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The Effects of the TTIP on EU Countries: An Ex-ante Evaluation

El impacto del TTIP en los países europeos: una evaluación ex-ante

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Abstract

The EU and the US are involved currently in discussions of what is called the Transatlantic Trade and Investment Partnership (TTIP). Up to now, there have been several attempts to assess the economic impact of the TTIP, both at the EU-wide level and for some of the EU countries. None of these studies, however, pays any attention to the potential impact of the TTIP on every EU country, which is the main aim of this paper. In a nutshell, the main findings indicate that the effects of the TTIP agreement are going to be small, albeit positive, and not equally distributed. More specifically, the most developed countries tend to be those that, potentially, will undergo a higher increase in their trade with the US, so they are more likely to reap benefits from the TTIP than the less developed countries. This being so, the TTIP will (weakly) increase cross-country disparities.

Keywords: TTIP; Trade; EU Countries; Cross-country Disparities.

Resumen

La UE y Estados Unidos están embarcados en conversaciones sobre lo que se llama el "Transatlantic Trade and Investment Partnership (TTIP)". Ha habido, hasta ahora, varios intentos de evaluar el impacto económico del TTIP, tanto a nivel europeo como para algún país en particular. Ninguno de estos estudios, sin embargo, presta atención al impacto del TTIP sobre cada país europeo, principal objetivo de este trabajo. De forma resumida, los principales resultados indican que los efectos del TTIP van a ser positivos aunque reducidos, y no van a estar distribuidos de forma equitativa. De forma más precisa, los países más desarrollados tienden a ser los que, potencialmente, experimentarán un mayor incremento en el comercio con Estados Unidos, por lo que resultarán más beneficiados que los países menos desarrollados. Siendo esto así, el TTIP incrementará (débilmente) las disparidades entre países.

Palabras clave: TTIP; Comercio; Países de la UE; Disparidades entre países;

JEL classification: F14, F62, R11.

1. Introduction: why a TTIP agreement? [1]

The EU and the US are currently involved in the discussion of what is called the Transatlantic Trade and Investment Partnership (TTIP).[2] Although its specifics are not yet well defined, the TTIP is meant as a free trade agreement between both parties. As with any free trade agreement, its essence lies in the reduction of tariff and non-tariff barriers to trade and investment, while its attractiveness is linked to the potential positive effects of trade and investment on economic welfare.[3]

But, why a TTIP agreement between the EU and the US? There are, in principle, two closely related reasons. First, the EU-US trade is the largest bilateral trade in the world (Erixon and Bauer, 2010). Taken together, the EU and the US represent nearly 45% of world trade.[4] Second, the trade links between them are very strong. The US is, excluding intra-EU trade and according to 2014 data, the most important trade partner of the EU, accounting for 17.5% of extra-EU exports and 11.7% of extra-EU imports. From the point of view of the US, the EU is also a very relevant partner, as it is the destination of around 17% of both exports and imports.

The intensity of the trade relations between the EU and the US is, probably, the main structural feature behind the TTIP. The economic rationale for this agreement is, however, intensified by three other developments: first, by the urgent need to boost the rate of economic growth (both in the EU and in the US) after the 2008 crisis; second, by the failure of the Doha round of multilateral trade talks; and third, by the necessity for both parties to regain some of the competitive advantages lost to the emerging economies (Felbermayr and Larch, 2013; Hayes, 2015). To a higher or lower extent, depending on the perspective adopted, it is thought that an improvement in the three aforementioned developments could potentially be achieved through the implementa-

[1] This paper is based on a report (devoted to the situation of European (Spanish) regions rather than European countries) originally prepared for SIEPS (Villaverde and Maza, 2015a). The authors thank SIEPS for funding this collaboration. The authors also thank two anonymous referees for their useful comments and suggestions.

[2] The US has just reach an agreement with another eleven Pacific Rim countries about what is known as the Trans-Pacific Partnership (TPP). This agreement is, up to now, the most important commercial agreement in the economic history of the world.

[3] Here, however, we give attention solely to the trade side of the agreement. For an analysis of FDI devoted to the European regions, see e.g. (Villaverde and Maza, 2015b; Maza and Villaverde, 2015)

[4] It is important to note that this figure includes intra-EU trade.

tion of the TTIP agreement.[5]

Regarding this issue, there is a vast literature that analyses, from a theoretical point of view, the potential impacts of free trade agreements (Plummer *et al.*, 2010). It points out that this type of agreements has both static and dynamic effects, which can be instrumental for countries joining the agreement. From an empirical perspective, papers addressing this issue use ex-ante and/or ex-post methods. For the specific case of the TTIP, however, there are only some ex-ante evaluations, all of them based, to the best of out knowledge, on general equilibrium models.[6] All these works take, as a case study, the EU as a whole or just some of the EU countries, but none of them examines the issue from the point of view of all EU individual countries.

Taking these considerations into account, the aim of this paper is to provide some empirical preliminary evidence on the likely impact of the implementation of the TTIP for every EU country. To the best of our knowledge, this is the first paper dealing with this issue. More specifically, this paper tries to answer the following questions: What will be, in principle, the effects of the TTIP on every EU country? Will they be quite remarkable? Will they be equally distributed? To answer these questions, and taking data mainly from the Datacomex (http://datacomex.comercio.es/) and Comtrade (http://comtrade.un.org/) databanks, we will carry out an ex-ante evaluation for the period 2000-2014 based on trade indicators. This is due to the fact that a general equilibrium model requires much more information and this is scant for many countries. Because of this, a word of caution seems to be mandatory: Due to the methodological approach of the paper the conclusions drawn should be considered as very preliminary and not representative of pure causality.

So, bearing in mind the preliminary nature of this study, we can state the results reveal that the effects of the TTIP will be rather limited and not equally distributed across EU member states. We also find that he most benefited countries will be the most developed ones.

The paper is structured as follows. First, a brief review of EU-US trade relations is conducted. Next, the controversy about the impact of the TTIP at the European-wide level is reviewed. Afterwards, an ex-ante analysis of the potential directions[7] of TTIP effects on the EU countries is carried out. Finally, some concluding remarks are offered.

[5] In a nutshell, it is thought that the TTIP agreement will help to increase the volume of trade among the partners, and therefore, their economic welfare (Lloyd and Maclaren, 2004). Namely, it will "contribute to the development of global rules that can strengthen the multilateral trading system" (Schott and Cimino, 2013:1), and will give an important boost to the role played by the EU and the US in the world.

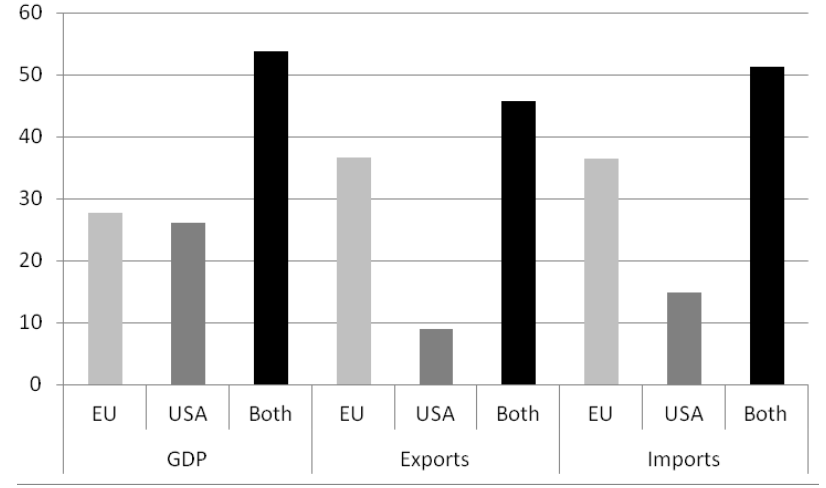
[6] These studies are summarised in Section 3.

[7] All papers addressing the potential impact of the TTIP point out that the qualitative results (direction of changes) given by them are much more reliable than the quantitative ones.

2. EU-US trade relations

In order to get an idea of the relevance of the potential economic gains from the TTIP, we agree with Erixon and Bauer (2010) that there are at least three aspects that should be taken into consideration (Figure 1). The first one relates to size, and this is that size matters. Because we are referring to two of the largest economies in the world (taken together, they account, on average for the period 2000-2014, for 53.7% of world GDP), it is expected that the effects of the TTIP agreement will be bigger than those of similar agreements between smaller economies: therefore, the interest in unveiling its potential economic consequences. The importance of size is not only related to the share of the two parties in their respective GDP, but also, as previously mentioned, in world trade; this share is also very high, as it represents, once again on average for the period 2000-2014, 45.7 and 51.3% of, respectively, global exports and imports.[8]

Figure 1. Share (%) of EU & US on world total



Source: World Development Indicators (World Bank) and own elaboration.

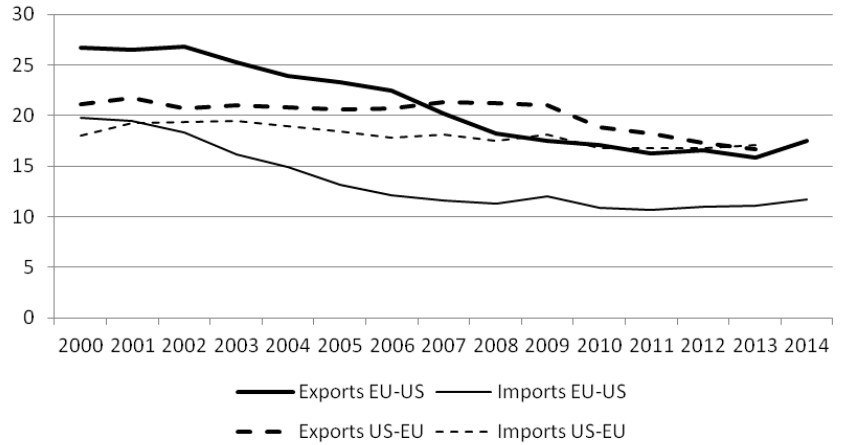
The second feature relates to the amount of the bilateral trade between the two parties. As mentioned before, EU-US trade is one of the largest bilateral trade relationships in the world. This being the case, it is also true that, in

[8] If the intra-EU trade were excluded, the EU-US trade would account for about a third of world trade. It is also convenient to say, although it is out of the scope of the paper, that the importance of EU-US is even higher from the point of view of FDI; when taken together, the inward FDI in the EU and the US represents around 60% of the world FDI, while the outward FDI is around 70%.

2000, the share of this bilateral trade was much larger than in 2014 (Figure 2). In addition, its evolution presents a rather stable declining pattern over time, most probably linked to the increase in the role played by the emerging economies in global trade. There is no doubt that this is one of the main reasons behind the TTIP.

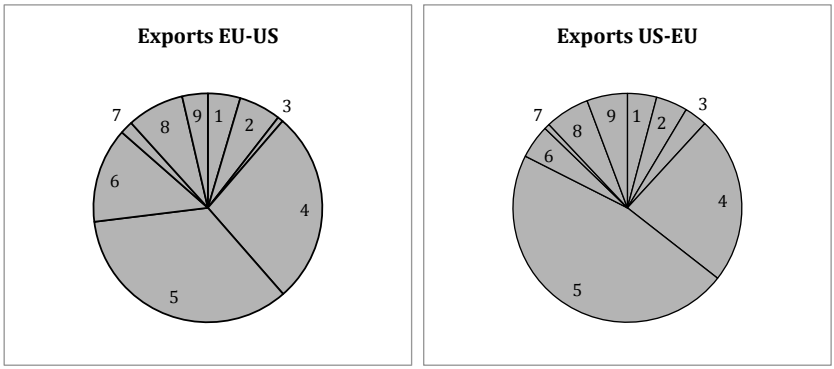
The third aspect that should be considered refers to the composition of trade between the EU and the US. Although at a highly aggregated level, Figure 3 shows that the trade profile is very similar, as should be expected considering the high level of development of both parties. As can be seen, equipment goods, intermediate manufactured goods, consumer products and automobiles are the most important sectors. In any case, it is noteworthy that the grouping in Figure 3 masks the relevance of some industries playing a crucial role in EU-US trade; among them, medicaments, organic chemicals, electrical machinery and apparatus, precision instrument manufactures, industrial machinery, road motor vehicles, petroleum products, and aircraft and associated equipment stand out.

FIGURE 2. EU-US BILATERAL MERCHANDISE TRADE (% OF TOTAL EXCLUDING INTRA-EU TRADE)



Source: Datacomex, Comtrade and own elaboration.

Figure 3. Composition of bilateral merchandise trade (period 2000-2014)



Note: 1. Food, beverages and tobacco; 2. Energy products; 3. Primary materials; 4. Intermediate manufactured goods; 5. Equipment goods; 6. Automobile sector; 7. Durable consumer products; 8. Consumer products; 9. Other goods.

Source: Datacomex and own elaboration.

3. The controversy over the assessments of the economic impact of the TTIP[9]

As is well known, a free trade area is an agreement between two or more economies that implies the reduction/elimination of tariffs, as well as quantitative restrictions and preferences on most (if not all) goods and services traded between them. At the same time, these economies keep their own trade regime to the rest of the world. A free trade area can cause both positive and negative effects through, respectively, trade creation and trade deviation, the final result, from a welfare point of view, depending (for each member country of the area and for the rest of the world) on the relative strength of these two effects. The final economic impact of a free trade area remains, therefore, an empirical issue.

From this empirical perspective, there are both ex-ante and ex-post methods to try to evaluate the impact of free trade agreements (Plummer *et al.* 2010). Regarding the ex-ante evaluation, i.e. the potential impact, there are three main approaches: two of them, namely the use of trade indicators and the estimation of computable general equilibrium models, focus on the effects at the macro level, while the other, based on the estimation of the so-called

[9] Although the criticism of the TTIP stems from different angles, and some of them are even shown in the streets and public places, here we give attention only to the economic perspective. For a mostly political and very critical review of the TTIP, see Hilary (2014). For an incisive analysis of costs and benefits, see De Ville and Siles-Brugge (2015). It is also interesting to note that the recent TPP agreement is facing similar criticism to those of the TTIP.

SMART model,[10] focuses on the impacts at the industry level. As for the ex-post evaluation, i.e. the actual impact, the use of gravity models is the most common approach.

Because we are still in the initial stages of creating a free trade area between the EU and the US, and the TTIP has not yet been approved and implemented, the various analyses of its impact that have been carried out are, out of necessity, ex-ante evaluations. According to Raza *et al.* (2014), four major reports have been produced: Berden *et al.* (2009) for ECORYS, Fontagné *et al.* (2013) for CEPII, Francois *et al.* (2013) for CEPR, and Felbermayr *et al.* (2013a) for Bertelsmann/Ifo. Interestingly enough, all four of these reports apply, basically, the same methodology, namely different versions of a rather similar general equilibrium model.

The assessments in these four reports proceed via a simple mechanism: price changes. The idea behind them is that the removal of trade barriers brings about a reduction of trade costs, and therefore, a decrease in input costs, production costs and domestic prices, with the corresponding productivity gains (through enabling further specialisation and exploitation of scale economics) and mark-up reductions. This implies higher output, higher incomes, and higher real wages. More specifically, the main findings and assumptions of the four abovementioned reports, which should be "best understood as a ballpark indication of the economic effects rather than precise predictions of exactly what will happen" (European Commission, 2013:3), are as indicated in Table 1.

Generally speaking, the conclusion is that the impact of the TTIP agreement on the EU –the bulk of it (around 80% of the total) stemming from lowered non-tariff barriers–[11] is positive and non-negligible, but rather limited and very distributed over time. As stated by Raza *et al.* (2014:4), the changes are long-term, that is, they "will accrue only over a transition period of 10 to 20 years". Even so, these results are mostly considered to be a bit overoptimistic, as they are based on some assumptions that are not fully realistic –e.g. the CEPII and CPR studies consider free labour and capital mobility (full employment) – and are obtained without paying due attention to either (macro and social) costs (Dieter, 2014) or negative third-country effects.[12] Put another way, it is generally expected that the positive effects of static and dynamic trade creation will outweigh the corresponding negative effects of static and dynamic trade diversion, but most probably, only by a small margin.

[10] Contrary to the other models, the SMART (Software for Market Analysis and Restrictions on Trade) is a partial equilibrium model, in that it focuses on just a single good.

[11] This is because the current level of tariffs on bilateral trade is very low: on average, around 2.2% and 3.3% in the US and the EU, respectively (Fontagné *et al.*, 2013).

[12] To a certain extent, the controversy about the size and distribution of the TTIP's impact arises from the fact that "its nature is more like a wide-ranging regulatory agreement, with some elements of classical trade agreements as well" (Pelkmans *et al.*, 2013:1). On this same issue, see also Richter and Schäffer (2014).

Table 1. Assumptions and impact of TTIP agreement

	Berden *et al.* (2009)*	Fontagné *et al.* (2013)	Francois *et al.* (2013)	Felbermayr *et al.* (2013a)
Basic Assumptions				
Forecast period	2008-2018	2015-2025	2017-2027	10-20 years
No. of Scenarios	7	5	5	3
Tariffs reduction	100 % of goods 75 % of services	100 %	98 - 100 %	100 %
NTM reduction in reference scenario	25 %	25 %	25 %	Reduction corresponding to trade creation effect
Main Findings (different scenarios, percentage changes compared to baseline scenario within forecasting period)				
EU GDP	0.32 - 0.72	0.0 - 0.5	0.02 - 0.48	0.52 - 1.31++
US GDP	0.13 - 0.28	0.0 - 0.5	0.01 - 0.39	0.35 - 4.82++
EU bilateral exports	not specified	49.0+	0.69 - 28.0	5.7 - 68.8++
EU total exports	0.91 - 2.07	7.6+	0.16 - 5.91 (extra-EU only)	not specified
EU real wages	0.34 - 0.78	N/A	0.29 - 0.51	not specified
Unemployment rate in EU-OECD countries (average % points)	unchanged (assumption)	unchanged (assumption)	unchanged (assumption)	- 0.42 (deep liberalisation)

Notes: (*) Findings for ambitious and limited scenarios only; (+) Reference scenario only; (++) Derived from Felbermayr *et al.* (2013b), aggregated to EU27 level.
Source: Raza *et al.* (2014)

As with most free trade agreements, the TTIP might also pose some additional problems, as its geographic and sectoral distribution is likely to be very unequal. According to the BMWT/Ifo report,[13] the range of the GDP improvement goes from a maximum of 3.22% for the UK to a minimum close to 0% for France (0.06%) and Austria (0.10%). There are, for instance, countries with potential effects higher than the EU average, like Sweden (2.15%), Ireland (1.99%) and Spain (1.83%), whereas countries with effects below the average can be found, such as Italy (1.10) and Germany (0.99%), among others.[14]

[13] This report, published in German, is referred to here as Felbermayr *et al.* (2013b).
[14] As suggested in the Introduction, all of these numerical values should be taken with due caution. Just to give an example, the computation of the GDP change for Sweden performed by Kinnman and Hagberg (2012) for the Kommerskollegium (National Board of Trade) gives a much lower impact than that of the BMWT/Ifo report. Kinnman and Hagberg's study estimates that the increase in GDP would be just between 0.1% and 0.2%, this result depending on which scenario (less ambitious, more ambitious) is considered with relation to the reduction of non-trade barriers. A likely reason the results of both reports differ is that Kinnman and Hagberg's study "does not include direct foreign investments or consider any dynamic effects" (Kinnman and Hagberg, 2012:3).

By adopting a sectoral perspective, the CEPR report, which obtains similar conclusions to the ECORYS report, shows that, from the EU point of view, the most benefited sectors would be those of Motor Vehicles,[15] Water Transport and Insurance, whereas those with the worst results would be Electronic Machinery, Metals and Metal Products and Other Transport Equipment. As suggested by Raza *et al.* (2014), these potential sectoral effects will also vary greatly from country to country, which, at best, means that they are not very informative at the country level.

4. The potential effects of the TTIP on the EU countries: a preliminary analysis based on trade indicators

As mentioned in the previous section, and even though they are subjected to much criticism, the computation of general equilibrium models has become the standard approach to evaluate the potential impact of the TTIP agreement, both at the EU-wide level and for some of the EU countries, such as Germany, Sweden, the Netherlands and the United Kingdom.[16] When it comes to the assessment of the TTIP's impact, another possibility, less demanding in terms of data, is to carry out indirect ways of estimation based on trade indicators.[17]

But, before proceeding further, we think it is compulsory to provide a word of caution. Although all of these indices are quantitative indicators, they do not allow one to obtain any quantitative approximation to the impact of the TTIP, either on trade flows, GDP rates of growth, employment evolution, or say, welfare changes. They only allow one to reach a qualitative assessment of the TTIP.[18]

Bearing these considerations in mind, the indicators computed here are those typically employed in empirical studies of international trade performance at the country level; they are, in essence, related to intraregional trade and trade orientation.

To save space, we compute all our indicators for the average of the period 2000-2014 and for two sub-periods: the pre-crisis period (2000-2007) and the crisis period (2008-2014). All indicators referring to the whole period, as well as some dispersion statistics, are shown in Table 2, while those referring to sub-periods are reported in the Appendix (Table A.1).

To begin with, it is important to know how much each country trades with the rest of the world, that is, how well the country is integrated in world trade. The indicator measuring this is the *Trade Openness (TO)* index, given by the sum of total

[15] Even being the most positive change for the EU, the total impact would be very small, as it would be the result of a 1.5% increase in output times 2.2 (the share of the sector in EU27 output).
[16] The corresponding reports are: Felbermayr and Aichele (2014) for Germany, Kinnman and Hagberg (2012) for Sweden, Plaisier *et al.* (2012) for The Netherlands, and CEPR (2013) for the UK.
[17] Similar analysis have been carried out, among others, by Cheong (2010) for the ASEAN and NAFTA cases, Davis *et al.* (2009) for the Australia-Indonesia trade and investment agreement, Péridy (2005) for the PAN-ARAB free trade area, and Michaely (1996) for trade preferential agreements in Latin America.
[18] By borrowing from Michaely (1996), it can be said that these indicators just evaluate the relevance and desirability of multilateral trade agreements, such as the TTIP.

exports and imports of the country to its GDP; obviously, the higher the index, the more open the country under study. The expression for the index is as follows:

$$TO_i = 100 * \left[\frac{(X_i+M_i)}{GDP_i}\right] \quad (1)$$

where *X* and *M* denote, respectively, exports and imports, and *i* refers to the country. The values of *TO* for the EU countries are shown in the first column of Table 2. According to them, three main conclusions can be drawn: 1. The degree of openness varies greatly among countries; 2. On average, the degree of openness is quite high; and, 3. Generally speaking, it has increased over the crisis period (Table A.1); more specifically, eleven countries report increases over 10%, with Slovakia standing out on this side (degree of openness increased by 42.4%, comparing pre-crisis and crisis periods), while only two countries (Ireland and Luxembourg) experienced a decrease of over 10%. Now, because the more open a country is, the more prone to gain from regional trade agreements it will be, the inference that can be obtained from these results is that there are countries already showing a very high openness degree (Belgium, Slovakia and Hungary to name a selected few) whereas there are others (e.g. Greece, Cyprus and United Kingdom) for which, potentially, there is much room for increasing the degree of openness.

Being too general, the previous conclusion has to be somewhat extended and qualified. This is so because the final impact of the TTIP will depend, among other things, on the relative extent of the total foreign trade that each country conducts with the US and on its sectoral composition; therefore, as stated by Michaely (1996:11), "the share of trade with a partner is thus an important consideration in pre-judging the likelihood of a beneficial agreement".[19] As for the extent of this trade, we calculate a very simple *Trade Share (TS)* index:

$$TS_i = 100 * \left[\frac{(X_{i-US} + M_{i-US})}{(X_i + M_i)}\right] \quad (2)$$

where *X*, *M,* and *i* have the aforementioned meanings, and *US* refers to United States. This index ranges from 0 to 100, and according to Plummer *et al.* (2010), the closer to 100, the higher the weight of US in the total trade and, therefore, the higher the positive potential trade impact of the TTIP. Table 2, column 2, shows at least two interesting results. First, the importance of the US as a trade partner also varies a lot for the EU countries; as can be seen, both the ratio between deciles and the coefficient of variation (CV) are even higher than with the *TO* index. Second, as a whole, the index tends to be quite low; this result seems to be in contradiction with previous Figure 2, but the reason is that now we think intra-EU trade has to be considered in the calculus (if not,

[19] "This is so because a trade-preferential agreement is likely to be more relevant and lead to less trade diversion and more trade creation the higher is the share of" imports from the potential partner and the exports to it (Michaely, 1996:11).

the figures would be much higher). Another important result is that, and although apart from some specific cases the index has not experienced dramatic changes over the sample period (Table A.1), most of the countries (25 out of 28) have decreased their relative trade with the US. Therefore, the relatively low *TS* index for the EU countries and its decrease over time implies that, to a high extent, they do not consider the US as a high potential market, perhaps because there are still some important barriers to trade. Although some of them will disappear or be lowered as a result of the TTIP agreement, some others (mainly the costs associated with distance) will not change very much, if any, with the implementation of the agreement. The tentative implication of the previous results is that the potential impact of the TTIP on most EU countries will be rather low, because in general terms the US cannot be considered as a natural trading partner for them.

If we consider the results obtained for the *TO* and *TS* indices together, we can have a more accurate idea of the likely effects of the TTIP on the EU countries. By simply multiplying both indices, we conclude (third column of Table 2) that, as a general rule, most developed countries will potentially be the more benefited ones (these countries are by ranking Ireland, Belgium, Malta, Netherlands, United Kingdom, Germany and Sweden), while some of the less developed (Greece, Latvia, Romania, Poland and Croatia) will obtain proportionally fewer benefits from the TTIP agreement.

In addition to the two previous indicators, and in order to better assess –although still at a very general level– the potential effects of the TTIP on the European countries, it can be useful to compute some other trade indicators with information at sectoral level. Therefore, all of the remaining indicators have been constructed by using data on bilateral trade between each one of the EU countries and the US, disaggregated at the STIC 2-digit (Revision 3).

Table 2. Trade indicators (average 2000-2014)

Countries	*TO*	*TS*	*(TO*TS)/100*	*TD (X)*	*TD (M)*	*IIT*	*TC (X)*	*TC (M)*
FRANCE	44.4	5.8	2.6	6.4	8.8	77.6	65.9	74.8
BELGIUM	169.0	6.0	10.1	13.6	7.3	68.3	64.1	65.3
LUXEMBOURG	92.6	3.4	3.1	18.8	27.0	29.3	53.9	65.1
NETHERLANDS	124.8	5.4	6.8	5.6	5.4	56.8	66.8	66.2
GERMANY	65.1	6.6	4.3	10.7	5.8	59.0	65.5	77.3
ITALY	43.6	5.4	2.3	4.2	5.2	49.7	63.7	68.8
UNITED KINGDOM	40.1	10.7	4.3	6.7	5.4	68.1	74.6	75.1
IRELAND	83.6	17.4	14.5	20.0	9.1	39.9	40.1	73.5
DENMARK	60.2	4.6	2.8	8.3	6.4	44.1	60.2	73.2
GREECE	33.0	3.1	1.0	10.5	11.2	35.9	57.0	63.2
PORTUGAL	54.8	3.0	1.6	8.6	5.4	39.7	66.2	69.0
SPAIN	43.3	3.5	1.5	5.0	5.0	64.3	66.6	70.5
SWEDEN	61.3	6.0	3.7	7.3	6.0	46.9	66.2	74.3
FINLAND	59.3	4.7	2.8	8.4	5.6	42.7	52.3	70.9
AUSTRIA	80.5	3.5	2.8	6.3	9.5	53.4	64.1	74.3
ESTONIA	129.9	2.6	3.3	32.5	5.4	29.9	65.3	70.3
LITHUANIA	117.8	2.3	2.7	33.9	10.4	20.3	64.8	63.1
MALTA	107.9	7.9	8.5	59.2	17.2	44.0	46.1	61.4
LATVIA	86.7	1.2	1.0	6.7	4.9	40.8	55.6	66.9
POLAND	69.3	1.9	1.3	5.6	5.1	69.0	66.7	74.6
CZECH REPUBLIC	126.7	1.9	2.4	5.9	6.3	68.2	67.9	75.8
SLOVAKIA	138.0	1.4	2.0	37.7	5.9	28.8	65.9	71.0
HUGARY	135.5	2.4	3.2	12.1	8.3	62.8	67.4	73.3
SLOVENIA	120.4	1.7	2.1	9.6	10.8	39.4	60.5	69.9
CYPRUS	39.7	2.2	0.9	15.2	5.6	21.4	63.6	61.6
ROMANIA	68.7	1.9	1.3	8.2	5.1	40.3	62.8	72.7
BULGARIA	102.0	1.7	1.7	7.1	5.1	39.2	60.8	63.7
CROATIA	59.1	2.3	1.3	17.0	5.6	48.0	61.8	68.1
Dispersion Statistics								
D9	131.6	7.0	7.3	32.9	10.9	68.3	67.0	74.9
D1	42.3	1.7	1.2	5.6	5.1	29.2	53.4	63.1
Ratio D9/D1	3.1	4.0	6.0	5.9	2.1	2.3	1.3	1.2
CV	0.4	0.8	0.9	0.9	0.6	0.3	0.1	0.1

Note: D1 and D9 denote first and last deciles, respectively. CV refers to the coefficient of variation.

Source: Datacomex, Comtrade, WDI and own elaboration

The first one is the *Trade Diversification (TD)* index, computed, in our case, as the well-known Herfindahl-Hirschman index. The rationale behind the use of this indicator is that the more diversified the exports and imports of an economy, the higher the potential impact of the TTIP. The index, computed for both exports and imports, is the following:

$$TD_i = 100 * \left[\sum_{j=1}^{N} s_{ij-US}^2\right] \quad (3)$$

where $s_{ij\text{-}US}$ is the share of sector *j* in country *i* exports (or imports) with the US, and *N* is the number of sectors. The index is bounded between 0 (exports/imports are fully diversified) and 100 (exports/imports are fully concentrated on just one product). The computation of this index for all European countries yields the results shown in the fourth and fifth columns of Table 2. According to them, some remarkable conclusions can be obtained. First, it happens once again that there are large differences across countries; in this case, the deciles ratio and the CV are especially higher regarding exports. Second, the values of the index tend to be rather low, which implies that the degree of diversification is high; put in another way, the gains from the TTIP could be, at least from this perspective, rather important. Third, and although the pattern here is less obvious than with the previous indices, it still happens that some of the less developed countries (e.g. Lithuania, Slovakia, Estonia and Croatia) will be among the less benefited by the trade agreement; the opposite is not true, however, for some of the most developed countries (e.g. Belgium and Germany). Fourth, Table A.1 also shows that, in this case, there have been significant changes over the two sub-periods; in some cases the degree of diversification has significantly decreased over the crisis (namely, Sweden, Finland and Malta among others) whereas in other cases the degree of diversification has notably increased (such as Spain, Lithuania, Belgium and Poland).

The calculation of the degree of intra-industry trade is also helpful in our task, as it provides information about how much trade between our economies occurs within the same industry. The rationale behind this index is that the higher its value, the more inclined an economy is to sign a free trade agreement with another economy (the US, in this case), and this will foster the level of intra-industry trade even more. The *Intra-industry Trade (IIT)* index computed here, and adaptation of the famous Grubel and Lloyd index, is given by the expression:

$$IIT_i = 100 * \left[\frac{\sum_{j=1}^{N}\left[\left(X_{ij-US}+M_{ij-US}\right)-\left|X_{ij-US}-M_{ij-US}\right|\right]}{\sum_{j=1}^{N}\left(X_{ij-US}+M_{ij-US}\right)}\right] \quad (4)$$

where all variables have the already known meanings. The index is between 0 and 100, and as in previous cases, the higher its value, the higher the degree of intra-industry trade. The results obtained for this index for the bilateral trade between each EU country and the US are displayed in the sixth column of Ta-

ble 2. These results allow us to conclude that disparities across the European countries, although significant, are not as high as in the rest of indices. On average, the degree of intra-industry trade is relatively high; in fact, there are ten countries (France clearly standing out) for which the index is above 50. In addition, it is also evident that changes between the pre-crisis and crisis sub-periods have been very large (Table A.1).

Finally, another interesting trade indicator designed to evaluate the relevance of preferential trade agreements is the so-called *Trade Complementarity (TC)* index, which measures the degree of complementarity of the economic structures among the areas involved in the analysis.[20] To fully evaluate the degree of complementarity, this index should be calculated for both exports and imports of the reporting country. As for the exports, this index measures "to what extent the export profile of the reporter matches, or complements, the import profile of the partner" (World Bank, 2013:19). Formally, it is given by the expression:

$$TC(X)_i = 100 * \left[1 - \left(\frac{\sum_j \left|\frac{m_{kj}}{M_k} - \frac{x_{ij}}{X_i}\right|}{2}\right)\right] \quad (5)$$

where x_{ij} is the value of the exports of sector j from reporter country i, and x_k is country i's total exports, while partner country k's (in this case, the US) value of the imports of product j is given by m_{kj}, and its total imports value is denoted by M_k.

For imports, the index is given by:

$$TC(M)_i = 100 * \left[1 - \left(\frac{\sum_j \left|\frac{x_{kj}}{X_k} - \frac{m_{ij}}{M_i}\right|}{2}\right)\right] \quad (6)$$

where m_{ij} is the value of the imports of sector j from reporter country i, and M_i is country i's total imports, while partner country k's (in this case, the US) value of the exports of product j is given by x_{kj}, and its total exports value is denoted by X_k.

In both cases, the index ranges from 0 to 100, with 0 being the case of perfect negative correlation (the two areas are perfect competitors) and 100 that of perfect positive correlation between sectoral shares (the two areas are ideal trading partners). Therefore, the closer the index to 100, the higher the potential gains from a bilateral or regional trade agreement like the TTIP. When the *TC* indices are computed for each one of the EU countries and the US, the results (the last two columns of Table 2) show that: 1. Although cross-country disparities are still evident, they are much lower than with all of the previous indicators; 2. The degree of complementarity is very high for quite a few cases

[20] This index has been widely used in empirical studies on preferential-trade agreements. See, for instance, Michaely (1996) and Ng and Yeats (2003).

(United Kingdom, Czech Republic standing out); anyway, it can also be seen that complementarity is higher on the EU national import side than on the export one; 3. Regarding the evolution of the *TC* index over time (Table A.1), our findings reveal that changes have been quite significant in several cases; for some countries the crisis has remarkably decreased the complementary degree of bilateral trade (e.g. Ireland) while for others has increased it (e.g. Latvia and Bulgaria), and for some others the effect differs depending on the (export and import) side under consideration (e.g. Greece).

The computation of the trade indicators performed so far gives us an idea of what the EU countries could reasonably expect after the implementation of the TTIP. Accordingly, it seems that the TTIP is going to be especially beneficial to the most developed countries. Although still within the qualitative realm mentioned above, we consider that this idea could have a more quantitative support by performing a rather simple analysis, made up of three steps. First, by using the battery of indices already computed, we calculate a trade composite indicator as the average of the following partial indicators (Table 3): 1. The product of the *TO* and *TS* indices, duly normalised;[21] 2. The average of the *TD(X)* and *TD(M)* indices;[22] 3. The *ITT* index; 4. The average of the *TC(X)* and *TC(M)* indices. Second, we collect per capita GDP data for all of the EU countries from the World Development Indicators databank (World Bank) and use them as a proxy for the level of development of the countries (see also Table 3). Finally, we calculate the correlation coefficient between the composite indicator and per capita GDP. The result obtained reveals that there is a positive and statistically significant (at 95% level) correlation between our trade composite indicator and the degree of development (the correlation coefficient is 0.33).[23] This result somewhat reinforces our previous statement: The TTIP agreement is, probably, going to widen cross-country disparities in the EU. At the very least, it will not contribute to reduce these differences, as the composite indicator's ranking is mainly led by rich countries (Ireland, Belgium, UK, Netherlands, France, Germany and so forth), while the last positions are mostly held by relatively poor countries (e.g. Latvia, Bulgaria and Romania); in fact, if you calculate the Spearman's rank correlation coefficient the figure rises to 0.47.

[21] This index has been normalised in order to prevent it from having an inappropriate weight in the composite indicator.

[22] In this case, as well as in the TC case, we have calculated an average in order to avoid double counting.

[23] If we exclude Luxembourg, because it can be consider as an outlier (it is almost twice richer than the next country), the correlation coefficient turns out to be 0.48. In addition, and for the sake of robustness, we also ran a regression between per capita GDP and our composite indicator, both by using parametric and non-parametric techniques, and the findings revealed, too, a positive relationship between these variables.

Table 3. Trade indicators and per capita GDP (average 2000-2014)

Countries	TO*TS Normalised	Mean TD	IIT	Mean TC	Trade Composite Indicator*	Per capita GDP+
FRANCE	12.5	7.6	77.6	70.4	42.0	34970
BELGIUM	67.6	10.5	68.3	64.7	52.8	37048
LUXEMBOURG	16.2	22.9	29.3	59.5	32.0	80084
NETHERLANDS	43.4	5.5	56.8	66.5	43.1	42394
GERMANY	25.0	8.3	59.0	71.4	40.9	36447
ITALY	10.3	4.7	49.7	66.2	32.7	31122
UNITED KINGDOM	25.0	6.1	68.1	74.9	43.5	39385
IRELAND	100.0	14.6	39.9	56.8	52.8	49131
DENMARK	14.0	7.4	44.1	66.7	33.1	47974
GREECE	0.7	10.9	35.9	60.1	26.9	21052
PORTUGAL	5.1	7.0	39.7	67.6	29.9	18749
SPAIN	4.4	5.0	64.3	68.5	35.6	25910
SWEDEN	20.6	6.7	46.9	70.2	36.1	43284
FINLAND	14.0	7.0	42.7	61.6	31.3	38794
AUSTRIA	14.0	7.9	53.4	69.2	36.1	39152
ESTONIA	17.6	19.0	29.9	67.8	33.6	10314
LITHUANIA	13.2	22.2	20.3	63.9	29.9	8394
MALTA	55.9	38.2	44.0	53.8	48.0	15450
LATVIA	0.7	5.8	40.8	61.2	27.1	7712
POLAND	2.9	5.4	69.0	70.7	37.0	8941
CZECH REPUBLIC	11.0	6.1	68.2	71.8	39.3	13605
SLOVAKIA	8.1	21.8	28.8	68.5	31.8	12845
HUGARY	16.9	10.2	62.8	70.3	40.1	10877
SLOVENIA	8.8	10.2	39.4	65.2	30.9	18325
CYPRUS	0.0	10.4	21.4	62.6	23.6	23986
ROMANIA	2.9	6.7	40.3	67.7	29.4	5068
BULGARIA	5.9	6.1	39.2	62.3	28.4	4136
CROATIA	2.9	11.3	48.0	65.0	31.8	10161

Note: (*) Trade Composite Indicator is calculated as the simple average of the first four columns; (+) In constant dolars.

Source: Datacomex, Comtrade, WDI and own elaboration.

5. CONCLUSIONS

The negotiations of a free trade agreement between the EU and the US, the so-called TTIP, have prompted a heated debate about its impact on both sides of the Atlantic. Although much praised at the highest official levels for its expected positive effects on both economies, there is an ongoing debate about not only their magnitude, but also their distribution. After revising some of the most relevant reports on the issue, our conclusion is that, at least from the European side, the global impact of the TTIP seems to be rather limited, but positive, as well as unevenly distributed among sectors.

However, neither the reports assessing the TTIP for the whole EU nor those devoted to the same analysis at the country level pay any attention to the potential impact of the TTIP for each single EU country.[24] This is, indeed, a serious limitation of these reports, as it is highly likely that this impact will vary greatly across them. This paper constitutes a preliminary attempt to ex-ante assess, admittedly at a very general qualitative level and just paying attention to the trade side of it, the impact of the TTIP agreement at country level.

In our view, two main conclusions emerge from the analysis. First, the extent and composition of the bilateral trade between each one of the EU countries and the US varies substantially; accordingly, the impact of the TTIP (both on the extent and the composition of their foreign trade with the US) will differ by country. Secondly, the most developed countries tend to be those that, potentially, will undergo a higher increase in their trade with the US. Taking these two conclusions together, and assuming a positive relationship between trade openness and economic growth, a third conclusion emerges: There is high likelihood that the TTIP will provoke an increase in cross-country disparities in Europe.

Whether this negative effect will be more than offset by the expected positive effect of the TTIP at the EU-wide level or by other effects[25] is unknown. In any case, the conventional trade-off between efficiency (EU-wide GDP growth) and equity (distribution of GDP growth) is, once again, at stake. Therefore, and to prevent the expected increase on cross-country disparities, we think that policy strategies carried out at different scales should go, hand in hand, with the implementation of the TTIP. In fact, the TTIP –along with the negative effects of the recent economic crisis- could be a good excuse to strengthen cohesion policy in the EU. In which direction? Although there is a great debate about this, we think that a combination of actions addressed to both reinforce public capital in the less developed EU countries and provide direct help to the investment initiatives of their private business would be the best option.

[24] It is convenient to note that the BMWT/Ifo report (Felbermayr *et al.*, 2013b) also makes an analysis at country level, but only for a sample of countries.

[25] We are mainly thinking about the effects related to the "investment" side of the agreement.

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Appendix.

Table A.1. Trade indicators (pre-crisis and crisis)

Countries	TO		TS		TD (X)		TD (M)		IIT		TC (X)		TC (M)	
	Pre-crisis	Crisis	Pre-crisis	Crisis	Pre-crisis	Crisis	Pre-crisis	Crisis	Pre-crisis	Crisis	Pre-crisis	Crisis	Pre-crisis	Crisis
FRANCE	44.7	44.2	6.4	5.2	6.9	9.3	6.0	9.0	74.8	74.0	67.6	63.9	76.3	73.2
BELGIUM	165.1	171.9	6.2	5.8	13.1	6.3	15.0	8.5	62.1	73.3	63.9	63.7	63.0	66.5
LUXEM-BOURG	105.7	84.2	2.8	3.9	17.0	27.0	21.9	27.5	33.9	23.5	52.1	53.8	63.0	64.9
NETHER-LANDS	110.8	135.8	6.1	5.0	4.7	6.8	7.2	5.2	52.9	59.1	65.4	67.8	67.3	64.1
GERMANY	59.8	69.3	7.4	5.9	11.2	6.2	10.3	5.7	59.0	57.4	66.4	64.6	75.2	75.9
ITALY	41.7	45.2	6.0	4.8	4.4	5.6	4.3	5.6	47.3	47.4	63.6	63.4	65.8	70.3
U. KING-DOM	38.1	42.0	11.9	9.6	6.5	5.7	7.4	6.6	68.6	66.0	76.7	71.2	73.8	73.9
IRELAND	91.0	77.4	16.6	18.3	20.2	9.3	21.2	11.5	47.7	30.7	41.7	36.7	73.0	67.9
DENMARK	60.2	60.2	4.7	4.5	6.9	6.8	12.5	6.4	47.9	39.7	59.8	60.4	71.4	72.0
GREECE	30.3	35.2	3.7	2.6	7.2	13.1	15.3	9.2	30.3	40.8	52.9	57.6	66.9	58.5
PORTUGAL	52.1	57.0	3.5	2.5	8.5	6.3	10.5	5.5	40.1	36.9	66.1	65.3	67.4	69.3
SPAIN	42.4	43.9	3.6	3.5	4.2	4.4	6.5	6.9	61.6	63.1	65.6	66.7	68.8	70.4
SWEDEN	61.2	61.4	7.3	4.8	8.7	6.7	6.2	5.8	45.8	48.0	63.8	67.5	72.3	74.9
FINLAND	61.7	57.5	5.4	4.1	9.7	6.7	7.9	5.1	43.4	40.0	49.7	53.4	71.3	68.2
AUSTRIA	78.6	81.9	3.9	3.2	7.5	9.8	6.5	15.0	57.1	42.0	66.1	62.3	72.4	75.1

ESTONIA	131.4	129.1	2.6	2.6	25.9	6.3	36.5	6.3	28.0	25.2	61.3	66.6	69.5	67.9
LITHUANIA	99.4	128.5	2.9	1.9	20.7	8.6	44.7	14.0	21.8	16.1	61.9	64.9	63.3	62.0
MALTA	112.1	104.9	11.7	4.5	66.0	28.6	44.4	21.8	55.3	14.8	39.0	49.2	64.0	55.9
LATVIA	75.4	93.5	1.8	0.9	8.7	5.3	9.1	5.0	26.8	44.2	48.3	57.5	64.0	65.7
POLAND	60.9	74.3	2.1	1.8	4.4	5.3	6.9	6.3	54.3	69.2	65.0	66.6	71.6	75.7
CZECH REP.	113.6	134.6	2.3	1.7	5.6	6.2	6.5	6.6	68.1	62.7	68.7	66.4	76.9	73.1
SLOVAKIA	109.5	155.9	2.0	1.1	42.5	6.0	34.0	8.6	23.9	26.4	68.8	63.5	70.2	71.1
HUGARY	121.3	146.1	2.8	2.0	13.0	9.7	11.8	9.6	55.1	55.9	67.3	66.1	74.2	70.2
SLOVENIA	106.3	130.6	2.1	1.5	10.8	5.6	9.2	25.4	43.2	32.7	61.5	59.5	67.5	71.1
CYPRUS	42.0	38.1	3.0	1.7	7.1	7.4	27.2	6.9	10.9	26.3	63.6	59.5	59.6	61.1
ROMANIA	67.6	69.3	2.7	1.4	9.1	5.3	8.6	7.5	27.8	41.6	57.2	62.4	68.1	73.7
BULGARIA	98.6	103.7	2.7	1.1	10.5	6.0	6.0	5.9	24.5	52.7	55.2	62.5	60.8	65.0
CROATIA	60.5	58.2	2.4	2.2	19.9	6.1	16.3	5.9	45.7	48.2	61.4	61.4	67.5	66.2
Dispersion statistics														
D9	115.9	138.9	8.7	5.8	22.2	10.8	34.8	17.1	63.9	67.0	67.9	66.9	74.5	75.0
D1	41.9	43.4	2.1	1.3	4.6	5.3	6.2	5.4	24.3	24.7	49.3	53.7	63.0	61.7
ratio D9/ D1	2.8	3.2	4.1	4.3	4.8	2.0	5.6	3.1	2.6	2.7	1.4	1.2	1.2	1.2
CV	0.4	0.5	0.7	0.9	1.0	0.7	0.8	0.6	0.4	0.4	0.1	0.1	0.1	0.1

Note: D1 and D9 denote first and last deciles, respectively. CV refers to the coefficient of variation.

Source: Datacomex, Comtrade, WDI and own elaboration