to welfare effects

Because a main purpose of trade agreements is to facilitate trade, empirical estimation of their trade effect is an obvious focus in determining the effectiveness of RTAs. In fact, while RTAs often have additional objectives, it is hard to see their raison d'ètre unless they stimulate trade.

Ultimately, however, we are interested in how RTAs affect people's living standards *via* their impact on trade. There are a number of channels through which increased trade benefits society: better resource allocation, higher wages and better working conditions, a greater variety of and lower prices for goods and services, technological diffusion, increased competition, productivity gains, economic development for poor countries etc. Because almost all positive welfare effects related to trade agreements require deeper economic integration and more international division of labour (i.e. trade), it is important to examine the effectiveness of trade agreements in this regard.[3]

However, trade can also exacerbate structural adjustment costs and have negative external effects, for instance by adding to environmental problems. Trade and trade liberalisation can also affect men and women differently, especially in the labour market. Thus, carefully designed domestic policies that facilitate labour market adjustments, invest in education, promote gender equality, strengthen competition and address negative external effects are required to fully capture the gains from trade and mitigate adjustment costs. With these considerations in mind, the report is based on the basic view that increased trade is an effective way to help us achieve wider societal objectives.

2 Literature

As pointed out in Kommerskollegium (2018), earlier studies displayed mixed results on the trade effects of RTAs, whereas studies published after 2007 tend to generate more consistent results, at least at the aggregate level. Consequently, we continue our practice of including only studies published 2007 and onwards when surveying the literature.

Few post-2007 studies have examined the trade effects of EU RTAs as a group. Instead, a typical focus has been the effect of the EU itself or its rounds of enlargement. The main exception here is Soete and Van Hove (2017). In their baseline gravity model they use an ordinary least squares (OLS) estimator to analyse the trade effects of EU RTAs in force between 1988 and 2013. According to Soete and Van Hove, the average effect of EU FTAs is to increase trade between the parties by 42 percent after ten years. For EU preferential trade agreements (both reciprocal and non-reciprocal), trade increased by 21 percent, whereas the EU's three external customs unions (with Turkey, Andorra, and San Marino) increased trade by 77 percent. Interestingly, Soete and Van Hove find that the observed effects are explained almost entirely by an increase along the extensive margin, i.e. by an increase in "new" trade, rather than an increase in existing trade between the EU and its partners (the intensive margin).

Soete and Van Hove conclude that:

The size of the effect depends on the degree of integration implied by the agreement. FTAs and CUs clearly generate stronger cumulative trade effects than PTAs. Hence, effective trade integration requires deep integration.

Other post-2007 studies focus on *individual* EU trade agreements. Lakatos and Nilsson (2017), for instance, evaluate the EU-Korea FTA from 2011, using a binary logit estimator for the extensive margin and a Poisson estimator for the intensive margin. Using trade data between 2005 and 2014, they conclude that the EU-Korea FTA has had a positive and statistically significant impact on EU exports to Korea along both the intensive and the extensive margins. Importantly, they find that the agreement had a substantial anticipatory effect. Lakatos and Nilsson conclude:

These results have implications for how the profession should think about how to quantify the gains from FTAs (in trade terms). For example, if a large share of the trade gains already materializes before the entry into force of an FTA, comparing the impact of the FTA with a reference period of years just before its entry into force may be underestimating the full effects of the agreement. In this particular case, if we do just that, we reduce the impact on EU exports...to less than one-third of the size.

As part of its evaluation of the EU-Korea FTA, the European Commission (2018a) also made gravity estimations of the trade effects of the agreement. For that purpose, the Commission used data from the World Input-Output Database on trade flows between 2000 and 2014 for 42 countries. According to its calculations, the agreement has

increased EU exports to Korea by 54 percent on average and Korean exports to the EU by 15 percent.[4]

Finally, Persson and Wilhelmsson (2006) focus on the impact of EU trade preferences for developing countries. Using trade data from 1960-2002 and an OLS gravity model with country-pair and time fixed effects, they find a positive impact from EU preferences on the exports of developing countries to the EU. The impact was particularly strong for countries that benefit from a combination of Generalized System of Preferences (GSP) and Cotonou preferences.

Overall, the conclusion from this survey is that studies that focus on the aggregate effect of EU RTAs are rare and that there is a need for more systematic analysis using state-of-the-art econometric tools.

3

Methodology:
The gravity model

The gravity model of trade dates back at least to Tinbergen (1962), who proposed that the size of bilateral trade flows between any two countries can be approximated by employing the "gravity equation", which is derived from Newton's theory of gravity. Since then, the model has been developed in several ways and is now well established (Bergstrand, 1990; Yotov et al., 2016; Ayman and Nechi, 2019).

3.1 Gravity and RTAs

One reason for the success of the gravity model is that it allows for analysis of the impact of trade agreements. Early versions of the gravity model used control variables such as distance, GDP, common border or language to isolate the effect of an RTA on trade flows. Recent developments have departed from this approach. Among the updated versions of the model, the dummy variable approach (used in this paper) is the most common. The idea behind this method is to utilize a large set of dummy variables (taking either the value zero or one) to isolate the effect of RTAs on trade flows.

In recent years, two sets of fixed effects have typically been used in the dummy variable version of the model. The first set consists of country- and year-specific dummy variables. These fixed effects capture country- and year-specific characteristics such as GDP, economic growth, and institutional quality. The second set of dummy variables is country-pair fixed effects. The country-pair fixed effects capture time-invariant country-pair relations (such as

common border, distance, and historical ties). Hence, the only variation not controlled for in the model is country-pair effects that vary over time, such as the introduction of an RTA.

With this set-up, we have come a long way towards finding a specification that allows us to isolate the impact of an RTA on trade. Needless to say, though, researchers still discuss a wide set of estimation and model development issues.[5]

3.2 From old to new gold standard

A few years after the millennium, the gravity model took a big leap forward. Works by Anderson and van Wincoop (2003), Eaton and Kortum (2002), Egger and Pfaffermayr (2003) and, Feenstra (2002) are all part of a stream of papers suggesting a more stringent estimation strategy. With the risk of over-simplifying, we choose to label the outcome from this generation of models as "the old gold standard". The old gold standard model used the traditional OLS regression estimator with the two sets of fixed effects mentioned above. Gravity analysis using this set-up became widespread around 2003–2007.[6] During the past decade, however, the gravity model has undergone further development.

Around 2006, two new elements were added to the gravity model. First, Santos Silva and Tenreyro (2006, 2011) proposed an estimator that had the advantage of overcoming problems associated with zero trade flows and heteroscedasticity. This estimator is called the Poisson pseudo-maximum likelihood (PPML) estimator. Today,

there is a series of different estimators designed to overcome problems with zero trade flows and heteroscedasticity, but the PPML estimator is the most common.[7]

The second new element that has been introduced into the gravity model since around 2007 is the inclusion of domestic trade (Bergstrand et al., 2015; Head and Mayer, 2014; Yotov et al., 2016). It is now common to include not only country-to-country trade flows but also domestic trade flows, typically measured by gross production minus exports. The motivation for this addition is the recognition that gravity estimation also must take into account the shift from domestic to international trade (from domestic to foreign suppliers). All in all, this means that today's gold standard gravity model often uses the PPML estimator in combination with the two sets of fixed effects mentioned above and domestic trade flows.[8] Due to the quick adoption of this approach among empirical trade economists we label it "the new gold standard".

3.3 Our model

Reviewing the empirical literature can be confusing. Different studies come up with different estimates for a given RTA. In this report, we therefore apply different estimation strategies in parallel, all of which are accepted in the research community. By doing this, we achieve two objectives. First, we can indicate how and why the estimated RTA effect varies across studies. Secondly, it gives us a range of effects and a sensitivity analysis. To make the presentation simple, we mainly focus on results from "the old gold standard" and "the new gold standard" of gravity analysis. Our preferred estimator is, of course, the new gold standard. The four estimation strategies that we include in our analysis are the following:

1. "The old gold standard": OLS with fixed effects.
2. Two intermediate steps towards the new gold standard:
   a) PPML with fixed effects but without domestic trade, and
   b) OLS with fixed effects and domestic trade
3. "The new gold standard": PPML with fixed effects and domestic trade.

Despite their differences and recent developments, all four models can be viewed as broadly accepted in the research community. To refine the gravity analysis, we also analyse the dynamic impact of RTAs over time. Specifically, we analyse the *cumulative* effect of RTAs over four periods. We refer to estimations up to five years before the agreement comes into effect [(t-5) – (t-1)] as the "anticipation effect", while [(t) – (t+4)] represents the short-term effect after the agreement comes into force, [(t+5) – (t+9)] represents the medium-term phase-in effect and [+10 years] represents the long-term phase-in effect. Added together, these four estimations represent the cumulative effect of an RTA. In regressions that do not apply such a dynamic approach, the result represents the *average* effect for the whole "post treatment" period.

Formally, our main statistical models (1–3) are the following:

$$lnX_{ijt} = \beta_{RTA} * RTA_{ijt} + \beta_{WTO} * WTO_{ijt} + \pi_{it} + \chi_{jt} + \mu_{ij} + \epsilon_{ijt}$$

in the case of OLS, and

$$X_{ijt} = e^{[\beta_{RTA} * RTA_{ijt} + \beta_{WTO} * WTO_{ijt} + \pi_{it} + \chi_{jt} + \mu_{ij}]} + \epsilon_{ijt}$$

in the case of PPML.

Here, X_{ijt} denotes exports from country i to destination j in year t; RTA_{ijt} is an indicator variable marking the existence of an RTA in force between country pair ij in year t; π_{it} and χ_{jt} are exporter and importer time-fixed effects; μ_{ij} represents country-pair fixed effects; and ϵ_{ijt} is an error term, presumed uncorrelated to our explanatory variables. β_{RTA} is our term of primary interest. It captures the trade effect of an individual RTA (or the average trade effect of several RTAs bundled together, depending on specification). Similarly, β_{WTO} captures the trade effect of WTO membership. In the models where we estimate dynamic effects, we replace the term $\beta_{RTA} * RTA_{ijt}$ with

$$\beta_{RTA,t-5} * RTA_{ijt-5} + \beta_{RTA,t} * RTA_{ijt} + \beta_{RTA,t+5} * RTA_{ijt+5} + \beta_{RTA,t+10} * RTA_{ijt+10}$$

where the subscripts t-5, t+5, and t+10 refer to leads and lags of the variables indicating the presence of an RTA.

4 Data

4.1 Trade data

Data on trade in goods among 244 countries over the period 1962–2017 have been collected from UN Comtrade and were accessed via World Integrated Trade Solution (WITS). We use data reported by importing countries (rather than exporting) because import data are generally considered more reliable. We have furthermore combined information in SITC revisions 1 through 4 to achieve maximum coverage of bilateral trade in goods. We use yearly data at the highest level of aggregation, i.e. total exports of goods, denominated in USD, from country i to country j during one year.[9] This is the only occasion when we deviate from recommendations by Yotov et. al (2016), who use period data, in their case rolling four-year averages. The reason we opt to use yearly data is that it preserves as much information as possible in the dataset. In total, our trade data contains 875 533 observations. Only a very small fraction of these (0,003 percent) are zero-valued trade flows.

Following Yotov et al. (2016), we complement international goods flows with intra-national flows. Recall that intra-national trade is defined as a country's gross production less its exports. In the report, we therefore refer to them as "domestic trade flows". Data on gross production come from the UNIDO database.

4.2 RTA data

For the gravity analysis we extracted and coded data for all but 16 of the 312 RTAs listed in the WTO RTA database in May 2019.[10] In addition, we coded four FTAs between former European Free Trade Agreement (EFTA) member states (Sweden, Finland, Austria, and Portugal) and the EU that are no longer in force but were considered economically important for the purpose of this report. A list of the 300 agreements (296+4) in our RTA data set, including participants and entry dates, is available upon request.

If the final entry into force of an agreement differs from its provisional application, the date of provisional application has been used, because this is the date when most tariffs are eliminated or reduced. Agreements that entered into force (or were provisionally applied) after October 1st of a given year were coded as if they came into force the following year.

4.3 RTA classification

Since one of our objectives is to measure the effects of different categories of trade agreements, all RTAs were classified into four categories according to level of ambition.

The RTA classification used in Kommerskollegium (2018) was based on Frankel (1997) and had six categories: (i) non-reciprocal preferential trade arrangements, (ii) reciprocal preferential trade agreements, (iii) free trade agreements (FTAs), (iv) customs unions (CUs), (v) common markets, and (vi) economic unions. This

categorisation is not entirely appropriate when analysing EU RTAs, however. The problem is that there will be no or very few agreements in categories (i) and (iv-vi), whereas category (iii) will contain the bulk of all EU RTAs. Therefore, we developed a new classification for EU RTAs based on the European Commission's taxonomy (European Commission, 2018b).

To do this, we collapsed Frankel's categories 4, 5, and 6 (customs unions, common markets, and monetary unions) into one group (category 4). We then split EU FTAs into two groups based on level of ambition. Category 2 contains agreements that the European Commission (2018b) calls "first generation FTAs…negotiated before the 2006 'Global Europe Communication' and Stabilisation and Association Agreements (SAAs) with Western Balkan countries". The last FTA to enter into force in this category was the EU-Serbia agreement from 2010. The other FTA group (category 3) contains seven EU FTAs concluded after 2010 that the European Commission (2018b) refers to as either "new generation FTAs" or "deep and comprehensive FTAs (DCFTAs)". According to the European Commission's 2006

Global Europe Communication, new generation EU FTAs "must be more comprehensive, more ambitious and broader". In our new classification, category 3 FTAs are regarded as more ambitious in this sense, which corresponds to RTA depth and scope.

Finally, category 1 contains countries previously covered by Cotonou preferences that were later replaced by economic partnership agreements (EPAs). In the WTO's RTA database, EU EPAs fall in the FTA category, i.e. they are notified under GATT, but they are no doubt less ambitious among EU RTAs. Consequently, the European Commission covers EPAs in a separate category in its yearly FTA implementation report (European Commission, 2018b).

This leaves us with the following categorisation:
1. EU economic partnership agreements
2. EU FTAs enacted until 2010 ("first generation" FTAs)
3. EU FTAs enacted after 2010 ("new generation" FTAs and DCFTAs)
4. EU customs unions and single-market integration agreements

5 Overview of EU trade with key RTA partners

This section provides an overview of EU trade, both compared to global trade and in relation to its RTA partners. We do not yet control for all the factors that may influence trade between two parties, i.e. the RTA effect is not isolated. The graphs and descriptions therefore serve as a point of reference for the discussion in the rest of the report, where the objective is to isolate the effects of the RTAs. The data used here are the "raw" trade data, i.e. the same data that are used in the econometric analysis in Sections 6 and 7.

5.1 EU trade in goods

The EU has gradually expanded over time through the accession of new member states. Consequently, the EU's total exports and imports have increased. However, when holding constant the 28 countries that are members of the EU at the time of writing, the EU's total trade has also grown rapidly.

The EU's trade development over time is similar to the global trade pattern (Figure 1). Up until the late 1990s, world trade flows increased gradually. This was followed by a remarkable boom from the early 2000s up to mid-2008, when the

Figure 1. Export of Goods 1962—2017   EU28 (intra+extra)   EU28 (Intra)   World [right axis]
Trade Value — Billions of USD, Current Prices.
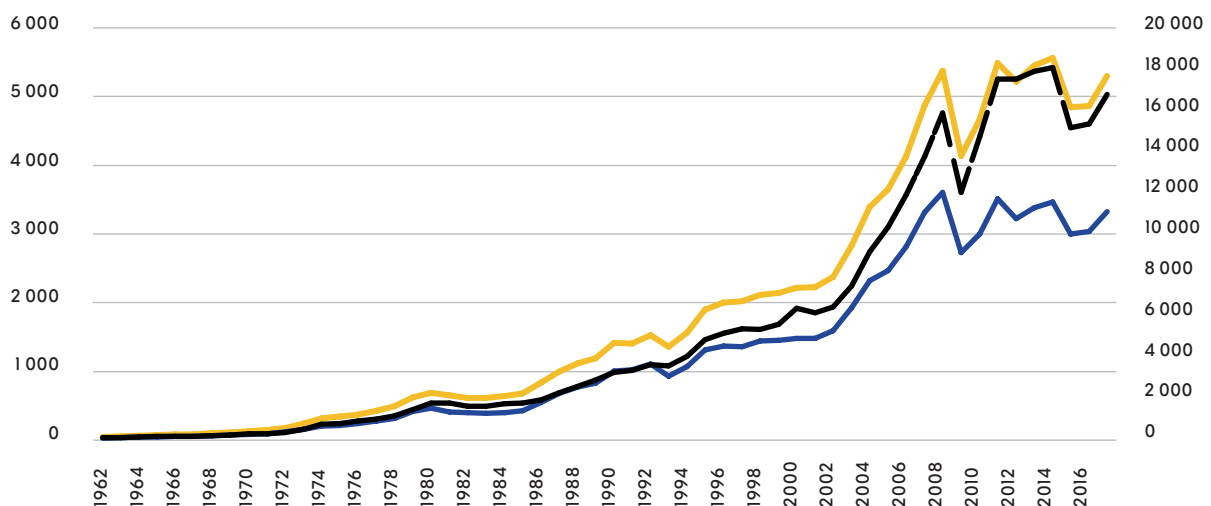
Figure 2. Export of Goods 1980—2017

Trade Value — Billions of USD, Constant Prices 2000

── EU28 (intra)   - - - World [right axis]
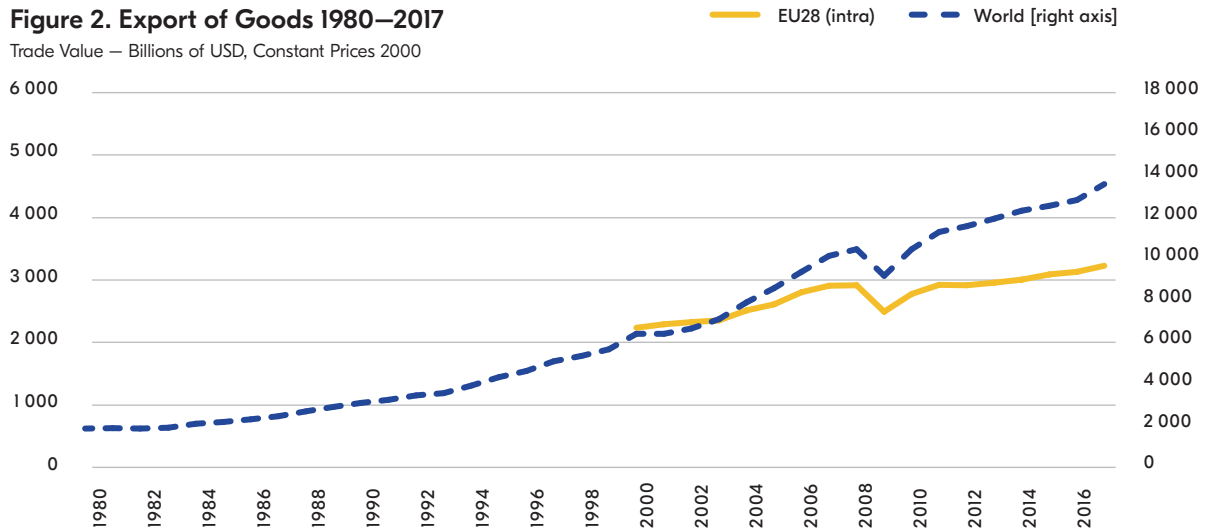
Source: WITS

global financial crisis broke out. During late 2008 and 2009, global trade fell sharply, before rebounding strongly in 2010 and 2011. Since then, trade growth has been unusually moderate, both compared to its historical growth rate and relative to GDP growth.

Real trade volume changes (i.e. trade value changes in constant prices) have in general been less volatile than value changes (current prices). Notably, there has been no declining global growth rate in the last decade (Figure 2).[11] EU export growth has also been positive during the last decade, but not as strong as world exports.

Other countries, in particular in Asia, have had strong trade growth during the same time period.

Intra-EU trade (exports and imports) account for just over 60 percent of total EU exports and imports. In other words, slightly less than 40 percent of the exports and imports of the EU members go to and come from countries outside the EU. These ratios have not changed significantly over time (Figure 3). During the last decades, the EU has concluded several external RTAs with countries from all over the world. During the same period, EU integration has both widened and deepened.

Figure 3. EU-Extra Trade of Goods as percentage of total EU Trade of Goods

····· import   ── export
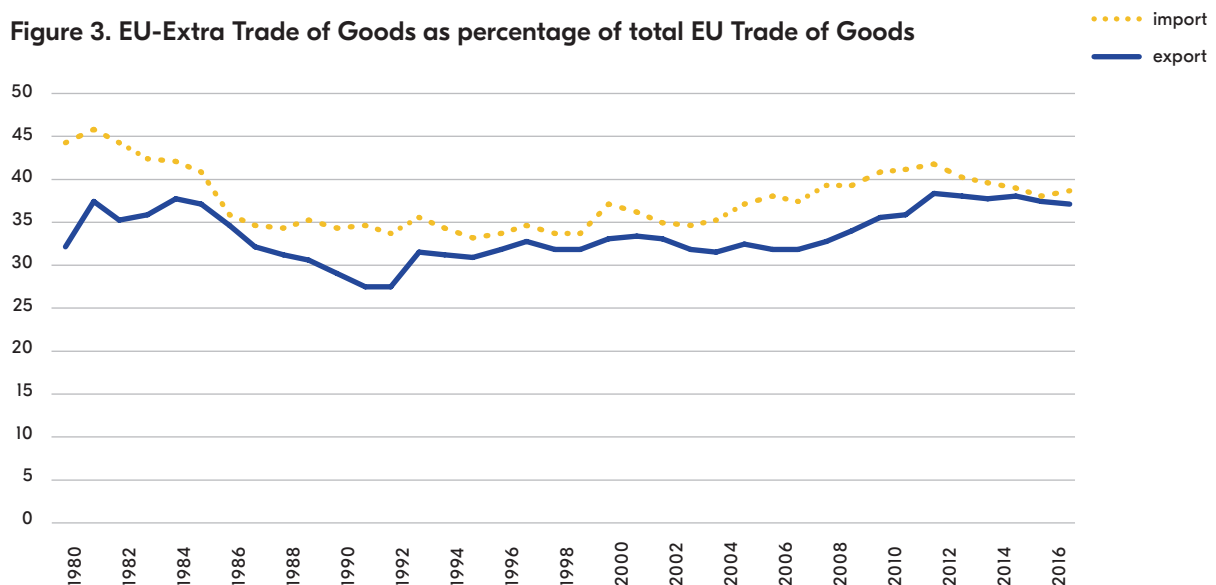
Source: WITS

5.2 EU trade with RTA partners

At the end of 2018, the EU had around 40 RTAs with countries all around the world, covering almost 70 markets. As can be seen in Table 1, the largest RTA category is category 2, i.e. first-generation FTAs that came into force before 2010. In recent years, starting with the EU–Korea free trade agreement, the EU has negotiated or is negotiating more comprehensive trade agreements, such as the trade agreement with Canada (CETA)—category 3 according to our classification.

In the following, we present the development of EU exports and imports with its RTA partners. For each partner category, we have calculated the simple average percentage change in exports and imports over five- and ten-year periods, before and after the agreements entered into force.

Table 1. EU's RTA 1990-2019 sorted by category 1—4

Category 4: Andorra, EEA, Turkey, Faroe Island, Switzerland, San Marino

Category 3: South Korea, Central America, Peru, Colombia (Andean), Moldavia, Georgia, Ukraine, Canada, Ecuador (Andean), Japan

Category 2: Israel, Palestine, Tunisia, Morocko, South Africa, Mexico, North Macedonia, Jordan, Croatia, Chile, Lebanon, Egypt, Algeria, Albania, Montenegro, Bosnia and Herzegovina, Serbia

Category 1: Cariforum, Papua New Guinea (Pacif), ESA, Fiji (Pacific), Cameroon, Côte d'Ivoire, Ghana, SADC, Mozambique (SADC), Comoros, Samoa (ESA)

X-axis: 1990, 1994, 1998, 2002, 2006, 2010, 2014, 2018

Note: EU RTAs according to year of entry into force on the x-axis and categorisation according to level of ambition on the y-axis.
Category 1: EU economic partnership agreements. Category 2: EU FTAs enacted until 2010 ("first-generation" FTAs).
Category 3. EU FTAs enacted after 2010 ("new generation" FTAs and DCFTAs). Category 4: EU customs unions and single-market integration agreements.
Source: Kommerskollegium

Table 2: Average Change (%) in EU Trade with RTA Partners
Current prices

RTA Category		EU exports		EU imports	
		Pre-RTA	Post-RTA	Pre-RTA	Post-RTA
Total					
	Five years	34	46	48	57
	Ten years	231	131	141	125
1: Economic partnership agreements					
	Five years	49	-7	71	5
	Ten years	596	-	76	-
2: "First-generation" FTAs					
	Five years	32	56	47	92
	Ten years	116	135	152	133
3: "New-generation" FTAs and DCFTAs					
	Five years	44	22	39	-21
	Ten years	253	-	211	-
4: Customs unions (CU) and single-market integration agreements (SM)					
	Five years	25	50	42	31
	Ten years	99	115	110	104

On average, EU exports of goods to the RTA partners grew in all periods, both before and after an agreement entered into force.[12] Exports increased more in the five-year period after an agreement entered into force than during the preceding five-year period. However, looking at ten-year windows, exports increased more in the ten-year pre-RTA period than in the ten-year post-RTA period. The numbers look similar for EU imports from RTA partners.

It is important to note that the development in trade fluctuates significantly across agreements, and for some agreements the development is even negative. This is even true when comparing agreements in the same category as well as agreements that entered into force the same year. Nevertheless, the numbers still provide an overview of the trade development between the EU and its RTA partners before and after the RTAs.

When splitting the agreements into our four categories, one can note that the average growth rates for exports to countries in categories 2 and 4 ("first-generation FTAs" and CU/SM) were stronger during the post-RTA period than in the pre-RTA period. This holds for both the five- and ten-year periods. By contrast, for categories 1 and 3 (EPAs and "new-generation" FTAs), growth rates were stronger in the pre-period than in the post-period.

As regards the average growth rates for EU imports from RTA partners, the results are even more mixed. It is only for category 2 that the growth rate is stronger during the five-year post-RTA period than in the pre-RTA period. It is interesting to note that there is a strong increase in imports before the agreements entered into force.

There might be several reasons for a stronger growth rate in the pre-periods. For instance, there may be cyclical explanations, e.g. that the agreement was concluded at the end of a boom. Exchange rate fluctuations might also affect the outcome, as the trade values are expressed in current prices. Another explanation could be that there is an anticipation effect: when firms know that an RTA is about to come into force, they might want to advance their investment plans or reorganise their supply chains before the agreement comes into effect.

Yet another aspect that can affect the results is the fact that there are not always "clean" pre-periods. For example, all partners in category 1, as well as some countries in categories 2 and 3, were previously covered by the EU's unilateral preferences (Cotonou preferences and/or GSP), which could affect the results for EU imports. Note also that in categories 1 and 3, the calculations are based on only a few RTAs because many of the agreements in these categories had just recently been concluded.

Below, we take a closer look at EU trade with two significant RTA partners: Mexico and Korea.

The two agreements belong to different categories according to our RTA classification, and they entered into force during different decades. Annex 1 contains the corresponding data for all the individual EU RTAs.

5.2.1 EU-Mexico

The EU-Mexico Global Agreement covering trade in goods entered into force in 2000. In our RTA classification, the agreement belongs to "first generation FTAs" (category 2).

In the ten-year pre-period, EU exports grew by almost 200 percent.[13] Exports continued to rise after the agreement came into force, and grew by more than 100 percent over the first ten years.

With regards to imports to the EU, the growth was lower than for exports; it was 70 percent in the ten-year period before the agreement entered into force. As shown in Figure 5, EU imports increased by even more in the post-RTA period than in the pre-RTA period—by 175 percent during the first ten years after the agreement entered into force.

The blue, dotted line in the graph is the trend line calculated from the average growth in exports and imports ten years before the agreement entered into force. It shows how exports and imports would have developed if trade had continued to grow at the same pace as during the pre-period. As is evident in the graph, both the EU's exports to, and imports from, Mexico after the agreement entered into force increased more than the trend line suggests.

Figure 4—5. EU trade with Mexico

EU15 Export to Mexico, Trade Values — Millions of USD
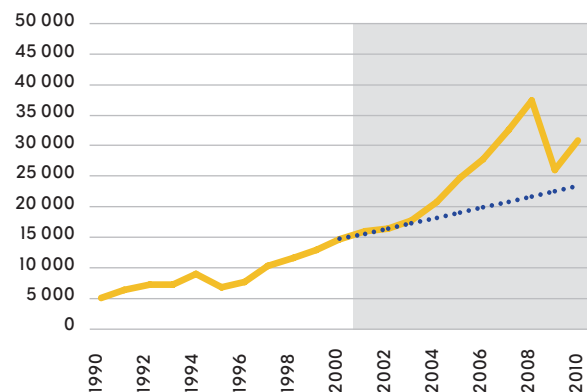
EU15 Import from Mexico, Trade Values — Millions of USD
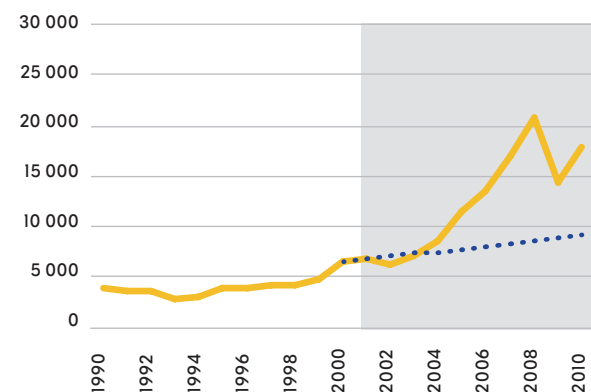
Source: WITS · · · · Trend growth (linear) based on 10y pre-RTA

5.2.2 EU-Korea

The free trade agreement between the EU and Korea has been provisionally applied since July 2011 and was formally ratified in December 2015. The EU–South Korea FTA is the first of a "new generation" of FTAs negotiated by the EU. In our RTA classification, it thus belongs to category 3 ("new-generation FTAs and DCFTAs").

Looking first at the development of EU[14] exports of goods to Korea, the increase was almost the same for the five-year period before as for the five years after the agreement entered into force (41 percent before vs. 47 percent after).

EU imports from Korea increased by about 20 percent in the five-year period before the agreement entered into force. In contrast, imports actually dropped by 12 percent in the first five years after the agreement. The post-period development of EU imports from Korea is well below the trend line, which is based on the linear development during the ten-year period before the agreement entered into force. As is evident in the graph, EU imports from Korea increased sharply between 2000 and 2008.

5.3 Summary

The "raw" trade figures provide mixed results regarding the question of whether EU trade has been stimulated by its RTAs. As we will discover later, however, the "raw" numbers may reflect many factors unrelated to the RTA. Isolating the RTA effect will therefore be addressed in the next sections.

Figure 6—7. EU trade with Korea

EU27 Export to South Korea, Trade Values — Millions of USD

EU27 Import from South Korea, Trade Values — Millions of USD
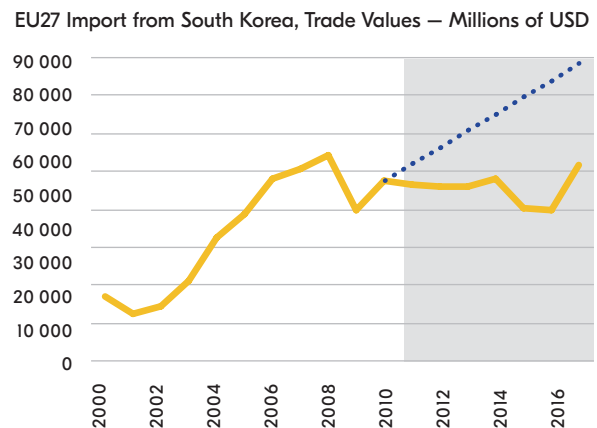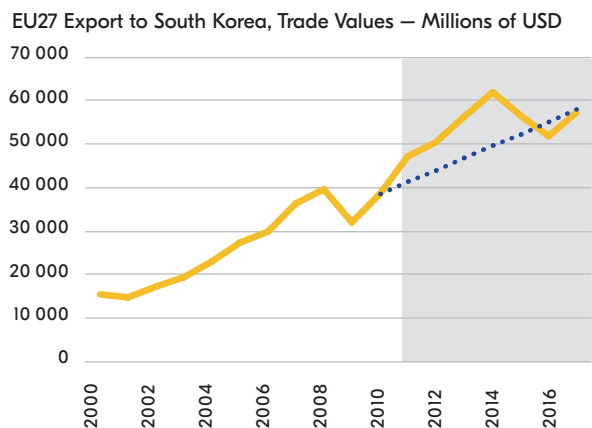
Source: WITS ····· Trend growth (linear) based on 10y pre-RTA

6 The EU trade effect

We now introduce the gravity analysis, and we begin by analysing the trade impact of EU membership and EU accession.

In Sections 6–8, all gravity regression results are shown in a series of figures (numbered 8–17). The associated regression tables with detailed estimation results can be found in Annex B. The figures can be interpreted as follows. The height of the bar shows the estimated impact on trade, whereas the dotted vertical lines represent the 95 percent confidence interval for the regression. That is, for each model we can be 95 percent confident that the "true' effect lies in the range indicated by the upper and lower limit of the interval. The estimate is therefore statistically insignificant if that vertical line crosses the x-axis, i.e. if the true effect is potentially zero.

6.1 The trade effect of EU membership

The trade effect of EU membership has been analysed repeatedly in the past, which allows us to compare our results with previous studies.[15]

According to our preferred "new gold standard" specification, the average trade effect of EU membership is 148 percent (right-hand bar of Figure 8). This means that, on average, trade with other EU members more than doubles as a result of EU membership.

When we compare the results from our two main models (the old and new gold standard), the estimated average post-period impact of EU membership rises from 93 to 148 percent. As expected, EU membership has a strong and

Figure 8. Trade effects of EU membership
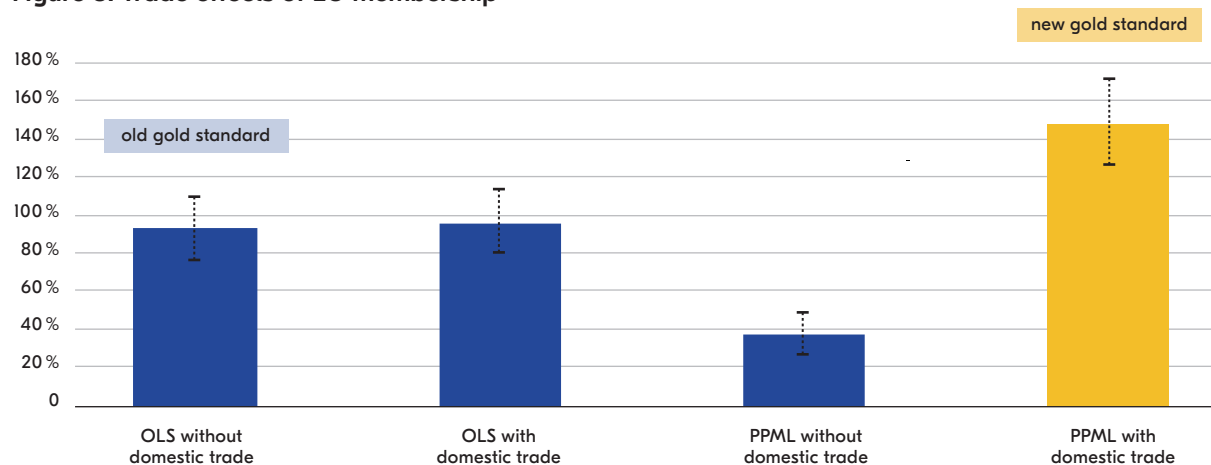
Note: Bar heights show the estimated impact on trade, whereas the dotted vertical lines represent the 95 percent confidence intervals for the regression. The right-hand bar is our "new gold standard" estimation, whereas the left-hand bar indicates the "old gold standard" result.

Source: Kommerskollegium

positive impact on trade. Among the four specifications, the PPML estimation without domestic trade stands out, with an estimated RTA impact below 40 percent. Controlling for EMU and Schengen membership yields statistically significant trade effects of 13 and 14 percent, respectively, in the new gold standard model (not shown in Figure 8, see Annex B, Table B12).

As discussed in Section 5.2, RTAs may need a phase-in period to reach their full impact, and RTAs could also have anticipation effects. In the case of the EU, however, accounting for phase-in effects over ten years and a five-year anticipation effect do not change the results much. In our new gold standard specification, the effect after ten years is 139 percent, whereas the old gold standard indicates a 112 percent increase (see Annex B, Table B12).

To sum up, our EU estimates are broadly in line with typical estimations of the trade impact of EU membership (Kommerskollegium, 2018). All in all, we are thus comfortable that the results correspond well with what one would expect when running a state-of-the-art gravity model on the trade effects of the EU.

6.2 The trade effect of EU enlargements

The evolution towards today's EU with 28 member states (at the time of writing) has taken place over seven rounds of enlargement (Box 1). It is therefore relevant to study how the trade effects have varied over these enlargements.

Figures 9a-9g summarize the trade impact the seven EU rounds of enlargement. According to our gold standard specification, six of the seven rounds of EU enlargement increased trade between the EU and the acceding member(s) by between 30 and 119 percent. For the remaining round (1981), we find no statistically significant impact on trade.

1973 – United Kingdom, Ireland and Denmark
Twenty-one years after the founding of the European Coal and Steel Community, three EFTA member states—the UK, Ireland, and Denmark—joined the European Communities (EC). During the same year, the remaining EFTA states entered into bilateral free trade agreements with the EC. Among the three countries, Ireland is today a member of the Eurozone, and Denmark is a member of the Schengen area.

As shown in Figure 9a, trade between the original six EC members and the three acceding EFTA members increased by 83 percent (new gold standard column). It is worth emphasizing that the 83 percent estimate represents an average value for the observed period (1973–2017). As discussed above, it could take 10 years or more to capture the full effect of a trade agreement. Hence, for the first years, the impact on trade is likely to be less than 83 percent, while it is likely to be larger than 83 percent for later years.

Box 1

The Seven Rounds of EU Enlargement

1973: UK, Ireland, and Denmark
1981: Greece
1986: Spain and Portugal
1995: Sweden, Finland, and Austria
2004: Poland, Czech Republic, Slovakia, Hungary, Slovenia, Estonia, Latvia, Lithuania, Cyprus, and Malta
2007: Romania and Bulgaria
2013: Croatia

Figure 9a. Trade effects of the 1973 enlargement (UK, Ireland, Denmark)
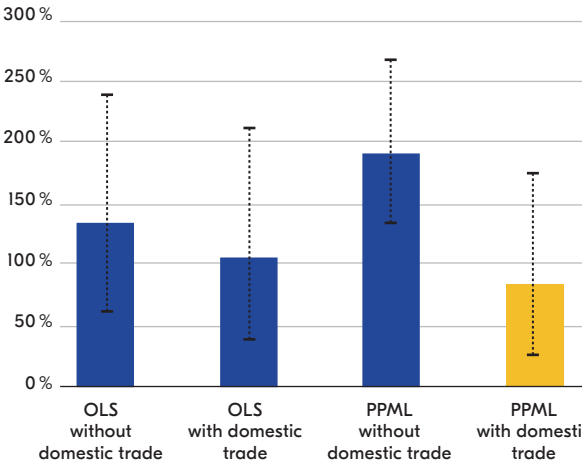
Note: Bar heights show the estimated impact on trade, whereas the dotted vertical lines represent the 95 percent confidence intervals for the regression.

Source: Kommerskollegium

1981 - Greece

In 1981, Greece joined the EC. It is a member of Schengen and joined the Eurozone in 2001. Our main gold standard regression in Figure 9b indicates no statistically significant impact on trade between Greece and the then nine EC members as a result of the Greek accession. In fact, the Greek enlargement is the only episode that consistently generates insignificant results across all four specifications.

A potential explanation for this result is the fact that a large part of Greek trade with the EU is in services, which is not picked up by our model. A quick glance at Greek trade shows that trade in services as a share of GDP has increased by more than 150 percent since 1981, whereas merchandise exports as a share of GDP increased by 75 percent during the same period.[16]

Figure 9b. Trade effects of the 1981 EU enlargement (Greece)

Note: Bar heights show the estimated impact on trade, whereas the dotted vertical lines represent the 95 percent confidence intervals for the regression.

Source: Kommerskollegium

1986 – Spain and Portugal

The 1986 accession of Spain and Portugal was the second part of the EU's Mediterranean enlargement. The trade policy context differed somewhat between the two countries in that Spain had no previous trade agreement with the EC, whereas Portugal was one of the EFTA members that entered into bilateral FTAs with the EC in 1973. Today, both countries are members of the Schengen area and the Eurozone.

In constrast to the results for Greece, the trade effects for Spain and Portugal indicate strong and

consistent results. The estimated increase in trade ranges from 57 to 110 percent across the four specifications, with the gold standard estimate at 110 percent.

Figure 9c. Trade effects of the 1986 EU enlargement (Spain, Portugal)

Note: Bar heights show the estimated impact on trade, whereas the dotted vertical lines represent the 95 percent confidence intervals for the regression.
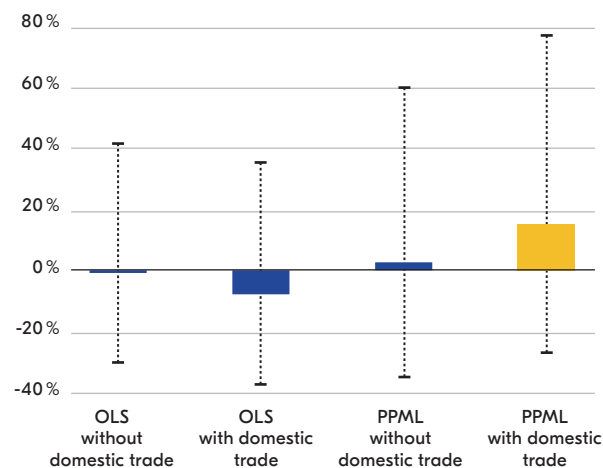
Source: Kommerskollegium

1995 – Sweden, Finland and Austria

Sweden, Finland, and Austria joined the EU in 1995. Like Portugal in 1986, the three countries were former EFTA countries that had previously had individual FTAs with the EU since 1973. Finland and Austria later joined the Eurozone, whereas Sweden remains outside. All three countries are Schengen members.

According to the new gold standard estimate, trade between Sweden, Finland, Austria, and the EU increased by 30 percent on average, as a result of the accession. The old gold standard approach indicates a stronger effect, 85 percent. The remaining two specifications indicate an 81 percent increase and an insignificant effect, respectively.

Given that we rely on the new gold standard as our main specification, EU accession for Sweden, Finland, and Austria seems to have had a moderately large impact on trade between the EU and the three acceding countries. A potential partial explanation for this lower-than-average EU accession result is the fact that trade flows among the three countries themselves are included in the regression. Because they already

had (mostly) free trade with each other within EFTA, this might have dampened the overall accession effect compared to other results reported in this section. The same reasoning is not applicable to Portugal because the other acceding country in 1986—Spain—was not an EFTA member, and the two countries traded on a most-favoured-nation basis before joining the EU.

Figure 9d. Trade effects of the 1995 EU enlargement (Sweden, Austria, Finland)

Note: Bar heights show the estimated impact on trade, whereas the dotted vertical lines represent the 95 percent confidence intervals for the regression.
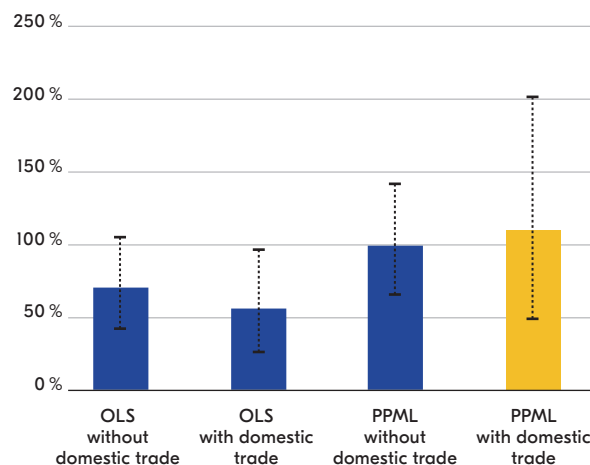
Source: Kommerskollegium

2004 - Central and eastern Europe and the Mediterranean

The 2004 enlargement with countries from central and eastern Europe and the Mediterranean brought 10 new member states to the EU: Poland, the Czech Republic, Hungary, Slovakia, Slovenia, Estonia, Latvia, Lithuania, Malta, and Cyprus. At the time of accession, that meant that a number of lower-than-average-income countries entered the union. Along with the 1981, 1986, 2007, and 2013 enlargements, this is therefore a potentially good case study of the trade effects from economic integration between relatively high- and low-wage countries. In theory, eliminating barriers to trade and investment between high- and low-income countries should stimulate inter-industry trade and vertical investment flows.[17]

Out of the ten countries that acceded in 2004, seven have since joined the Eurozone, whereas three remain outside (Poland, the Czech Republic, and Hungary). Only Cyprus is not yet part of the Schengen area.

According to the new gold standard estimate shown in Figure 9e, trade between the EU and the 10 acceding countries increased by 108 percent as a result of the 2004 enlargement. By comparison, the old gold standard approach indicates a 70 percent increase.

Figure 9e. Trade effects of the 2004 EU enlargement

Note: Bar heights show the estimated impact on trade, whereas the dotted vertical lines represent the 95 percent confidence intervals for the regression.
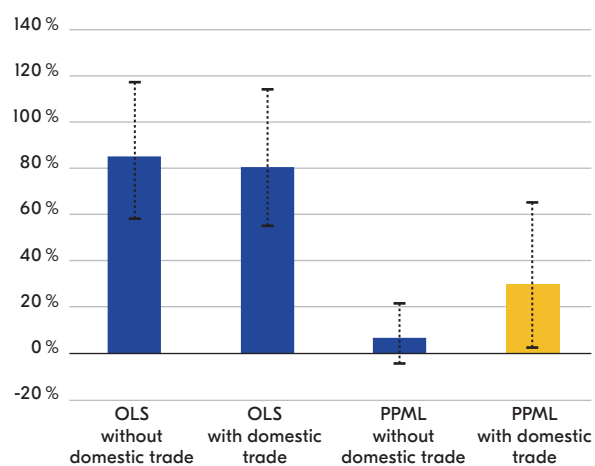
Source: Kommerskollegium

2007 – Bulgaria and Romania

In 2007, Bulgaria and Romania acceded to the EU. Some restrictions on the freedom of movement in some old member states were maintained until the end of 2014, and both countries remain outside Schengen and the Eurozone. Bulgaria is scheduled to join the Euro in 2022 or 2023.

According to our gold standard estimate, trade between the EU25 and Bulgaria and Romania increased by 78 percent as a result of EU accession. The old gold standard provides a higher estimate, 97 percent.

Figure 9f. Trade effects of the 2007 EU enlargement (Romania, Bulgaria)

Note: Bar heights show the estimated impact on trade, whereas the dotted vertical lines represent the 95 percent confidence intervals for the regression.

Source: Kommerskollegium

2013 – Croatia
Croatia became the second former Yugoslav republic to join the EU in 2013. Croatia was recently given the green light by the European Commission to join Schengen and is scheduled to join the Euro in 2022 or 2023.

Figure 9g. Trade effects of the 2013 EU enlargement (Croatia)

Note: Bar heights show the estimated impact on trade, whereas the dotted vertical lines represent the 95 percent confidence intervals for the regression.
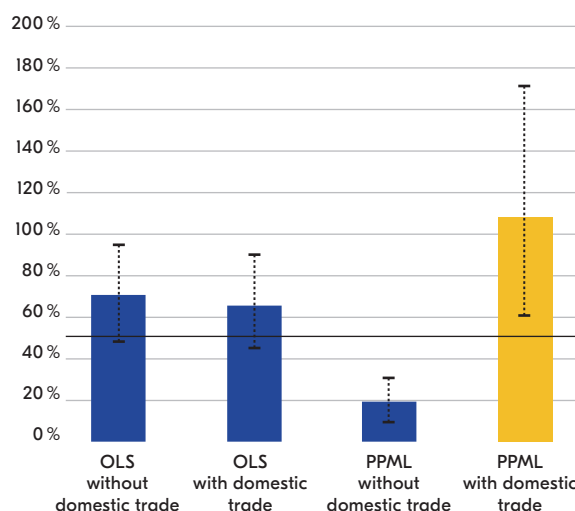
Source: Kommerskollegium

According to the new gold standard estimate, trade between the EU and Croatia increased by 119 percent as a result of accession. The strong result is particularly notable because the post-treatment period is only five years (2013–2017). Normally, we would expect a trade agreement to reach its full potential after 10 years or more.

To sum up, the largest impact on trade is found for the 2013 enlargement (Croatia), followed by 1986 (Spain and Portugal), 2004 (central and eastern Europe and the Mediterranean), 1973 (UK, Ireland, and Denmark), and 2007 (Romania and Bulgaria). Results for these five rounds of enlargement range between 78 and 119 percent. The 1995 enlargement (Sweden, Finland, and Austria) takes an intermediate position with a 30 percent trade increase. At the low end of the spectrum, we find the Greek enlargement (1981) with no statistically discernible impact on trade.

7

The trade effects of EU RTAs

Having examined the trade effects of being or becoming an EU member, we now turn to the main question in this report: how much do EU RTAs stimulate trade? As in Section 6, we estimate both the average effect for the "post-treatment" period and the accumulated trade effect after ten years, taking anticipatory and phase-in effects into account. Another important issue is the observation that EU RTAs can be very different in terms of depth and scope. Consequently, it is relevant to examine whether the effect differs depending on the level of ambition of the agreement.

As discussed in Section 4, we coded 300 RTAs, in other words almost all RTAs in the WTO's RTA database. Of these, 44 are EU RTAs that were either (a) in force at the end of 2017 or (b) regarded as economically significant during the period of investigation (1962–2017) but are no longer in force.[18]

7.1 The average trade effect of EU RTAs

According to our new gold standard specification, EU RTAs stimulate trade between the EU and the partner country by 48 percent on average (Figure 10). When we instead use old gold standard estimation, EU RTAs increase trade by 15 percent on average. In the two remaining specifications, the result is 17 percent in one case and insignificant in the other. It is notable that the specification that generates insignificant results for EU RTAs also generates insignificant results for non-EU RTAs (not shown in Figure 10; see Annex B, Table B3).

Two things may be emphasized when analysing the results in Figure 10. First, as mentioned before, it often takes time for an RTA to reach its full potential. As a result, the average effect typically does not correspond with the full (accumulated) RTA effect. Secondly, the new gold standard estimate of 48 percent represents a simple average. This means that relatively large trade flows (say EU trade with Canada or Norway) have the same weight as very small trade flows in the calculation. Hence, the average effect does not necessarily reflect the *economic* impact of an RTA.

Figure 10. Average trade effect of EU RTAs
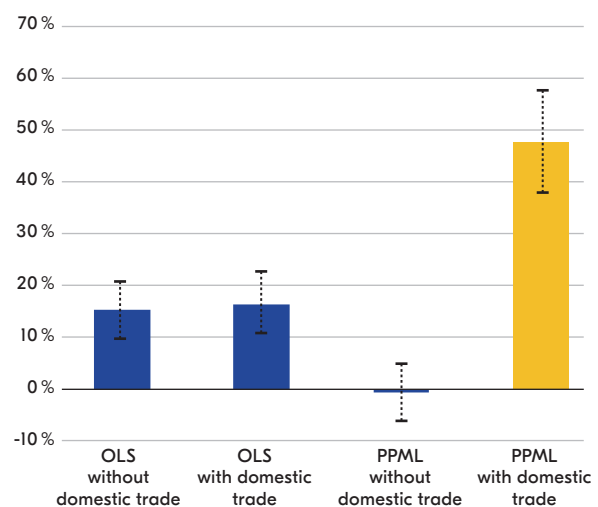
Note: Bar heights show the estimated trade effect, whereas the dotted vertical lines represent the 95 percent confidence intervals for the regression.
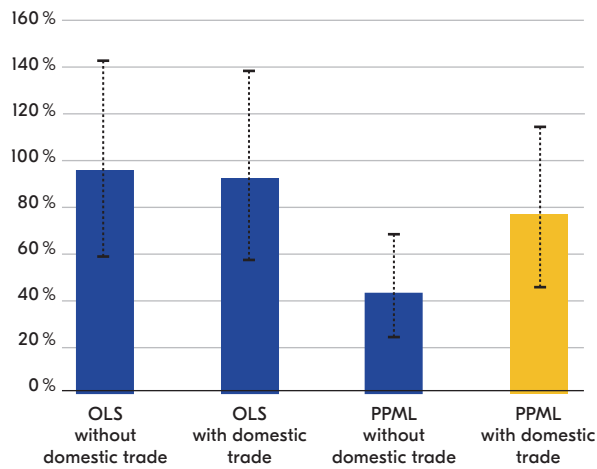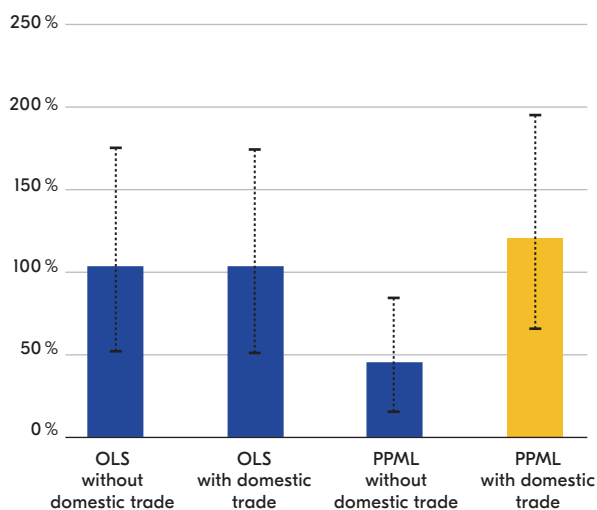
Source: Kommerskollegium

7.2 The trade effect of EU RTAs after ten years

Figure 11 shows how the main result changes when we allow for anticipation effects and a ten-year phase-in period. Introducing time dynamics leads to an increase in the estimated impact of an RTA from 48 to 65 percent. In this case, the increase represents a phase-in effect, because the regression did not pick up any statistically significant anticipation effect. In other words, our results do not confirm conclusions by Lakatos and Nilsson (2017) and others regarding anticipation effects, at least not across all EU RTAs.

Figure 11. The trade effect of EU RTAs after ten years
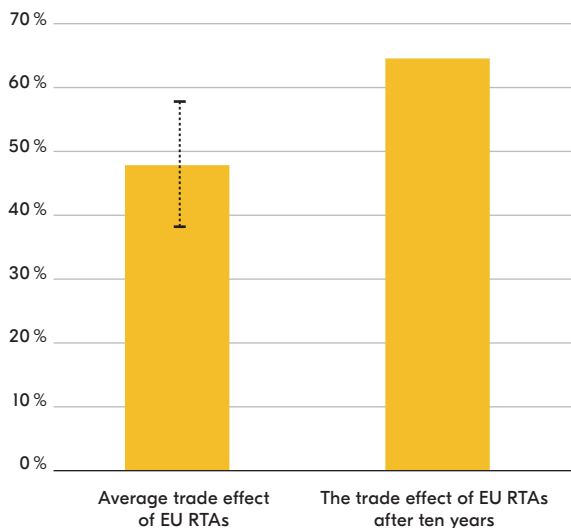
Note: Bar heights show the estimated trade effect, whereas the dotted vertical lines represent the 95 percent confidence interval for the regression. We did not calculate confidence intervals for the accumulated ten-year effect. As regression results in table B.4. of Annex B show, however, all lagged coefficients are statistically significant, but not the lead t-5 coefficient.

Source: Kommerskollegium

7.3 Trade-weighted effects of EU RTAs

In the second column of Figure 12 we experiment with a weighted regression, where the weights are proportional to the size of the trade flows. This means that the estimated effect reflects the economic- rather than the average effect of an agreement. For policy evaluations, having this kind of information is valuable since it takes the relative size of the economic value into account.

According to Figure 12, the average trade effect from EU RTAs increases from 48 to 56 percent when we use a trade-weighted regression. In other words, the effect of EU RTAs appears to be stronger for large than for small and sporadic trade flows.[19]

Figure 12. The trade trade-weighted effect of EU RTAs
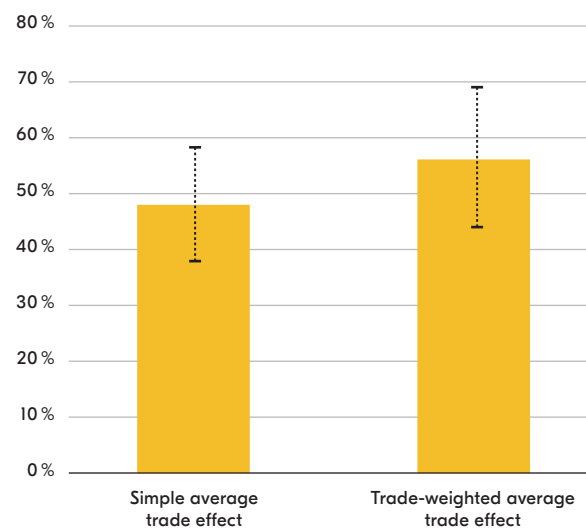
Note: Bar heights show the estimated trade effect, whereas the dotted vertical lines represent the 95 percent confidence intervals for the regression. The trade-weighted estimate is experimental and should be interpreted with caution.

Source: Kommerskollegium

7.4 The trade effect of EU RTAs by category

In this section, we analyse the trade effect of EU RTAs by category. In Table 3, we list our four EU RTA categories, ranging from a relatively low (category 1) to a high (category 4) level of ambition with respect to economic integration.

Figures 13a and 13b display regression results by RTA category. As a full free trade benchmark, we have added the results for EU membership. Generally, the impact of an agreement increases with level of ambition, a pattern that is robust with respect to estimation strategy. Starting with category 1 agreements (EPAs), it is striking that EU EPAs do not generate significant increases in trade between the EU and its partners. One explanation might be that for some EPAs, tariff liberalisation is phased in over as long as 25 years in the partner countries. Such a time frame is

arguably too long to affect current business decisions about sourcing, sales, and investment. Another reason for the absence of a significant EPA effect might be that there were preferences (Cotonou and/or GSP) in place before the EPAs entered into force. As a consequence, the EPAs offered little additional access to the EU market compared to the arrangements that were already in place. The trade effect of the EPAs might change over time as the commitments start to kick in for the partner countries, but currently EPAs appear to be ineffective in stimulating additional trade.

At the other end of the spectrum, deep agreements such as customs unions and single-market integration agreements (EU–Turkey, EEA etc.) generate a strong and positive effect on trade with an estimated increase of 111 percent on average. The old gold standard indicates a lower effect, 48 percent (not shown in Figure 13a; see Table B6, Annex B).

Table 3: EU RTAs by Categorys

Category 1: Economic Partnership Agreements (EPAs)	Category 2: FTAs before 2010	Category 3: FTAs after 2010	Category 4: CUs and single-market integration agreements
EU—CARIFORUM (Antigua and Barbuda; Bahamas; Barbados; Belize; Dominica; Dominican Republic; Grenada; Guyana; Jamaica; Saint Kitts and Nevis; Saint Lucia; Saint Vincent and the Grenadines; Suriname; Trinidad and Tobago)	EU—Chile	EU—Korea	EEA (EU—Norway, Iceland, and Liechtenstein)
EU—Pacific (Fiji and Papua New Guinea)	EU—Mexico	EU—Canada (CETA)	EU—Switzerland
EU—ESA (Madagascar, Mauritius, Seychelles, Zimbabwe)	EU—South Africa	EU—Ukraine, Georgia, and Moldova (DCFTA)***	EU—Faroe Islands
EU—Ghana	Euromed agreements (Israel, Egypt, Tunisia, Morocco, Algeria, Lebanon, Jordan, Palestine)*	EU—ANDEAN (Peru, Colombia, Ecuador)	EU—Turkey
EU— Côte d'Ivoire	Balkan stabilisation and association agreements (Albania, Northern Macedonia, Bosnia, Montenegro, Serbia, Croatia)**	EU—Central America (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama)	EU—Andorra
EU—Cameroon	EU—Norway, EU—Switzerland, EU—Sweden, EU—Finland, EU—Portugal, EU—Austria, EU—Iceland 1973		EU—San Marino
EU—SADC (Botswana, Lesotho, Mozambique, Namibia, South Africa, Eswatini)			

Notes: *Eight agreements enacted between 1996 and 2005. **Six agreements enacted between 2001 and 2016. ***Three agreements enacted 2014—2016.

Figure 13a. Trade effect of EU RTAs by category
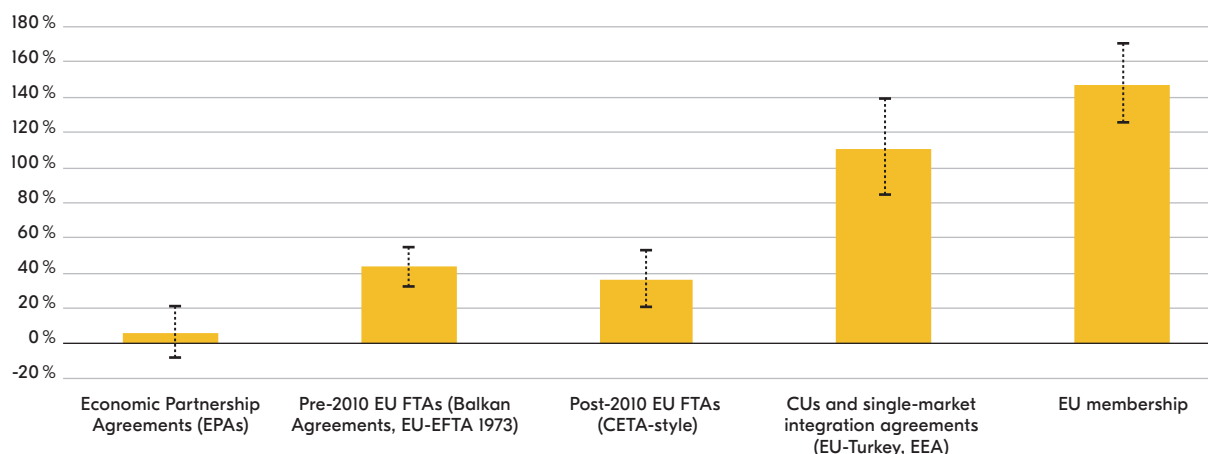
A somewhat surprising result shown in Figure 13a is the fact that pre-2010 FTAs appear to have stimulated trade more than post-2010 RTAs. When we study results for the underlying individual RTAs (see Section 7.3), however, it appears that results for the pre-2010 category are largely driven by the inclusion of seven EU–EFTA FTAs from 1973. To confirm this, we ran a separate regression where we divided category 2 into two separate groups: the seven EU–EFTA FTAs from 1973 and all other pre-2010 RTAs. In effect, the new category 2 then consists of EU FTAs that entered into force between 1996 and 2010. The result is shown in Figure 13b. Now the results for the new 1996–2010 RTA category are weaker (20 percent), whereas the results for the 1973

group are very strong (70 percent). Category 3 results remain the same. It thus appears that the 1973 EU–EFTA agreements are part of the overall European integration process, which tends to generate strong trade growth, particularly over time. Therefore, we regard Figure 13b as a more accurate reflection of the trade effects of different categories of *recent* EU RTAs.

As noted, we also added the impact on EU membership as a benchmark for the analysis in Figure 13a and 13b. Here it becomes clear that the trade effect of EU membership is the strongest with an estimated impact of 147 percent in Figure 13a. In our main specification, the effect of EU membership is four times larger than the impact of post-2010 EU FTAs, i.e. CETA-style FTAs.

Figure 13b. Trade effect of EU RTAs by category
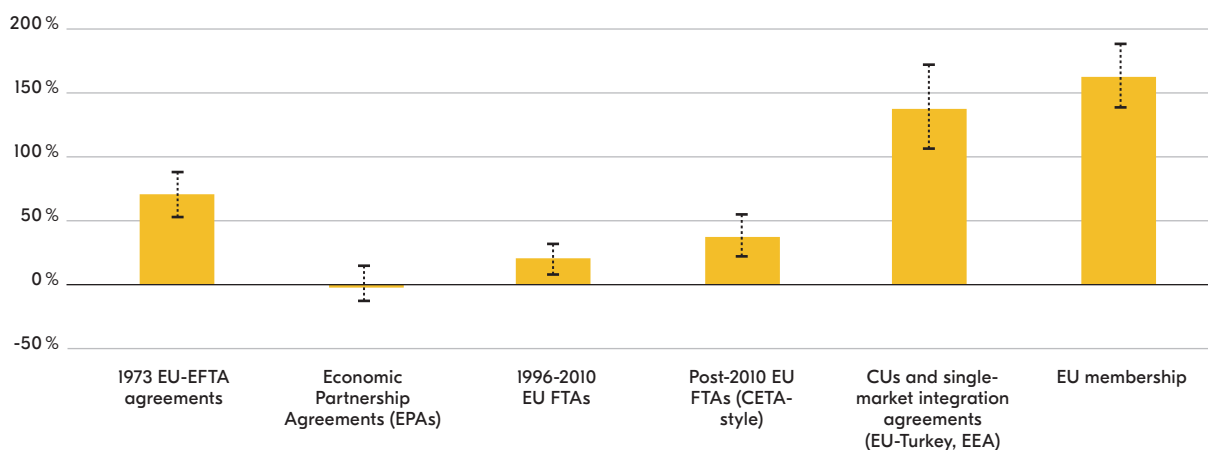
While there are some differences, our results are broadly in line with gravity estimations for EU RTAs by Soete and Van Howe (2017). Soete and Van Howe find weaker effects for customs unions (58 percent) compared to our category 4, but their estimates for all EU FTAs (26 percent) are similar to the results for our two FTA categories (2 and 3).

When we add time dynamics, most of the reported results in Figure 13a remain intact (Figure 14). EPAs remain unsuccessful in promoting trade, and EU membership remains the most effective. In fact, the trade effect of EU membership appears to continue to rise even after ten years. It is furthermore notable that, when we take time dynamics into account, post-2010 RTAs outperform pre-2010 RTAs even without removing the 1973 EU-EFTA group. (It is, of course, not possible to measure the effect ten years after an agreement came into force for post-2010 RTAs.)

To sum up, our results suggest that a high level of ambition is important for an agreement to have trade effects. It also appears that the phase-in effect increases with the depth and scope of the agreement. EU membership and CUs/single-market integration agreements have substantial phase-in effects. Importantly, no category indicates any statistically significant anticipation effects.

7.5 The trade effects of individual EU RTAs

As we move from an aggregate to a more fine-grained level of analysis (Figure 15), it is important to keep in mind that estimates of individual RTAs can be fragile. To keep the analysis simple, we focus on the results using the new gold standard procedure.

Overall, individual estimations confirm the results by RTA category. Among RTAs with the largest impact on trade we find EU-Turkey, EEA, and the EU-Ukraine DCFTA (i.e. EU custom unions and single market integration agreements). At the other end of the spectrum, we find EPAs such as EU-CARIFORUM.

It is encouraging to note that all recent EU RTAs, such as EU-Korea, CETA, ANDEAN and the three DCFTAs with Ukraine, Georgia and Moldova have statistically significant trade effects. The reader should keep in mind, however, that these results are sensitive, because the post-agreement period is relatively short. We recommend a careful interpretation of results from individual agreements in general and for individual and recent agreements in particular. However, the overall picture is that the capacity of new-generation EU FTAs to stimulate trade looks promising.

Figure 14: The cumulative trade effect of EU RTAs
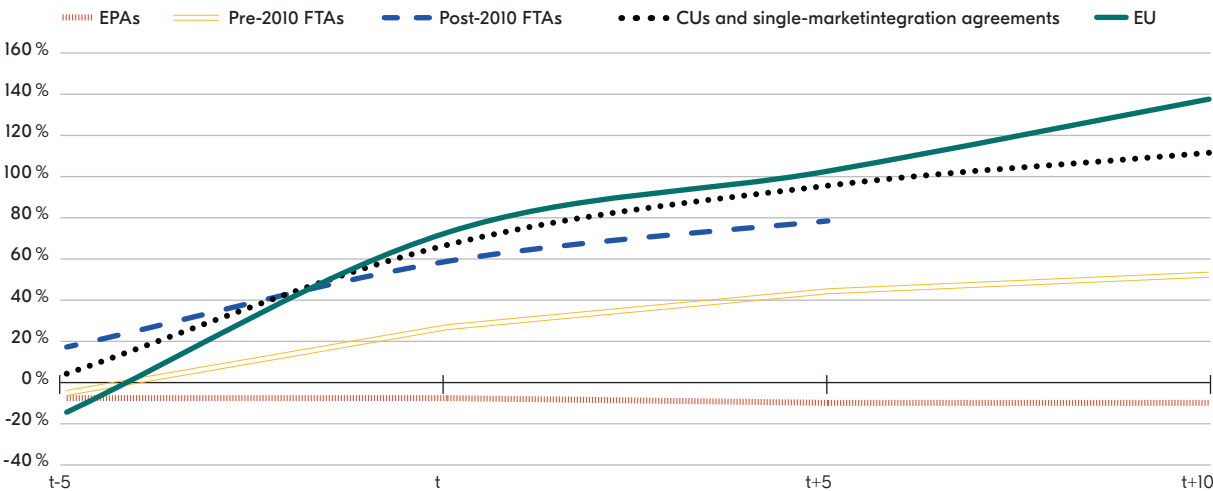
Note: t-5 measures the effect five years before an agreement enters into force, t+5 measures the effect five years after the entry into force and t+10 measures the effect after ten years. Regressions are based on the new gold standard routine: PPML with domestic trade.

Source: Kommerskollegium

Some agreements that are not shown in Figure 15 stand out in the sense that their impact on trade does not correspond to what we would expect when looking at the level of ambition alone. As mentioned above, the pre-2010 FTAs between seven EFTA members (Sweden, Finland.[20] Norway, Switzerland, Austria, Portugal, and Iceland) and the EU in 1973 generally display very strong trade effects despite the fact that they were limited to industrial goods and mainly tariffs. A potential explanation for this result is the fact that the 1973 EU-EFTA agreements took the trade relationship between the EU and the EFTA countries from GATT tariff levels (in 1973 applied most-favoured-nation tariff levels were still high), to duty-free treatment. In that context, one would expect trade to react strongly. Finally, the seven EU-EFTA agreements have an "advantage" in the sense that they reflect the average effect over a long period of implementation and have therefore reached their full potential.

More specifically, the 1973 EU-EFTA effect appears to have been particularly strong for Austria, Sweden, Finland, and Iceland (62-96 percent) with a medium impact for Portugal, Switzerland and Norway (36-49 percent).[21] For later Norwegian/Icelandic and Swiss European integration agreements (the EEA from 1994 and the Bilateral I agreement between EU and Switzerland from 2002), the trade effect is considerably stronger, however: +146 percent for the EEA and +91 percent for EU-Switzerland.

In Section 5, we surveyed trade between the EU and two representative RTAs for the pre- and post-2010 periods: the 2000 EU–Mexico Global Agreement and the 2011 EU–Korea FTA. We are now able to compare the "raw" trade development depicted in Figures 6–7 with our new gold standard gravity results for the two agreements. As seen in Figure 15, the EU–Korea FTA has stimulated bilateral trade between the EU and Korea by 36 percent. This is in line with the European Commission's (2018a) estimation that the agreement has increased EU exports to Korea by 54 percent and Korean exports to the EU by 15 percent (see Section 2). The trade effect from the EU–Mexico Global Agreement appears to be weaker and is statistically insignificant, again in line with a previous ex-post assessment from the European Commission (2017).

Our gravity estimations thus indicate that the EU-Korea FTA has been more effective in stimulating trade than the EU-Mexico agreement. Interestingly, the "raw" trade development reported in sections 5.2.1 and 5.2.2 gives the opposite impression. This shows how important it is to apply methods, such as gravity analysis, to separate the RTA effect from other factors that influence trade, when evaluating trade agreements.

Another pre-2010 FTA not discussed in Section 5 is the 2002 EU–Chile Association Agreement. According to our gravity results, the trade effect of the EU–Chile RTA is significant, with an average trade effect of 25 percent on bilateral trade.

Figure 15: Trade effect of selected individual EU RTAs
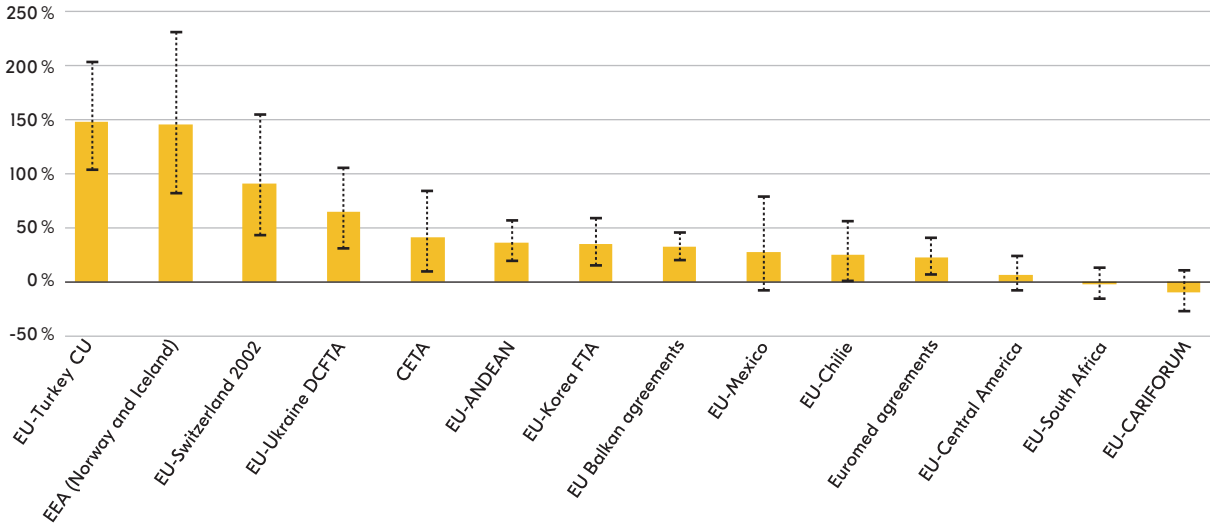
Note: Bar heights show the estimated trade effect, whereas the dotted vertical lines represent the 95 percent confidence intervals for the regression.

Source: Kommerskollegium

8 WTO membership

As mentioned in the introduction, trade liberalisation through the WTO has been replaced in recent years by trade reform in the context of RTAs. Is this strategy rational for major WTO members, or would a return to a strategy that prioritizes the WTO serve them better? To answer this question, we first compare the trade effects of WTO membership with the impact of RTAs. We then present gravity results of the WTO trade effects for a number of individual WTO members.

8.1 The trade effect of the WTO vs. RTAs

Referring to Figure 16, it is notable that the average WTO effect is stronger than the average RTA effect. In fact, the average WTO effect of 66 percent is more than 50 percent larger than the average RTA effect (40 percent). The strong result for trade effects of GATT/WTO membership is supported by new gold standard estimations by Larch et al (2019), who find that GATT/WTO could increase bilateral trade between member countries by as much as 171 percent and trade between member and non-member countries by 88 percent.

If we add to the analysis the observation that the WTO affects all combinations of bilateral flows of its 164 members simultaneously, while RTAs affect only bilateral or regional trade flows one by one, the overall performance of the WTO appears to be superior, at least if the policy objective is to stimulate trade.

Figure 16: Trade effects of GATT/WTO membership vs all RTAs
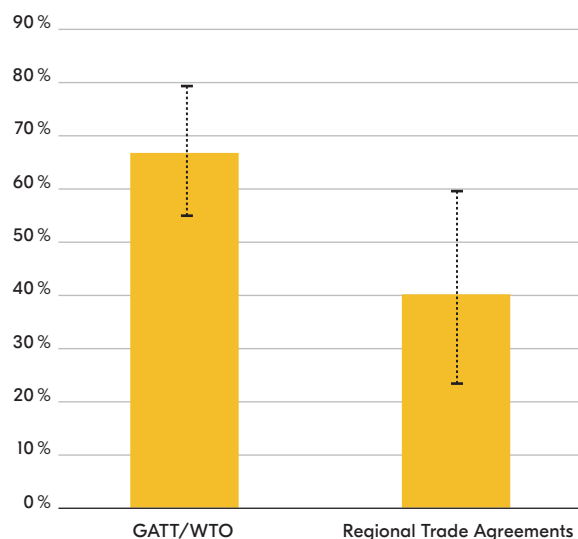
Note: Bar heights show the estimated trade effect, whereas the dotted vertical lines represent the 95 percent confidence interval for the regression. The RTA variable includes all but 16 of the RTAs in the WTO RTA database, all in all 296 RTAs. See footnote 10 for an explanation of why we did not code the remaining 16 RTAs.

Source: Kommerskollegium

In this context, it is worth noting that the 40 percent average figure for all the 296 RTAs coded for this project (right-hand bar in Figure 16) corresponds to an accumulated 61 percent increase after ten years, i.e. when we include anticipation and phase-in effects (see Table B10 in Annex B). In our 2018 survey of the literature (Kommerskollegium, 2018), we concluded that "the average trade increase of RTAs after ten years is in the range of 50–125 percent." Because 61 percent is at the low end of that range, it suggests that

some of the studies surveyed may have overestimated the trade effect of RTAs. A partial explanation for this could be the fact that many of the studies that we surveyed used the old gold standard of gravity estimation. In addition, we note that many old gold standard studies cover a smaller subset of RTAs than the approximately 300 RTAs that are currently recorded in the WTO's RTA database. Many studies also have a shorter time frame to work with.

It is perhaps particularly interesting to contrast our results with those of Baier and Bergstrand (2007), who find that "on average, an FTA approximately doubles two members' bilateral trade after ten years". In this case, the main discrepancy compared with our results seems to arise from the choice of variables, rather than the choice of estimation strategy. For instance, Baier and Bergstrand did not control for GATT/WTO membership, and they included the EU itself in the RTA variable (in our regressions, EU membership enters as a separate variable). When we ran a separate regression, using the new gold standard estimator with the same set of fixed effects as in Baier and Bergstrand, but one that (a) does not include GATT/WTO membership as a control variable and (b) includes the EU in the RTA variable, the resulting estimate rises from 62 percent to 113 percent. This happens to be exactly what Baier and Bergstrand (2007) report as their accumulated OLS estimate for RTAs after ten years.

8.2 The WTO effect for individual members

Finally, it is interesting to look at the trade effect of the WTO for a sample of influential WTO members. As seen in Figure 17, the WTO effect is above the average 67 percent for three of the depicted countries. More specifically, the estimated GATT/WTO trade effect is 193 percent for India, 98 percent for the US, 79 percent for China, 65 percent for the EU, 61 percent for Brazil and 58 percent for Japan. In other words, the abandonment of a trade policy that prioritizes the WTO does not appear to be in the interest of major WTO economies.

Figure 17: The trade effect of the GATT/WTO for individual members
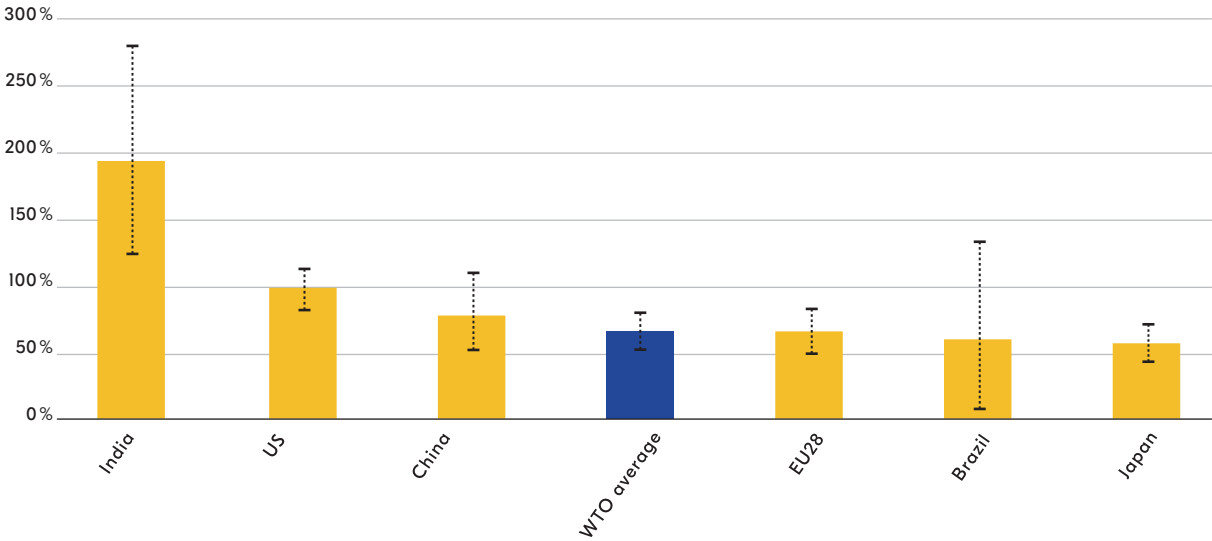
Note: Bar heights show the estimated trade effect, whereas the dotted vertical lines represent the 95 percent confidence intervals for the regression.

Source: Kommerskollegium

9 Summary and conclusions

During the last 30 years, the number of RTAs in the world has increased, from 28 in 1990 to 302 agreements in May 2019 (WTO RTA database). During the same period, most of the EU RTAs came into force. As of September 2019, the EU had 42 active RTAs in place. Currently, the EU is in the process of negotiating a number of new or updated RTAs.

In order to benchmark different types of integration strategies, we have compared the trade effects of EU-membership (overall and per expansion) with the effects of EU RTAs (overall, by category, and for individual agreements) and the WTO (overall effects as well as effects for large WTO members).

9.1 Summary of results

According to our main estimate, EU RTAs increase trade between the EU and its partners by 48 percent on average. With trade-weighted estimations, the effect increases from 48 to 56 percent.

Our analysis also reveals substantial phase-in effects from EU RTAs. After ten years of operation, the estimated trade effect is 65 percent. We find no evidence of anticipation effects of EU RTAs, i.e. effects that can be observed before an agreement enters into force. A possible explanation for this is the fact that we adjusted the starting point of each RTA to the date from which it was provisionally applied.

We furthermore conclude that the trade effect of EU RTAs increases with the level of ambition in the agreement. EU custom unions (with

Turkey, San Marino, and Andorra) and single-market integration agreements (EEA, EU–Switzerland) increase trade by 111 percent on average. By contrast, no impact was found for economic partnership agreements with countries in Africa, the Pacific, and the Caribbean. This might change over time as EPA commitments start to kick in for the partner countries, but currently EPAs appear to be ineffective in stimulating additional trade. Along the same lines, earlier (1996–2010) EU FTAs increase trade by 20 percent on average, whereas post-2010 EU FTAs increase trade by 37 percent.

Among post-2010 EU FTAs we find positive trade effects for the EU–Ukraine DCFTA (65 percent), CETA (42 percent), EU–ANDEAN (37 percent), and the EU–Korea FTA (36 percent). Conversely, the 2000 EU–Mexico Global Agreement has had no statistically significant effect on trade. The current update of the EU agreement with Mexico therefore appears to be prudent trade policy. The previous EU–Mexico agreement may not have been ambitious enough to stimulate trade significantly.

While we find moderate to strong trade effects from EU RTAs, the effect associated with EU membership is far stronger. In our main regression, the effect of EU membership is four times larger than the impact from post-2010 EU FTAs, i.e. CETA-style FTAs.

A result that stands out is the trade impact of WTO membership. The average effect of GATT/WTO membership is 50 percent larger than the effect of all RTAs. Breaking down the GATT/WTO effect further suggests that large members

such as the US, China, and India have all benefitted from above-average trade effects from GATT/
WTO membership.

9.2 Trade policy conclusions

For policy purposes, we draw three principal conclusions. First, the trade impact of EU RTAs
increases with the level of ambition. In order to
justify the considerable time, effort, and public
resources put into the negotiation of EU RTAs,
the agreements should therefore have a high level
of ambition. In this report, we have treated
EU RTAs as a black box, so we do not know which
provisions stimulate trade. In the future, we
hope to be able to open the black box and analyse
trade effects by provision as well as the effects of
non-tariff barriers. Another blind spot in the
analysis that we hope to be able to return to is the
effect of EU RTAs on trade in services.

Secondly, the analysis is relevant for countries
that are faced with an EU integration choice.
Currently, a discussion regarding the level of
EU integration is taking place in the UK and
Switzerland as well as between the EU and candidate countries such as Serbia, Albania, North
Macedonia, and Montenegro. According to our
results, EU membership is superior to both Norway-style (EEA) and CETA-style agreements in
promoting trade. Ultimately, welfare gains from
economic integration depend on trade effects,
and this report suggests that EU integration has
been highly successful in stimulating trade.

Finally, our analysis shows that it is not in the
interest of WTO members to reduce their commitment to the multilateral trading system. On
average, the WTO has had stronger trade effects
than RTAs, particularly for large and influential
members such as the US, China, and India. If we
add to this the observation that the WTO affects
all combinations of bilateral flows of its 164 members simultaneously, while RTAs affect only bilateral or regional trade flows one by one, the overall performance of the WTO is clearly superior to
a purely bilateral trade strategy.

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Notes

1   All RTAs must be notified to the WTO under either GATT article XXIV, GATS article V or the Enabling Clause (or a combination of the three). RTAs notified under GATT article XXIV are referred to as "free trade agreements" or "customs unions". Agreements notified under GATS are referred to as "economic integration agreements", and agreements notified under the Enabling Clause are referred to as "partial scope agreements". For a discussion of terminology with respect to different categories of RTAs, see pp. 7-8 in Kommerskollegium (2018).

2   Recently, the Commission has begun to make ex-post evaluations of EU RTAs, two of which have so far been published: the report on the 2011 EU-Korea FTA and the 2000 EU-Mexico Global Agreement. See https://ec. europa.eu/trade/policy/policy-making/analysis/ policy-evaluation/ex-post-evaluations/#_evaluations for further information. We report gravity estimates of these two evaluations in Section 2.

3   In theory, it is possible to imagine situations where a trade agreement reduces bilateral trade between the parties, while increasing societal welfare. For instance, if two countries apply massive export subsidies in order to increase the export of goods to each other, and then agree to limit those export subsidies in the context of an RTA, that could enhance welfare via reduced trade. In that case, the original higher level of trade between the two parties would be suboptimal from a resource allocation perspective.

4   The European Commission (2017, prepared by ECORYS) has also published an ex-post evaluation of the 2000 EU-Mexico Agreement. According to that analysis the EU-Mexico agreement has not generated additional trade. Because the gravity approach in that report departs substantially from other gravity studies discussed here, we do not include it in the literature review.

5   For a review of recent developments in the gravity literature, see Ayman and Nechi (2019), Larch et al. (2019), and Yotov et al. (2016).

6   Baier and Bergstrand (2007) marks a beginning with respect to applied papers.

7   See Ayman and Nechi (2019) for a recent update on available estimators.

8   In order to limit the presentation, we do not discuss ratio models, matching techniques, etc. For an overview of the entire battery of estimation techniques, see e.g. Head and Mayer (2014), Ayman and Nechi (2019), and Yotov et al. (2016).

9   Using deflated trade flows does not alter the main results. Estimations are available upon request.

10   The 16 agreements that have been excluded for various reasons are: six agreements with Chinese Taipei as one partner (because there are no trade data in the Comtrade database for Chinese Taipei), the 2016 agreement between Brazil and Argentina notified under the Enabling clause (because it might bias the MERCOSUR estimate), the so-called GUAM agreement among Georgia, Ukraine, Azerbaijan, and Moldova (because it was considered unrelated to trade), the EU—Syria agreement from 1977 (because it properly belongs in the WTO's preferential agreement database), the Commonwealth of Independent States (CIS) in 1994 (because we used the 2012 CIS FTA that has trade provisions instead), the 1970 agreement between the EU and its overseas countries and territories (because it overlaps significantly with other later agreements and contains very small economies), the Global System of Trade Preferences among Developing Countries (because it is part of the GSP system), the Pan-Arab Free Trade Area (because it contains a number of countries whose bilateral relations have been charac- terized by considerable geopolitical upheaval since it came into force), the 1973 Protocol on Trade Negotiations (because it is more of a framework than a trade agreement), the 1992 Economic Cooperation Agreement among Iran, Pakistan, and Turkey (because of its limited trade policy significance), and the Turkey—Syria FTA from 2007 (because of the geopolitical upheaval between the two countries during most of its existence).

11   Trade growth in relation to GDP growth (i.e. trade elasticity) is still moderate in terms of constant prices, however, which has sparked discussions about a global trade slow-down.

12   Note that not all agreements have an after period of five or ten years. Agreements that do not have a full pre-RTA and/or post-RTA period are not included when the average trade growth is calculated.

13 "EU15" is used here as the EU had 15 member states in 2000.

14 "EU27" is used as the EU had 27 member states in 2011.

15 See Table 3 in Kommerskollegium (2018) for an overview of recent studies.

16 The figures used to calculate the respective change were drawn from the World Bank database and its indicators for trade in services as a share of GDP and merchandise trade as a share of GDP.

17 Since accession, real income has converged in the new member states. Average GDP per capita among the 13 new member states that acceded from 2007 through 2013 was 76 percent of the EU average in 2018 compared to 66 percent in 2007. Source: Eurostat

18 This latter category contains the seven EU-EFTA FTAs that were in force between 1973 and 1994, three of which are still in force according to the WTO RTA database: the agreements with the three non-EU members Norway, Switzerland and Iceland.

19 Since this estimation is non-standard we recommend a careful interpretation of the estimate.

20 Finland was only an associate member of EFTA when it entered into a free trade agreement with the EU in 1973. It became a full EFTA member in 1986.

21 See Annex B, table B.9 for estimation results of individual EFTA countries.

22 In some cases the before/after period is four years instead of five years. This is indicated in the table.

23 Dash (-) indicates that an agreement does not have an after-period of ten years; dots (...) indicate missing data.

Annex A—Results from Section 5

For each country or country group, we have calculated the percentage change in export and import over a period before, as well as after, the agreement entered into force. Where possible (enough years), we have looked at periods of both five[22] and ten years "pre-RTA" and "post-RTA".[23] Given that we have data up to 2017, trade agreements that entered into force in 2015 and later are not part of the table below.

The EU variable consists of the EU member states that were members of the European Union at the time the agreement entered into force, or where becoming an EU member one year after. This means that the number of countries in our EU variable varies over time, from EU12 for the earliest agreement to EU28 for the most recent agreements.

In the tables below showing the development in EU exports and EU imports, the agreements are organised according to our classification (see Section 4.3 in the report) of RTAs pursuant to depth and scope. Category 1 consists of EU economic partnership agreements, category 2 of EU FTAs enacted before 2010 ("first-generation" FTAs), category 3 of EU FTAs enacted after 2010 ("new-generation" FTAs and DCFTAs), and category 4, EU customs unions and single-market integration agreements.

Table 3. EU Exports to Partner Countries

Agreement	Years	Total growth rate		Average annual growth rate	
		Pre-RTA	Post-RTA	Pre-RTA	Post-RTA
CATEGORY 1					
EU—Cariforum (2009; EU27)	5 years	72,9	3,9	11,9	1,7
	10 years	186,0	...	12,7	...
EU—Papua New Guinea (2010; EU27)	5 years	...	...	...	...
	10 years	...	...	...	...
EU—ESA (2012; EU28)	5 years	25,4	-18,1	5,7	-1,0
	10 years	134,3	...	9,9	...
EU—Cameroon (2014; EU28)	4 years	26,2	58,8	6,5	21,0
	10 years	144,1	-	10,7	-
EU—Fiji (2014; EU28)	4 years	1386,1	-83,1	223,7	-33,1
	10 years	1918,7	-	98,3	-

Agreement	Years	Total growth rate		Average annual growth rate	
		Pre-RTA	Post-RTA	Pre-RTA	Post-RTA
CATEGORY 2					
EU—Palestine (1997; EU15)	5 years 10 years	... ...	... ...	... ...	... ...
EU—Tunisia (1998; EU15)	5 years 10 years	23,0 172,9	15,4 106,4	4,6 11,2	3,1 7,9
EU—South Africa (2000; EU15)	5 years 10 years	5,1 ...	82,4 88,2	1,6 ...	13,7 7,7
EU—Morocco (2000; EU15)	5 years 10 years	61,0 105,7	49,2 152,4	12,3 8,9	9,0 11,0
EU—Israel (2000; EU15)	5 years 10 years	86,5 279,6	5,7 16,0	13,4 14,7	1,4 1,8
EU—Mexico (2001; EU15)	5 years 10 years	119,4 198,2	68,0 109,1	17,3 12,8	11,1 8,8
EU—North Macedonia (2001; EU15)	5 years 10 years	16,1 ...	46,2 165,0	3,2 ...	8,6 11,2
EU—Croatia (2002; EU15)	5 years 10 years	13,0 ...	106,1 99,1	3,3 ...	15,9 8,8
EU—Jordan (2002; EU15)	5 years 10 years	... 69,6	79,4 147,3	... 7,5	13,4 10,3
EU—Chile (2003; EU25)	5 years 10 years	-23,9 48,4	107,6 250,5	-4,6 5,1	16,4 14,2
EU—Egypt (2003; EU25)	5 years 10 years	-32,1 -0,1	69,0 456,3	-6,5 0,8	12,6 23,3
EU—Lebanon (2003; EU25)	5 years 10 years	-20,9 ...	47,8 169,7	-4,2 	8,6 10,9
EU—Algeria (2005; EU25)	5 years 10 years	89,5 	101,5 187,4	13,9 6,3	16,1 11,8
EU—Albania (2007; EU27)	5 years 10 years	48,0 98,2	118,3 84,4	8,6 8,7	19,1 8,2
EU—Bosnia & Herzegovina (2008; EU27)	5 years 10 years	... ...	1,0 14,4	... ...	2,2 2,6
EU—Montenegro (2008; EU27)	5 years 10 years	... ...	-31,1 -16,4	... ...	-3,8 0,9
EU—Serbia (2010; EU27)	5 years 10 years	... ...	36,7 -	... ...	6,7 -
CATEGORY 3					
EU—Korea (2011; EU27)	5 years 10 years	41,1 146,1	47,4 -	8,3 10,2	8,6 -
EU—Andean (2013; EU28)	5 years 10 years	91,1 325,6	-4,9 -	15,5 16,5	-0,5 -
EU—Central America (2013; EU28)	5 years 10 years	-1,1 84,6	22,8 -	1,7 7,5	4,6 -
EU—Georgia (2014; EU28)	4 years 10 years	69,7 417,8	-3,0 -	15,3 19,9	-0,5 -
EU—Moldavia (2014; EU28)	4 years 10 years	73,7 289,7	-3,4 -	15,4 16,6	0,5 -
CATEGORY 4					
EU—Andorra (1991; EU12)	5 years 10 years	... ...	... ...	... ...	... ...
EEA (1994; EU15)	5 years 10 years	-0,1 70,2	58,4 67,1	0,6 6,3	10,0 5,7
EU—Turkey (1996; EU15)	5 years 10 years	70,4 298,9	56,9 169,4	14,2 17,0	10,7 12,7
EU—Faroe Islands (1997; EU15)	5 years 10 years	24,6 2,0	15,4 84,0	-4,5 -3,3	3,4 7,5
EU—San Marino (2002; EU15)	5 years 10 years	... ...	... ...	... ...	... ...
EU—Switzerland (2002; EU15)	5 years 10 years	3,4 25,7	67,9 140,7	0,8 2,6	11,0 9,7

Table 4. EU Imports from Partner Countries

Agreement	Years	Total growth rate Pre-RTA	Total growth rate Post-RTA	Average annual growth rate Pre-RTA	Average annual growth rate Post-RTA
CATEGORY 1					
EU—Cariforum (2009; EU27)	5 years	164,4	-30,2	23,0	-4,6
	10 years	263,8	-	14,9	-
EU—Papua New Guinea (2010; EU27)	5 years	41,1	50,4	9,4	11,3
	10 years	54,2	-	7,5	-
EU—ESA (2012; EU28)	5 years	6,1	-6,7	2,0	-0,8
	10 years	15,8	-	1,9	-
EU—Cameroon (2014; EU28)	4 years	26,6	-28,1	6,8	-6,7
	10 years	60,9	-	6,5	-
EU—Fiji (2014; EU28)	4 years	-17,0	-0,4	15,8	5,9
	10 years	-16,9	-	7,1	-
CATEGORY 2					
EU—Palestine (1997; EU15)	5 years	...	...	...	...
	10 years	...	...	...	...
EU—Tunisia (1998; EU15)	5 years	44,3	24,9	8,2	4,6
	10 years	158,2	163,9	10,5	10,5
EU—South Africa (2000; EU15)	5 years	64,5	86,8	10,6	14,0
	10 years	59,6	140,1	5,2	10,4
EU—Morocco (2000; EU15)	5 years	27,7	50,0	5,2	8,7
	10 years	89,3	70,4	7,1	6,3
EU—Israel (2000; EU15)	5 years	24,5	55,6	4,7	9,3
	10 years	165,9	90,4	10,7	6,9
EU—Mexico (2001; EU15)	5 years	63,3	76,2	11,1	12,9
	10 years	69,7	175,4	6,6	12,4
EU—North Macedonia (2001; EU15)	5 years	-9,0	66,4	-0,4	13,0
	10 years	...	163,6	...	13,3
EU—Croatia (2002; EU15)	5 years	-4,4	86,2	-0,7	14,2
	10 years	...	143,6	...	10,1
EU—Jordan (2002; EU15)	5 years	-44,0	122,4	-10,5	19,3
	10 years	19,9	185,2	3,5	14,7
EU—Chile (2003; EU25)	5 years	16,2	278,8	3,6	32,0
	10 years	34,4	172,8	4,2	14,2
EU—Egypt (2003; EU25)	5 years	-1,3	214,2	0,7	26,8
	10 years	-5,3	255,9	0,5	16,2
EU—Lebanon (2003; EU25)	5 years	0,3	135,3	0,8	19,6
	10 years	45,9	164,4	4,6	12,5
EU—Algeria (2005; EU25)	5 years	123,4	67,1	20,7	13,5
	10 years	107,3	170,1	10,1	12,3
EU—Albania (2007; EU27)	5 years	96,2	115,8	14,9	17,6
	10 years	143,1	96,6	10,1	8,3
EU—Bosnia & Herzegovina (2008; EU27)	5 years	258,4	17,1	29,4	5,4
	10 years	935,9	54,8	26,9	5,9
EU—Montenegro (2008; EU27)	5 years	...	-30,4	...	-0,8
	10 years	...	-58,6	...	-2,5
EU—Serbia (2010; EU27)	5 years	...	98,7	...	15,8
	10 years	...	-	...	-

Agreement	Years	Total growth rate		Average annual growth rate	
		Pre-RTA	Post-RTA	Pre-RTA	Post-RTA
CATEGORY 3					
EU—Korea (2011; EU27)	5 years	18,7	-12,4	4,6	-2,4
	10 years	110,8	-	9,2	-
EU—Andean (2013; EU28)	5 years	61,5	-25,3	12,7	-5,0
	10 years	387,1	-	18,7	-
EU—Central America (2013; EU28)	5 years	36,3	-24,2	7,3	-4,2
	10 years	186,8	-	12,0	-
EU—Georgia (2014; EU28)	4 years	50,7	-9,8	13,2	-0,8
	10 years	182,7	-	14,6	-
EU—Moldavia (2014; EU28)	4 years	70,3	43,0	15,9	10,3
	10 years	189,8	-	15,2	-
CATEGORY 4					
EU—Andorra (1991; EU12)	5 years	142,2	9,9	20,2	5,1
	10 years	88,1	-11,3	23,4	0,5
EEA (1994; EU15)	5 years	35,7	21,7	7,0	4,9
	10 years	93,0	81,9	7,3	7,2
EU—Turkey (1996; EU15)	5 years	47,3	37,0	8,7	6,6
	10 years	295,8	234,4	15,5	13,3
EU—Faroe Islands (1997; EU15)	5 years	-5,2	12,1	-0,3	2,7
	10 years	57,5	32,1	5,4	3,2
EU—San Marino (2002; EU15)	5 years	...	37,8	...	11,5
	10 years	...	141,9	...	25,9
EU—Switzerland (2002; EU15)	5 years	-9,7	68,9	-1,9	11,2
	10 years	16,4	147,8	1,8	9,8

Annex B—Regression tables

Table B1. Regression Results Accompanying Fig. 8

	OLS without intra-national trade	OLS with intra-national trade	PPML without intra-national trade	PPML with intra-national trade
EU-membership	0.659***	0.673***	0.322***	0.908***
	(15.42)	(15.84)	(8.29)	(19.97)
WTO-membership	0.0911***	0.120***	0.114**	0.511***
	(2.92)	(3.90)	(2.57)	(13.76)
EU RTAs	0.144***	0.153***	-0.00485	0.392***
	(5.59)	(5.98)	(-0.17)	(11.40)
non-EU RTAs	0.347***	0.352***	-0.0126	0.310***
	(8.84)	(9.00)	(-0.23)	(3.45)
Constant	6.909***	6.930***	16.00***	19.08***
	(413.23)	(422.08)	(384.62)	(1343.23)
N	863871	867425	863899	867453
No. of fixed effects	41467	41599	41467	41599

Table B2. Regression Results Accompanying Fig. 9

	OLS without intra-national trade	OLS with intra-national trade	PPML without intra-national trade	PPML with intra-national trade
WTO membership	0.0858***	0.116***	0.117***	0.541***
	(2.75)	(3.77)	(2.66)	(14.32)
EU RTAs	0.108***	0.112***	-0.0620**	0.161***
	(4.17)	(4.36)	(-2.00)	(3.39)
non-EU RTAs	0.350***	0.355***	-0.0139	0.283***
	(8.90)	(9.05)	(-0.26)	(3.09)
eu_exp1973	0.849***	0.725***	1.067***	0.607***
	(4.54)	(3.50)	(9.07)	(2.92)
eu_exp1981	-0.00278	-0.0688	0.0250	0.125
	(-0.02)	(-0.40)	(0.12)	(0.62)
eu_exp1986	0.530***	0.449***	0.687***	0.741***
	(5.62)	(4.04)	(6.69)	(4.01)
eu_exp1995	0.614***	0.592***	0.0671	0.260**
	(7.35)	(7.03)	(1.03)	(2.13)
eu_exp2004	0.531***	0.502***	0.175***	0.734***
	(7.54)	(7.02)	(3.64)	(5.39)
eu_exp2007	0.680***	0.660***	0.366***	0.575***
	(6.27)	(6.00)	(4.45)	(5.65)
eu_exp2013	0.711***	0.705***	0.370***	0.786***
	(4.65)	(4.61)	(3.02)	(5.22)
Constant	6.917***	6.939***	16.00***	19.10***
	(413.50)	(422.05)	(393.44)	(1189.86)
N	863871	867425	863899	867453
No. of fixed effects	41467	41599	41467	41599

Table B3. Regression Results Accompanying Fig. 10

	OLS without intra-national trade	OLS with intra-national trade	PPML without intra-national trade	PPML with intra-national trade
EU-membership	0.659*** (15.42)	0.673*** (15.84)	0.322*** (8.29)	0.908*** (19.97)
WTO-membership	0.0911*** (2.92)	0.120*** (3.90)	0.114** (2.57)	0.511*** (13.76)
EU RTAs	0.144*** (5.59)	0.153*** (5.98)	-0.00485 (-0.17)	0.392*** (11.40)
non-EU RTAs	0.347*** (8.84)	0.352*** (9.00)	-0.0126 (-0.23)	0.310*** (3.45)
Constant	6.909*** (413.23)	6.930*** (422.08)	16.00*** (384.62)	19.08*** (1343.23)
N	863871	867425	863899	867453
No. of fixed effects	41467	41599	41467	41599

Table B4. Regression Results Accompanying Fig. 11

	PPML with intra-national trade	PPML with intra-national trade (dynamics)
EU-membership	0.908*** (19.97)	0.630*** (14.12)
WTO-membership	0.511*** (13.76)	0.500*** (13.67)
EU RTAs	0.392*** (11.40)	0.294*** (9.03)
non-EU RTAs	0.310*** (3.45)	0.317*** (3.53)
F5_eu		-0.139*** (-4.50)
L5_eu		0.261*** (10.96)
L10_eu		0.316*** (12.01)
F5_eu_all		-0.0144 (-0.59)
L5_eu_all		0.168*** (8.54)
L10_eu_all		0.130*** (5.93)
Constant	19.08*** (1343.23)	19.08*** (1302.33)
N	867453	867453
No. of fixed effects	41599	41599

Table B5. Regression Results Accompanying Fig. 12

	PPML with intra-national trade	PPML with intra-national trade (trade-weighted)
EU-membership	0.908*** (19.97)	0.913*** (21.94)
WTO-membership	0.511*** (13.76)	0.471*** (13.70)
EU RTAs	0.392*** (11.40)	0.446*** (10.86)
non-EU RTAs	0.310*** (3.45)	0.678*** (8.26)
Constant	19.08*** (1343.23)	22.19*** (85537.19)
N	867453	867425
No. of fixed effects	41599	41599

Table B6. Regression Results Accompanying Fig. 13a

	PPML with intra-national trade	PPML without intra-national trade	OLS with intra-national trade	OLS without intra-national trade
EU-membership	0.904*** (19.74)	0.319*** (7.98)	0.683*** (15.88)	0.669*** (15.45)
WTO-membership	0.508*** (13.64)	0.114** (2.57)	0.122*** (3.97)	0.0932*** (2.99)
non-EU RTAs	0.317*** (3.54)	-0.0114 (-0.21)	0.356*** (9.11)	0.351*** (8.95)
EPAs	0.0518 (0.74)	-0.169*** (-2.91)	0.0941* (1.94)	0.0887* (1.83)
Pre-2010 FTAs	0.359*** (9.59)	-0.0133 (-0.42)	0.176*** (5.00)	0.166*** (4.70)
Post-2010 FTAs	0.311*** (5.36)	0.0339 (0.56)	-0.0306 (-0.63)	-0.0413 (-0.85)
CUs and single market	0.746*** (11.40)	0.0187 (0.29)	0.412*** (6.21)	0.393*** (5.93)
Constant	19.08*** (1333.45)	16.00*** (384.02)	6.928*** (421.83)	6.907*** (413.02)
N	867453	863899	867425	863871
No. of fixed effects	41599	41467	41599	41467

Table B7. Regression Results Accompanying Fig. 13b

	PPML with intra-national trade	PPML without intra-national trade
EU-membership	0.966***	0.391***
	(21.25)	(9.51)
WTO-membership	0.513***	0.121***
	(13.75)	(2.71)
non-EU RTAs	0.318***	-0.00822
	(3.55)	(-0.15)
EPAs	-0.000178	-0.212***
	(-0.00)	(-3.69)
1996-2010 EU FTAs	0.179***	-0.167***
	(3.70)	(-4.05)
1973 EU-EFTA agreements	0.532***	0.150***
	(11.18)	(3.56)
Post-2010 EU FTAs	0.312***	0.0358
	(5.37)	(0.59)
CUs and single market integration	0.864***	0.128**
	(12.52)	(2.02)
Constant	19.08***	15.97***
	(1322.35)	(380.73)
N	867453	863899
No. of fixed effects	41599	41467

Table B8. Regression Results Accompanying Fig. 14

	PPML with intra-national trade
EU-membership	0.625***
	(13.59)
WTO-membership	0.497***
	(13.51)
non-EU RTAs	0.323***
	(3.60)
F5_eu	-0.142***
	(-4.62)
L5_eu	0.260***
	(11.14)
L10_eu	0.299***
	(11.08)
EPAs	0.00340
	(0.05)
Pre-2010 FTAs	0.273***
	(7.48)
Post-2010 FTAs	0.347***
	(6.26)
CUs and single market	0.482***
	(9.53)
F5_EPAs	-0.0864
	(-1.58)
F5_Pre-2010 FTAs	-0.0544**
	(-1.96)
F5_Post-2010 FTAs	0.166***
	(4.60)
F5_CUs and single market	0.0545
	(1.63)
L5_EPAs	-0.0237
	(-0.26)
L10_EPAs	0
	(.)
L5_Pre-2010 FTAs	0.162***
	(7.68)
L10_Pre-2010 FTAs	0.0816***
	(3.73)
L5_Post-2010 FTAs	0.178***
	(3.54)
L10_Post-2010 FTAs	0
	(.)
L5_CUs and single market	0.252***
	(7.23)
L10_CUs and single market	0.147***
	(4.23)
Constant	19.08***
	(1290.53)
N	867453
No. of fixed effects	41599

Table B9. Regression Results Accompanying Fig. 15

	PPML with intra-national trade		PPML with intra-national trade
EU-membership	0.979***	eu_centralamerica	0.0666
	(20.36)		(0.87)
WTO-membership	0.514***	eu_eea	0.902***
	(13.68)		(5.95)
non-EU RTAs	0.316***	eu_che02	0.650***
	(3.47)		(4.49)
eu_cariforum	-0.0992	eu_fro	-0.276
	(-0.91)		(-1.15)
eu_pacific	-0.274	eu_tr	0.912***
	(-1.42)		(8.89)
eu_esa	-0.0372	eu_and	0.905***
	(-0.31)		(2.62)
eu_gh	-0.172	eu_smr	0.286
	(-0.97)		(0.91)
eu_ci	-0.0316	Constant	19.08***
	(-0.25)		(1302.60)
eu_cm	-0.432***	N	867453
	(-3.01)	No. of fixed effects	41599
eu_sadc	0.0164		
	(0.14)		
eu_chl	0.226**		
	(2.01)		
eu_mex	0.242		
	(1.41)		
eu_za	-0.0241		
	(-0.33)		
eu_euromed	0.211***		
	(3.17)		
eu_balkan	0.281***		
	(5.66)		
eu_is	0.503***		
	(2.66)		
eu_no	0.396***		
	(4.00)		
eu_swe73	0.627***		
	(8.74)		
eu_fin	0.674***		
	(8.78)		
eu_aut	0.480***		
	(6.20)		
eu_prt	0.306**		
	(2.47)		
eu_che73	0.349***		
	(2.90)		
eu_kr	0.308***		
	(3.61)		
eu_ca	0.348***		
	(2.62)		
eu_ua	0.501***		
	(4.37)		
eu_gemd	0.375**		
	(2.42)		
eu_andean	0.316***		
	(4.39)		

Table B10. Regression Results Accompanying Fig. 16

	PPML with intra-national trade	PPML with intra-national trade (dynamics)	PPML with intra-national trade (no GATT/WTO and EU included in RTA-variable)
EU-membership	0.884*** (17.55)	0.899*** (18.17)	
WTO-membership	0.509*** (13.54)	0.503*** (13.41)	
RTAs	0.336*** (4.99)	0.264*** (6.16)	
F5_rta		0.0812*** (4.42)	
L5_rta		0.0594* (1.90)	
L10_rta		0.0733* (1.86)	
F5_rta_with_eu			0.0427* (1.71)
rta_with_eu			0.347*** (8.60)
L5_rta_with_eu			0.139*** (5.30)
L10_rta_with_eu			0.228*** (7.49)
Constant	19.09*** (1239.87)	19.08*** (1212.04)	19.23*** (1676.81)
N	867453	867453	867453
No. of fixed effects	41599	41599	41599

Table B11. Regression Results Accompanying Fig. 17

	Average effect of WTO	Dynamic WTO-effect	swe	fin	dnk	nor	chn	usa	gbr	deu	ind	bra	ita	ken	jpn	eu28
			WTO-effect for country:													
EU	0.908*** (1.97)	0.831*** (18.51)	0.916*** (20.47)	0.912*** (20.07)	0.908*** (19.96)	0.908*** (19.95)	0.913*** (20.01)	0.922*** (20.36)	0.909*** (19.98)	0.914*** (20.16)	0.910*** (19.99)	0.908*** (19.97)	0.907*** (19.95)	0.908*** (19.97)	0.907*** (19.97)	0.909*** (20.01)
WTO	0.511*** (13.76)	0.348*** (8.88)														
EU RTAs	0.392*** (11.40)	0.357*** (10.77)	0.386*** (11.41)	0.389*** (11.36)	0.392*** (11.40)	0.390*** (11.35)	0.393*** (11.44)	0.398*** (11.80)	0.390*** (11.29)	0.391*** (11.41)	0.392*** (11.42)	0.391*** (11.40)	0.393*** (11.43)	0.391*** (11.40)	0.391*** (11.39)	0.392*** (11.38)
non-EU RTAs	0.310*** (3.45)	0.254*** (3.29)	0.310*** (3.45)	0.310*** (3.45)	0.310*** (3.45)	0.310*** (3.45)	0.306*** (3.35)	0.305*** (3.57)	0.312*** (3.48)	0.306*** (3.41)	0.309*** (3.43)	0.310*** (3.45)	0.308*** (3.43)	0.310*** (3.45)	0.309*** (3.44)	0.308*** (3.49)
F5_gattwto		-0.0365 (-1.30)														
L5_gattwto		0.153*** (6.66)														
L10_gattwto		0.142*** (4.88)														
WTO (cty i)			0.261*** (2.72)	0.242*** (2.83)	0.409*** (5.21)	0.268* (1.92)	0.582*** (7.68)	0.682*** (20.51)	0.663*** (7.47)	0.464*** (10.72)	1.074*** (8.13)	0.476** (2.54)	0.296*** (4.42)	0.341* (1.82)	0.459*** (12.20)	0.503*** (10.78)
_cons	19.08*** (1343.23)	19.08*** (1325.98)	19.59*** (745.65)	19.60*** (745.96)	19.59*** (738.20)	19.60*** (739.89)	19.47*** (804.20)	19.42*** (804.55)	19.56*** (760.14)	19.56*** (663.63)	19.57*** (756.05)	19.58*** (752.65)	19.59*** (778.00)	19.60*** (739.76)	19.53*** (802.65)	19.44*** (780.84)
N	867453	867453	867453	867453	867453	867453	867453	867453	867453	867453	867453	867453	867453	867453	867453	867453
No. of FEs	41599	41599	41599	41599	41599	41599	41599	41599	41599	41599	41599	41599	41599	41599	41599	41599

Table B12. Regression Results Not Presented in Figures

	New gold standard (EMU & Schengen)	New gold standard (EU dynamics)	Old gold standard (EU dynamics)
EU-membership	0.809*** (16.29)	0.693*** (16.04)	0.422*** (11.37)
WTO	0.486*** (13.20)	0.503*** (13.74)	0.0927*** (2.97)
EU RTAs	0.410*** (11.63)	0.429*** (12.11)	0.130*** (4.97)
non-EU RTAs	0.314*** (3.50)	0.311*** (3.46)	0.345*** (8.79)
EMU	0.122*** (2.73)		
Schengen	0.130*** (2.63)		
F5_eu		-0.132*** (-4.43)	0.321*** (10.68)
L5_eu		0.205*** (8.76)	0.106*** (3.76)
L10_eu		0.269*** (10.82)	0.0951*** (2.71)
_cons	19.09*** (1367.79)	19.08*** (1325.36)	6.906*** (412.67)
N	867453	867453	863871
No. of fixed effects	41599	41599	41467

Sammanfattning

Handelseffekter av EU:s regionala handelsavtal

Efter att förhandlingarna inom ramen för den s.k. Doharundan i Världshandelsorganisationen (WTO) avstannade 2008 har EU:s ansträngningar för att liberalisera handeln fokuserat alltmer på regionala handelsavtal.* Som en konsekvens har intresset ökat för hur effektiva dessa avtal är när det gäller att stimulera handel. Ett ytterligare motiv för denna rapport utgår från iakttagelsen att nästan alla positiva välståndseffekter kopplade till handelsavtal förutsätter mer ekonomisk integration och internationell arbetsdelning, dvs handel. Mot bakgrund av dessa överväganden är syftet med rapporten att analysera effekterna av EU:s regionala handelsavtal på varuhandeln. Analysens fokus ligger på hur handeln mellan parterna påverkas. Den berör inte effekter på länder utanför avtalet.

Utredningens resultat

Enligt vår huvudmodell stimulerar EU:s regionala handelsavtal handeln mellan EU och partnerländerna med 48 procent i genomsnitt.

Kollegiets analys visar vidare att EU:s regionala handelsavtal har betydande infasningseffekter. Tio år efter ikraftträdandet av ett avtal är den uppskattade effekten 65 procent. Vi hittar däremot inget stöd för förväntanseffekter av EUs regionala handelsavtal, dvs. effekter som uppstår redan innan ett avtal träder i kraft.

Handelseffekten av EU:s regionala handelsavtal ökar med ambitionsnivån i avtalet. EU:s tullunio-

ner (med Turkiet, San Marino och Andorra) och avtal som syftar till inre marknadsintegration (EES-avtalet med Norge och Island, samt avtalen mellan EU och Schweiz) ökar i genomsnitt handeln med 111 procent. Däremot fann kollegiet inga handelseffekter av de ekonomiska partnerskapsavtal som EU har tecknat med länder i Afrika, Stilla havet och Karibien. Tidigare frihandelsavtal (1996–2010) har ökat handeln med i genomsnitt med 20 procent, medan EU:s frihandelsavtal efter 2010 har stimulerat handeln med 37 procent.

Bland individuella frihandelsavtal som trätt i kraft efter 2010 finner vi positiva handelseffekter för avtalen mellan EU och Ukraina — DCFTA (65 procent), EU och Kanada — CETA (42 procent), EU och Colombia, Ecuador och Peru — ANDEAN (37 procent) samt mellan EU och Korea (36 procent). Enligt kollegiets beräkningar har däremot avtalet mellan EU och Mexiko från 2000 inte haft någon statistiskt signifikant effekt på handeln. Den nuvarande uppdateringen av avtalet med Mexiko framstår mot den bakgrunden som lämplig.

Medan kollegiet finner måttliga till starka handelseffekter av EU:s olika regionala handelsavtal, är effekten av EU-medlemskapet i sig betydligt starkare. Enligt vår huvudmodell är effekten av EU-medlemskap fyra gånger starkare än effekterna av EU:s frihandelsavtal efter 2010, dvs. frihandelsavtal av CETA-typ.

Ett resultat som sticker ut är handelseffekterna av WTO. Den genomsnittliga effekten av att vara medlem i WTO är 50 procent större än den genomsnittliga effekten av alla frihandelsavtal. När vi bryter ned WTO-effekten per land visar den

vidare att stora WTO-medlemmar som USA, Kina och Indien alla har gynnats mer än genomsnittet av sitt medlemskap.

Handelspolitiska slutsatser

Handelseffekterna av EU:s regionala handelsavtal ökar med ambitionsnivån. För att motivera den betydande tid, ansträngning och offentliga resurser som läggs på förhandlingar, bör de därför ha en hög ambitionsnivå.

Analysen är vidare relevant för länder som står inför ett vägval när det gäller EU-integration. För närvarande pågår en diskussion om nivån på EU-integration i Storbritannien och Schweiz samt mellan EU och kandidatländer som Serbien, Albanien, Nordmakedonien och Montenegro. Enligt våra beräkningar är medlemskap i EU överlägset både avtal av Norge- (EEA) och CETA-typ när det gäller att stimulera handel. I slutändan förutsätter positiva välståndseffekter av ekonomisk integration ökad handel, och denna rapport visar att EU-integrationen har varit mycket framgångsrik när det gäller att stimulera handeln.

Slutligen pekar rapporten på att det inte ligger i WTO-ländernas intresse att minska sitt stöd för det multilaterala handelssystemet. I genomsnitt har WTO haft starkare handelseffekter än regionala handelsavtal, och effekten är särskilt stor för inflytelserika medlemsländer som USA, Kina och Indien. Om vi till detta lägger iakttagelsen att

WTO stimulerar alla kombinationer av handelsflöden för sina 164 medlemmar samtidigt, medan regionala handelsavtal påverkar bilaterala eller regionala handelsflöden en och en, är en handelspolitisk strategi som värnar WTO totalt sett överlägsen en rent bilateral strategi.

Faktaruta

Fyra grupper av regionala avtal

Idag har EU 42 olika regionala handelsavtal i kraft. För att underlätta en fördjupad analys av effekterna av olika typer av avtal gjordes en indelning i fyra kategorier.

- Ekonomiska partnerskapsavtal (EPAs) med länder i Afrika, Stilla havet och Karibien

- Frihandelsavtal som trädde i kraft före 2010 (t.ex. EU-Mexiko-avtalet från 2000)

- Frihandelsavtal som trädde i kraft efter 2010 (t.ex. EU-Korea-avtalet från 2011)

- Tullunioner och avtal som syftar till inre marknadsintegration (t.ex. EES-avtalet)

*Ofta använder Kommerskollegium "frihandelsavtal" som samlingsterm för alla typer av bilaterala och regionala handelsavtal. För att kunna analysera handelseffekter för olika avtalskategorier (frihandelsavtal, tullunioner och ännu djupare former av ekonomisk integration) har vi dock här valt att använda WTO:s samlingsterm, "regionala handelsavtal".