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# TRADE EFFECTS OF THE TRANSATLANTIC TRADE AND INVESTMENT PARTNERSHIP

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## 1. Introduction

In February 2013, President Obama announced the intention to “launch talks on a comprehensive Transatlantic Trade and Investment Partnership (TTIP) with the European Union”. This was not the first time that policymakers on either side of the Atlantic brought up the issue, given the importance of the EU-US international trade and direct investments for both partners (today making up jointly over 30% of world trade), but in the past the pronouncement was not followed by any formal negotiation. The current world economic outlook, with the rise of China and other large emerging countries, the stalemate of world trade talks within the WTO, and the consequences of the global financial crisis helped to give new relevance to the matter, and to kick-off the start of actual negotiations. By the end of 2014, seven rounds of negotiations took place, confirming the serious intention to proceed on both sides.

Nowadays, the issue looks quite different than a couple of decades ago, when the idea was initially brought up. First, the nature of barriers to transatlantic trade has changed. Both the EU and the US are in many respects very open economies, applying an average tariff to trade in goods of about 3%. In fact, some of the criticism on the current negotiations questions how much trade can be increased by the agreement, given the low tariff level. But between the two areas are still in place many frictional and regulatory barriers that hamper trade and foreign direct investments, especially in the area of services, public procurement, and other non-manufacturing sectors. These non-traditional barriers matter much more than in the past, both because the extent and scope of regulations expanded over time, and because they affect sectors that became increasingly relevant in the trade relations between the two areas. Furthermore, these barriers might directly affect the organization and extension of international production chains between the two areas. In the current negotiations, the central discussions deal with the rules on investment protection and how to manage possible investor-state disputes, on the rules

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on public procurement, and on how to find an agreement on regulations, maintaining high standards in environmental protection, consumers' protection and the like. These are issues where the experience in negotiations is more limited and in which the edge between trade policy and domestic policies is blurred, slowing down the negotiation process.

Second, in the past decade the proliferation of preferential trade agreements (PTAs) and their evolution to include provisions well beyond the simple removal of tariffs has generated a "domino" effect (Baldwin, 1993), making participation to trade agreements more relevant on the one hand, but also reducing the extent of pure preferentiality on the other. For example, the EU has in place PTAs with over thirty countries, the most recent being the trade agreements negotiated with South Korea and with Canada. TTIP would belong to this generation of new trade agreements, it has a much broader base, as it involves much larger trading partners and it will impact on a very significant volume of trade, but one can wonder how effective it can be in the current context.

In this paper, we want to assess the impact of PTAs on trade flows, and of TTIP in particular, in light of these recent evolutions. We assume in fact that the effectiveness in terms of market openness, increased competition and better allocation of resources that could generate welfare improvements, as well as adjustment costs for the economies involved will need to go through a larger flow of trade and exchanges between the two areas. Therefore, the estimate of the impact of the agreement on trade flows is the first step to understand also its indirect effects. In order to do this, we estimate a gravity model, the standard framework in empirical analysis of trade patterns, to measure the expected effects of trade agreements on bilateral trade. We shape our model so to best capture the specific characteristics of TTIP. First of all, we consider the EU as a single country, neglecting the (quite possible) differentiated effects for individual European countries. This choice allows to exploit one of the key explanatory variables in the gravity model, which is the economic mass (represented by GDP) of the countries. In fact, it is precisely the large GDP of the partners involved, implying a very large potential production and export capacity, as well as a very large and rich market, that is fostering large trade flows between the two. Another specific feature of our estimates is the introduction of different degrees of "integration" or "depth" of the agreements, to go beyond the pure tariff-removal effect. We use different variables to capture the extent of the coverage of each agreement between countries, whether they cover only trade, or if they imply the removal of regulatory barriers and if rules on FDI are modified. In this specification we expect to find a stronger effect for more extensive kinds of agreements. A further contribution of the paper is to consider the differentiated impact of PTAs involving countries with similar level of development, like it

would be the case for the TTIP, and PTAs among countries with very different average income per capita.

The structure of the present paper is as follows. The next section illustrates the evidence on the role of trade agreements. Section 3 describes our methodology and provides the empirical estimation of the effects of such agreements. Section 4 concludes.

## **2. The relevance of preferential trade agreements**

There is a large literature assessing the effects of preferential trade agreements (PTA) on trade flows. The empirical work has followed two main methodologies: regressions of bilateral trade flows between countries using gravity model estimates and computable general equilibrium models. The gravity model framework has been increasingly refined to address a number of concerns on the endogeneity of the PTA dummy variable used (Baier and Bergstrand, 2004, 2007; Baier et al., 2008) and on the robustness of its conclusions (Egger and Larch, 2008). Considering a large set of works, the coefficient for the PTA variable is usually in between 0.50 and 0.70, suggesting that the PTA effect increases trade flows between member countries by about 40% (Cipollina and Salvatici, 2010). The range of results produced on the impact of PTA by different studies varies because of the differences in datasets, period of observation, countries included and estimation methods, but all estimates strongly reject the hypothesis of no effects of such agreements. Interestingly, the estimates produced for more recent observation periods tend to show higher coefficients, which can be due the increasing “depth” of the trade agreements signed in last few years.

Recent work on PTAs also suggests that not only the proliferation of trade agreements tend to produce a “domino effect” (Baldwin, 1993), pushing countries to sign new trade deals as their partners do the same (so that the number of existing PTAs worldwide has increased rapidly, passing the number of 300 agreements), but also there seem to exist spillovers between different types of preferentiality, from preferentiality in goods trade to preferentiality in service trade and in international investments (Egger and Wamser, 2013).

The new trends in PTAs are visible also in the case of the EU and the USA. Currently, the EU has over 20 free trade agreements in place, many with small less developed countries and former colonies. Notable exceptions are the agreements with the European countries not belonging to the EU (Switzerland, Norway and Iceland), with Turkey and, much more recently with South Korea. This trade agreement was signed within the recent wave of new EU activism in bilateral negotiations, and it contains a number of provisions that go well beyond tariff elimination, so that the EU Commission calls it “New Generation Free Trade Agreement”. The

USA has 14 trade agreements in force, mostly with emerging or less developed countries, and many of them recently negotiated and still in course of implementation.

Given the different characteristics of the recent PTAs, it is important to focus on the recent period in estimating their effects. The relatively short time span considered in this paper reduces the time variability of some of our variables, but it makes the results more relevant and easier to apply to the ongoing negotiations.

Up to now, the gravity model methodology has not been used directly to estimate the potential impact of the TTIP agreement, but estimates on the impact of TTIP have used computable general equilibrium (CGE) models to assess its effects. The estimates used different CGE models, therefore also in this case the results produced are slightly different. As far as bilateral trade flows are concerned, for example the work by Francois et al. (2013) using the GTAP model estimates the expected effect to be an increase of EU exports to the US between 16% and 28%, according to the extent of the liberalization, while the corresponding increase for USA export to the EU should be somewhat higher. The increase of total (as opposed to bilateral) trade flows for both areas is expected to be lower, in the order of 10% at most because of some effects of trade diversion, but still positive. The results that have been produced to estimate the impact of a Transatlantic free trade area confirm that the existing frictions are relevant. Given the low level of the starting tariffs, the estimated trade increase depends to a very large extent on the elimination of non-tariff barriers, and the alignment of laws, regulations and standards, not an easy or fast result to achieve. But a comprehensive agreement including more than pure trade measures and allowing to fully exploit the untapped trade potential between these countries could give rise to benefits in terms of trade expansion and GDP increases (see for example ECORYS (2009), Francois et al. (2013) and Fontagné et al. (2013)).

Estimates of the effects of the TTIP or any other trade agreement obtained with a CGE model rely on a large number of hypotheses on the economic systems considered. The advantage of a simpler, but more direct approach such as a gravity model, focusing specifically on the bilateral trade impact of the agreement, rests instead on its broad applicability, even if it does not consider all the possible general equilibrium effects. Theory has shown that in its general form, the gravity model can be derived from different setups and its results do not depend on the specific assumptions made on markets' structures, countries' specialization, and so on. Given the rapid changes in the economic outlook of countries in the recent past and the high uncertainty that still characterizes the specific content of the TTIP agreement, the need for few hypotheses is an important advantage.

### 3. Methodology and results

The gravity equation has been widely used to estimate the impact of free trade agreements on bilateral trade flows. This equation can be derived from many theoretical models of international trade (see Head and Mayer (2013)). The gravity equation is :

$$\ln X_{ijt} = \alpha + \beta_1 \ln D_{ij} + \beta_2 \ln Y_{it} + \beta_3 \ln Y_{jt} + Z_{ij} \chi + \delta_1 RTA_{ijt} + \delta_2 TD_{ijt} + \theta_{it} + \theta_{jt} + \theta_{ij} + \varepsilon_{ijt} \quad (1)$$

where  $X_{ijt}$  is exports from country  $i$  to country  $j$  at time  $t$ ,  $D$  is the geodesic distance measure,  $Y_{it}$  and  $Y_{jt}$  are respectively exporter and importer countries' GDP,  $Z_{ij}$  is a matrix of pair-specific time-invariant characteristics,  $RTA_{ijt}$  includes measures of trade and economic integration between country pairs,  $TD_{ijt}$  is a measure of trade diversion and  $\theta_{it}$ ,  $\theta_{jt}$  and  $\theta_{ij}$  are, respectively, exporter-year, importer-year and pair dummies.

Our model is estimated on an unbalanced panel of 148 countries from 2004 to 2011. European Union, including 25 Member States after 2004 enlargement, is considered as a single country. This choice was made to fully exploit the relevance of the EU economy and internal demand, one of the key explanatory variables in the gravity model, represented by GDP or national income of countries.

#### 3.1 Data

Data on bilateral exports of goods are retrieved from the IMF's Direction of Trade Statistics (DOTS) database from 2004 to 2011. The DOTS database reports two values for the same flow, i.e. exports from country  $i$  to country  $j$  and imports of country  $j$  from country  $i$ , as reported by the two countries. To overcome discrepancies between the two reported values, following Head et al. (2010), we consider the larger value reported, after adjusting for the fact that exports and imports are reported, respectively, in FOB and CIF prices.

The measure of distance is sourced from the CEPII GeoDist dataset (Mayer and Zignago, 2011). As we consider EU as a single country, we calculate distance between EU and partners as a weighted average of single Members' distances, using relative population as weights.

Data on exporters' and importers' GDP are obtained from World Bank's World Development Indicators.

Pair-specific time-invariant variables are extracted from the CEPII's Gravity dataset (Head et al., 2010; Head and Mayer, 2013). Standard gravity variables considered are *common language*, which takes value 1 when a language is spoken by at least 9% of the population in

both countries; *common border*, a dummy for contiguous countries; *colonial ties*, a dummy which takes value 1 for countries ever in colonial relationship; and *common currency*. These variables have been aggregated for European Union's countries, using relative population as weights.

The variables of interest are those measuring the presence and depth of preferential trade agreements between country pairs. To build our proxies we took advantage of two sources of data. Dummy variables for different types of preferential trade agreements are built according to WTO data on reported agreements. These data allow us to distinguish whether two countries have signed an agreement, the year in which it entered into force, and the type of the agreement. Thus, beyond introducing a dummy variable for those country-pairs involved in a preferential trade agreement, we distinguish them in partial scope agreements, free trade agreements and customs unions.

However, specific characteristics of a preferential trade agreement, regardless of the type, may be crucial in determining increases in trade flows between countries. For that reason, taking advantage of the dataset created by Kohl et al. (2013) that expands the one created by Orefice and Rocha (2014) we measure agreements' depth as a function of the number of provisions included, distinguishing between those which fall under the current mandate of the WTO, called *plus*, and those regarding aspects outside the current mandate of the WTO, called *extra*. The first three variables built measure the coverage of the agreement as the ratio between the number of provisions included and the maximum number of provisions, i.e. 13 for *plus* and 4 for *extra* provisions. We measure in particular the coverage of *plus* provisions,  $covplus_c$ , of *extra* provisions,  $covextra_c$ , and we add a general coverage index,  $tai_c$ , which does not distinguish between the two types of provisions.

Moreover, the database on trade agreements includes information about legal enforceability. Provisions are considered as legally enforceable, according to Horn et al. (2010), if at least some of the obligations specified are clearly defined, effectively binding the Member countries. Thus, we include additional measures of agreements' depth considering the number of legally enforceable provisions as a share of the maximum number of *plus* provisions ( $covplus_e$ ) and of *extra* provisions ( $covextra_e$ ). We include also a general depth measure,  $tai_e$ , the ratio between legally enforceable provisions and the maximum number, without distinguishing the type.

Finally, as the participation to PTAs can generate trade diversion effects, we include, with a procedure similar to Magee (2003), a trade diversion index, which reports the number of agreements the two countries in the pair considered have signed with third countries.

### 3.2 Results

The empirical analysis of international trade flows using the gravity equation is very broad, however we lack a well-defined consensus on the best estimation methodology for this model, and the debate is still open. Therefore, it is important to clarify the choice of the estimation technique to better understand the results obtained.

In this paper we estimate the coefficients of equation (1)<sup>4</sup> using the Poisson pseudo maximum likelihood estimator originally suggested by Santos Silva and Tenreyro (2006). Given the logarithmic transformation utilized in equation (1), this estimation method allows to produce estimates that are consistent even in presence of heteroschedasticity in the error term and allows for the presence of many zeros in the dependent variable (in the data utilized it is quite common to find many country pairs that do not trade among each other). Moreover, various simulation analysis show the good properties of this estimator (see Head and Mayer (2013); Egger and Staub (2015)).

Table 1 reports results from estimating the gravity equation on our sample of 148 countries, using alternative measures of PTAs. The estimated coefficients of controls show the expected sign, consistently with the literature on gravity models and regardless of the specification adopted. In particular, distance, a common proxy for transportation and trade costs, affects negatively and significantly trade flows. Moreover, economic mass of the exporter and the importer are confirmed as important determinants of export values: large countries tend to export more and exports are higher the larger the partner country.

Sharing a language can facilitate trade among countries, and we obtain, in our estimation, a positive effect, even if the estimated coefficient is not significantly different from zero in some specifications of the model. Moreover, countries with a common border, as robustly found in the literature, exhibit larger trade flows, with a positive estimated coefficient for the index variable for contiguity. Two other standard gravity variables, measuring respectively colonial ties and common currency, return to be not significantly different from zero in our sample.

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<sup>4</sup> We estimate a less general version than eq (1), with separate exporter, importer and time dummies. The omission of country pair effects is due to the fact their inclusion wipes out the effect of our RTA variables. Given the short time dimension of the panel, time variability of our RTA variables is very small.

Table 1: FTAs and trade flows

|                      | (1)                 | (2)                 | (3)                 | (4)                 | (5)                 | (6)                 | (7)                 | (8)                 |
|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Free Trade Agreement | 0.48***<br>[0.080]  | 0.46***<br>[0.081]  |                     |                     |                     |                     |                     |                     |
| Customs Union        |                     | 0.16<br>[0.162]     |                     |                     |                     |                     |                     |                     |
| covplus_c            |                     |                     | 0.47***<br>[0.095]  |                     |                     |                     |                     |                     |
| covplus_e            |                     |                     |                     | 0.55***<br>[0.108]  |                     |                     |                     |                     |
| covextra_c           |                     |                     |                     |                     | 0.53***<br>[0.105]  |                     |                     |                     |
| covextra_e           |                     |                     |                     |                     |                     | 0.67***<br>[0.128]  |                     |                     |
| tai_c                |                     |                     |                     |                     |                     |                     | 0.55***<br>[0.104]  |                     |
| tai_e                |                     |                     |                     |                     |                     |                     |                     | 0.65***<br>[0.123]  |
| Trade Diversion      | -0.00<br>[0.004]    | -0.00<br>[0.004]    | -0.00<br>[0.004]    | -0.01<br>[0.004]    | -0.01*<br>[0.004]   | -0.01*<br>[0.004]   | -0.01<br>[0.004]    | -0.01<br>[0.004]    |
| Distance             | -0.76***<br>[0.054] | -0.76***<br>[0.055] | -0.78***<br>[0.056] | -0.77***<br>[0.057] | -0.78***<br>[0.056] | -0.77***<br>[0.057] | -0.77***<br>[0.056] | -0.77***<br>[0.057] |
| GDP exporter         | 0.49***<br>[0.045]  | 0.49***<br>[0.045]  | 0.49***<br>[0.043]  | 0.49***<br>[0.044]  | 0.50***<br>[0.043]  | 0.50***<br>[0.043]  | 0.49***<br>[0.043]  | 0.49***<br>[0.043]  |
| GDP importer         | 0.62***<br>[0.053]  | 0.62***<br>[0.053]  | 0.63***<br>[0.051]  | 0.63***<br>[0.052]  | 0.64***<br>[0.052]  | 0.63***<br>[0.052]  | 0.63***<br>[0.051]  | 0.63***<br>[0.052]  |
| Common Language      | 0.11<br>[0.095]     | 0.11<br>[0.093]     | 0.17<br>[0.106]     | 0.19*<br>[0.108]    | 0.20*<br>[0.106]    | 0.19*<br>[0.106]    | 0.18*<br>[0.106]    | 0.19*<br>[0.107]    |
| Common Border        | 0.36***<br>[0.122]  | 0.36***<br>[0.122]  | 0.44***<br>[0.130]  | 0.42***<br>[0.131]  | 0.43***<br>[0.135]  | 0.44***<br>[0.135]  | 0.42***<br>[0.132]  | 0.42***<br>[0.133]  |
| Colonial ties        | -0.18<br>[0.235]    | -0.18<br>[0.231]    | -0.15<br>[0.245]    | -0.10<br>[0.247]    | -0.11<br>[0.251]    | -0.11<br>[0.248]    | -0.12<br>[0.245]    | -0.09<br>[0.246]    |
| Common Currency      | -0.33<br>[0.379]    | -0.33<br>[0.381]    | -0.34<br>[0.381]    | -0.33<br>[0.377]    | -0.32<br>[0.380]    | -0.33<br>[0.374]    | -0.32<br>[0.380]    | -0.32<br>[0.376]    |
| Constant             | -2.33***<br>[0.863] | -2.35***<br>[0.867] | -2.24**<br>[0.876]  | -2.30***<br>[0.878] | -2.21**<br>[0.889]  | -2.28**<br>[0.886]  | -2.27**<br>[0.883]  | -2.34***<br>[0.883] |
| Observations         | 146,680             | 146,680             | 146,680             | 146,680             | 146,680             | 146,680             | 146,680             | 146,680             |
| R-squared            | 0.928               | 0.928               | 0.923               | 0.923               | 0.925               | 0.925               | 0.924               | 0.924               |

Poisson pseudo maximum likelihood estimator. Robust standard errors in brackets

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

*Free Trade Agreement*: = 1 if countries have signed at least a FTA; *Customs Union*: = 1 if countries in a CU; *covplus\_c*: = number of *plus* provisions/13; *covplus\_e*: number of legally enforceable *plus* provisions/13; *covextra\_c*: number of *extra* provisions/4; *covextra\_e*: number of legally enforceable *extra* provisions; *tai\_c*:  $0.5 \times (\text{covplus}_c + \text{covextra}_c)$ ; *tai\_e*:  $0.5 \times (\text{covplus}_e + \text{covextra}_e)$

The eight specifications reported in Table 1 correspond to different measures of PTAs and depth of PTAs based on WTO and Kohl et al. (2013) data. In equation 1 we include a dummy variable taking value 1 for countries who have signed a free trade agreement or a stronger type of preferential agreement. The estimated coefficient is positive and highly significant, implying that pairs of countries included in a trade agreement tend to exchange more goods than countries without any specific pact. In column (2) we include an additional control for the presence of a

customs union, as a unrefined measure of depth of the agreements. The dummy *Free Trade Agreement* takes value 1 if countries have signed at least an FTA, while the variable *Customs Union* takes value 1 if countries are part of a customs union. While the estimated effect of participation in a FTA is still positive and significant, and with almost the same magnitude as in specification (1), the estimated effect of participation in a customs union is again positive but not statistically different from zero; thus, we find no additional significant effects of signing a stronger agreement. However, our depth measure so far is based only on the type of the agreement as reported to WTO by Member countries. In order to measure coverage and depth of the agreement more precisely, we consider the number of provisions included.

In columns (3), (4) and (5) we include our three proxies for coverage, considering respectively *plus*, *extra* and all provisions. These variables measure the effect of an additional provision included in the agreement; in all cases the estimated coefficients are positive and highly significant, implying a strong relationship between the coverage of the agreement and trade flows among participants. The effect is stronger when considering provisions outside the current mandate of WTO.

Finally, we restrict to legally enforceable provisions to build a more refined measure of agreements' depth. In columns (6), (7) and (8) we report positive and significant estimated coefficients when considering, respectively, *plus*, *extra* and all provisions. These results confirm that countries with deeper agreements tend to export more. It is also important to note that the magnitude of the estimated coefficients is larger compared to the specifications including simpler measures of coverage that do not consider legal enforceability. So the inclusion of stipulations that are binding for signatory countries results to be relevant, and the effect is stronger for those provisions under the mandate of WTO.

In all the equations reported in Table 1, we also include a measure of trade diversion, which considers the number of agreements in force between the countries in the pair considered and third parties. The estimated coefficient is negative, but slightly significant only in two of the eight specifications.

The extensive empirical literature on gravity models has shown quite large heterogeneity of results across studies and it has been shown that they may be sensitive to the sample used or the time-span considered. While we are constrained in the period of time considered by the choice of including EU as a single country, we test robustness of our results considering different samples.

First, we investigate whether the impact of trade agreements differs when partner countries are both developed or the agreement is between a developed and a developing country.

Table 2: Impact of trade agreements with developed and developing countries

|                 | North-North         |                     | North-South         |                     |
|-----------------|---------------------|---------------------|---------------------|---------------------|
|                 | (1)                 | (2)                 | (5)                 | (6)                 |
| tai_c           | 0.49***<br>[0.121]  |                     | 0.67***<br>[0.135]  |                     |
| tai_e           |                     | 0.59***<br>[0.142]  |                     | 0.69***<br>[0.175]  |
| Trade diversion | -0.00<br>[0.004]    | -0.00<br>[0.004]    | -0.01<br>[0.008]    | -0.01<br>[0.008]    |
| Distance        | -0.80***<br>[0.088] | -0.79***<br>[0.089] | -0.96***<br>[0.068] | -0.96***<br>[0.068] |
| GDP exporter    | 0.43***<br>[0.062]  | 0.43***<br>[0.063]  | 0.61***<br>[0.118]  | 0.60***<br>[0.118]  |
| GDP importer    | 0.57***<br>[0.060]  | 0.57***<br>[0.060]  | 0.49***<br>[0.142]  | 0.48***<br>[0.142]  |
| Language        | 0.11<br>[0.169]     | 0.11<br>[0.167]     | 0.29**<br>[0.115]   | 0.31***<br>[0.119]  |
| Contiguity      | 0.56***<br>[0.171]  | 0.56***<br>[0.169]  | 0.62***<br>[0.163]  | 0.61***<br>[0.169]  |
| Colonial ties   | -0.52<br>[0.329]    | -0.49<br>[0.330]    | 1.21***<br>[0.210]  | 1.24***<br>[0.215]  |
| Currency        | -1.09***<br>[0.380] | -1.08***<br>[0.379] | 0.09<br>[0.189]     | 0.05<br>[0.189]     |
| Constant        | 1.22<br>[0.968]     | 1.20<br>[0.970]     | -0.36<br>[1.623]    | -0.14<br>[1.626]    |
| Observations    | 28,616              | 28,616              | 36,744              | 36,744              |
| R-squared       | 0.953               | 0.953               | 0.959               | 0.958               |

Robust standard errors in brackets

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

In the first two columns of Table 2, we report the results of the estimation of our model restricting the sample to high and medium-high income countries, according to the World Bank definition, both as exporters and importers. In column (1) we include the index of coverage of the agreement ( $tai_c$ ), while in column (2) we consider only legally enforceable provisions to proxy the depth of the agreement ( $tai_e$ ). The estimated coefficients are both positive and significant, but smaller in magnitude compared to those obtained on the full sample.

Finally, in the last two columns of Table 2, we consider North-South trade only. In particular, we restrict our sample to high and medium-high income exporters and to low and medium-low income importers. The estimated impact of trade agreements' coverage and depth is even larger in these specifications. Trade agreements between developed exporters and

developing importers are associated with larger exports from high income countries to low income ones.

### 3.3 Robustness checks

To check robustness of our results, we reestimate the main specifications of the model including EU Members as individual countries.

Table 3 report results of the estimation of the model considering the full sample, the North-North sample and the North-South one.

Table 3: FTAs and trade flows: Individual EU Members

|                 | Full sample |          | North-North |          | North-South |          |
|-----------------|-------------|----------|-------------|----------|-------------|----------|
|                 | (1)         | (2)      | (3)         | (4)      | (5)         | (6)      |
| tai_c           | 0.59***     |          | 0.60***     |          | 0.53***     |          |
|                 | [0.090]     |          | [0.102]     |          | [0.113]     |          |
| tai_e           |             | 0.62***  |             | 0.62***  |             | 0.56**   |
|                 |             | [0.092]  |             | [0.103]  |             | [0.115]  |
| Trade diversion | -0.00       | -0.00    | -0.00       | -0.00    | -0.00       | -0.00    |
|                 | [0.003]     | [0.003]  | [0.003]     | [0.003]  | [0.004]     | [0.004]  |
| Distance        | -0.75***    | -0.75*** | -0.73***    | -0.73*** | -0.74***    | -0.73*** |
|                 | [0.040]     | [0.040]  | [0.055]     | [0.056]  | [0.060]     | [0.061]  |
| GDP exporter_o  | 0.48***     | 0.48***  | 0.44***     | 0.44***  | 0.56***     | 0.56***  |
|                 | [0.038]     | [0.038]  | [0.044]     | [0.044]  | [0.037]     | [0.037]  |
| GDP importer    | 0.61***     | 0.61***  | 0.57***     | 0.57***  | 0.58***     | 0.58***  |
|                 | [0.045]     | [0.045]  | [0.044]     | [0.044]  | [0.046]     | [0.046]  |
| Language        | 0.19**      | 0.19**   | 0.20**      | 0.21**   | 0.17*       | 0.17*    |
|                 | [0.081]     | [0.081]  | [0.095]     | [0.095]  | [0.097]     | [0.097]  |
| Contiguity      | 0.40***     | 0.40***  | 0.47***     | 0.47***  | 0.49***     | 0.49***  |
|                 | [0.079]     | [0.080]  | [0.081]     | [0.081]  | [0.082]     | [0.082]  |
| Colonial ties   | 0.19*       | 0.20*    | 0.06        | 0.06     | 0.02        | 0.02     |
|                 | [0.115]     | [0.115]  | [0.123]     | [0.123]  | [0.128]     | [0.127]  |
| Currency        | -0.03       | -0.04    | -0.02       | -0.03    | 0.04        | 0.04     |
|                 | [0.083]     | [0.083]  | [0.089]     | [0.089]  | [0.096]     | [0.096]  |
| Constant        | -2.39***    | -2.42*** | 0.36        | 0.37     | 0.02        | -0.02    |
|                 | [0.805]     | [0.807]  | [0.695]     | [0.696]  | [0.757]     | [0.762]  |
| Observations    | 207,528     | 207,528  | 56,936      | 56,936   | 62,488      | 62,488   |
| R-squared       | 0.898       | 0.898    | 0.922       | 0.922    | 0.919       | 0.919    |

Robust standard errors in brackets

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

In columns (1) and (2) we report estimation results on the full sample. The estimated impact of gravity controls is very similar to the one obtained considering EU as a single country. The only relevant difference is that colonial ties has now a positive and significant effect on trade flows.

Analogously, the effect of trade integration, considering the depth of the agreements, has a positive and significant effect on trade flows, in particular when considering enforceable provisions. The estimation coefficients are similar, in magnitude, to the one obtained considering the EU as a single country.

Columns (3) and (4) of Table 3 we restrict the sample to North-North country pairs, considering medium-high and high-income countries both as a exporters and importers.

Compared to columns (1) and (2) of Table 2, the effect of trade agreements is stronger. Considering EU Members countries individually implies that the European Community is included among the agreements and this inflates the estimated coefficient.

Finally, columns (5) and (6) of Table 3 reports the results obtained considering high and medium-high income exporters and low and medium-low income importers. Compared to the results reported in Table 2, the effect of FTAs' depth is lower.

Another major issue in the estimation of the effect of preferential trade agreement on trade flows is the potential endogeneity of agreements' membership. This could be approached using instrumental variables estimator, but no good instruments for PTA variables are available. However, the type of gravity equation specification we adopt and our sample characteristics allow us to avoid this problem. On one hand, the rich set of country and time fixed effects most probably control for endogeneity bias [5]. On the other hand, between 2004 and 2011 only a small amount of new preferential trade agreements was signed. The decision to form the PTA was taken before we observe trade data. As a robustness check we eliminate from sample all agreements signed after 2004. Results are very similar in magnitude to the ones reported in Table 1, suggesting that in our sample PTA endogeneity is not a main problem<sup>5</sup>.

#### **4. Conclusion**

The robust result obtained across all estimation methods is that the estimated coefficient of the RTA variable is always positive and statistically significant, implying unambiguously that a significant increase in trade is expected to follow a positive conclusion of the negotiation. Furthermore, the impact of the agreement increases significantly as the depth and the scope of the agreement grows. The results also show that there is a small but significant trade diversion

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<sup>5</sup> Results available upon request

effect, meaning that the agreement between EU and the US could produce a small reduction in trade with other areas. But given the much smaller coefficient of the TD variable compared to the trade creation effect of the RTA variable, the expected net effect on trade remains strongly positive.

The TTIP bringing with it a higher complexity, but because of this it might also set the standards for future agreements between other countries and for multilateral negotiations.

## References

- Baier S.L., Bergstrand J.H. (2007), 'Do free trade agreements actually increase members' international trade?', *Journal of International Economics*, 71(1), pp.72-95.
- Baier S.L., Bergstrand J.H. (2004), 'Economic determinants of free trade agreements', *Journal of International Economics*, 64(1), pp.29-63.
- Baier S.L. *et al.* (2008), 'Do Economic Integration Agreements Actually Work? Issues in Understanding the Causes and Consequences of the Growth of Regionalism', *The World Economy*, 31(4), pp.461-497.
- Baldwin R. (1993), 'A Domino Theory of Regionalism', *NBER Working Papers*, 4465, National Bureau of Economic Research.
- Baltagi B.H., Egger P., Pfaffermayr M. (2014), 'Panel Data Gravity Models of International Trade', *CESifo Working Paper Series*, 4616.
- Cipollina M., Salvatici L. (2010), 'Reciprocal Trade Agreements in Gravity Models: A Meta-Analysis', *Review of International Economics*, 18(1), pp.63-80.
- ECORYS (2009), 'Non-Tariff Measures in EU-US Trade and Investment - An Economic Analysis', *Technical report, Study for European Commission, Directorate-General for Trade*.
- Egger P., Larch M. (2008), 'Interdependent preferential trade agreement memberships: An empirical analysis', *Journal of International Economics*, 76(2), pp.384-399.
- Egger P., Staub K. E. (2015), 'GLM estimation of trade gravity models with fixed effects', *Empirical Economics*, 1-39.
- Egger P., Wamser G. (2013), 'Multiple faces of preferential market access: their causes and consequences', *Economic Policy*, 28(73), pp.143-187.
- Fontagné L., Gourdon J., Jean S. (2013), 'Transatlantic Trade: Whither Partnership, Which Economic Consequences?', *Technical report*, 1, CEPII - Policy Brief.
- Francois J. *et al.* (2013), 'Reducing Transatlantic Barriers to Trade and Investment: An Economic Assessment', *IIDE Discussion Papers*, 20130401, Institute for International and Development Economics.
- Head K., Mayer T. (2013), 'Gravity Equations: Workhorse, Toolkit, and Cookbook', *CEPR Discussion Papers*, 9322.
- Head K., Mayer T., Ries J. (2010), 'The erosion of colonial trade linkages after independence', *Journal of International Economics*, 81(1), pp.1-14.
- Horn H., Mavroidis P. C., Sapir A. (2010), 'Beyond the WTO? An Anatomy of EU and US Preferential Trade Agreements', *The World Economy*, 33(11), pp.1565-1588.

- Kohl H., Brakman S., Garretsen H. (2013), 'Do Trade Agreements Stimulate International Trade Differently? Evidence from 296 Trade Agreements', *CESifo Working Paper Series*, 4243.
- Magee C. S. (2003), 'Endogenous Preferential Trade Agreements: An Empirical Analysis', *The B.E. Journal of Economic Analysis & Policy*, 2(1), pp.1-19.
- Mayer T., Zignago S. (2011), 'Notes on CEPII's distances measures: The GeoDist database', *Working Papers*, 2011-25, CEPII research center.
- Orefice G., Rocha N. (2014), 'Deep Integration and Production Networks: An Empirical Analysis', *The World Economy*, 37(1), pp.106-136.
- Santos Silva J. M. C., Tenreyro S. (2006), 'The Log of Gravity', *The Review of Economics and Statistics*, 88(4), pp.641-658.

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## **Sommario**

In questo lavoro stimiamo gli effetti sul commercio internazionale del Transatlantic Trade and Investment Partnership utilizzando un modello gravitazionale. Nella specificazione vengono introdotte ipotesi collegate alle specificità di questo accordo. I risultati, in linea con la letteratura, prevedono un chiaro aumento del commercio estero come conseguenza della firma dell'accordo. Inoltre, i risultati mostrano che l'effetto sul commercio internazionale è tanto più grande quanto più esteso e profondo sarà il contenuto dell'accordo. Sebbene l'effetto netto totale sul commercio è positivo, i risultati mostrano anche la presenza di una diversione del commercio internazionale.

## **Abstract**

In this paper we estimate the trade effects of the Transatlantic Trade and Investment Partnership by means of a gravity model. Even if making some assumptions related to the specificity of this trade agreement, our results are in line with the existing studies, implying unambiguously that a significant increase in trade is expected to follow a positive conclusion of the negotiation. Furthermore, the impact of the agreement increases significantly as the depth and the scope of the agreement grows. The results also show that there is a small but significant trade diversion effect, meaning that the agreement between EU and the US could produce a small reduction in trade with other areas. But given the much smaller coefficient of trade diversion compared to the trade creation effect, the expected net effect on trade remains strongly positive.

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