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FREE MARKET ACCESS FOR LDCs UNDER THE EBA INITIATIVE. AN EMPIRICAL ANALYSIS USING THE GRAVITY APPROACH

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Free market access for LDCs under the EBA initiative. An empirical analysis using the gravity approach•

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Abstract This paper assesses the effectiveness of the Everything But Arms (EBA) initiative launched by the EU in 2001. It evaluates whether EBA was effective in increasing the exports from LDCs to the EU over the period 1995-2006. After arguing that the impact of trade preferences should be estimated by using disaggregated trade flows rather than aggregated trade, the analysis is carried out by considering five products (cloves, coffee, crustaceans, molluscs and vanilla beans) which meet three selecting criteria related to the export intensity of EBA countries, to the real/actual preferences of EBA and to the intra-year distribution of EU tariffs. Furthermore, the exports share of the 5-selected goods with respect to national exports is never marginal and, in many cases, is higher than 60%. From an econometric perspective, we improve the reliability of results by giving more attention to the econometric setting and to measurement of the preferential treatment. The evidence is mixed and while this limits the possibility to draw a general conclusion about the role of EBA, it supports the decision to work using disaggregated data because the evidence provided allows us to gauge the sector specificities which would be hidden when analysing total trade. Results show a positive impact on the exports of crustaceans and vanilla of the preferential treatment granted by the EU under EBA, whereas the evidence is un-conclusive when considering the other three products,

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1. Introduction

As trade is widely recognised to be an engine of growth, developed countries have implemented a patchwork of trade agreements under which preferential treatment is granted to products from developing countries (DC). It is expected that trade preferences determine an increase in exports from preference-receiving countries to the market of preference-donor countries vis-à-vis other suppliers. The EU, with its high number of trade preferential arrangements signed with DC, is firmly committed to the promotion of open and fair trade

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with virtually all DC and, through its trade cooperation policy, aims to make a meaningful contribution to stimulating export-led strategies in DC. One important scheme which was adopted by the EU in order to offer preferential access to DC is the Generalised System of Preferences (GSP). This dates back to the early '70s when the United Nations Conference on Trade and Development (UNCTAD) recommended the creation of a 'Generalised System of Tariff Preferences' to be implemented by each industrialised country. The EU's GSP was adopted in 1971 for a period of ten years and has been renewed several times, with revisions involving the number of GSP arrangements and the products and countries covered, as well as the tariff cuts for each product. The current GSP, which was renewed in 2008 for a three-year period, comprises three arrangements: the ordinary GSP, the GSP plus and a special agreement for Least Developed Countries (LDCs). While only non-sensitive products enter the EU duty-free under the ordinary GSP and additional benefits are granted to countries implementing certain international standards of human and labour rights, environmental protection, good governance and the fight against drugs under GSP plus, the special arrangement in favour of LDCs provides tariff free and quota free access to all EU imports from 49 LDCs, except arms and ammunition. This is the reason why the agreement is known as EBA, Everything But Arms.[1] Besides the comprehensive product-coverage of this new initiative, another difference with respect to ordinary GSP and the GSP plus is that it will be maintained for an unlimited period of time and will not be subject to the periodic renewal of the Community's scheme of generalized preferences (Council Regulation EC No 2501/2001).

EBA was launched by EU in 2001 and its ultimate goal is to boost LDC growth by removing all trade restrictions when they export to the EU market. However, even though EBA provides the maximum market access for LDC exports, its effectiveness is not assured for several reasons. Some of these reasons, such as the weak supply capacity of LDCs or the weak institutional capacity of LDCs to effectively administer the EU tariff structures, are external to EBA while others, like the strict Rules of Origin (RoO) are internal to the new EU initiative. Again, granting full market access does not necessarily translate into increased exports from all EBA countries because of trade arrangements which pre-existed EBA. For instance, the 36 EBA countries which are also part of the Cotonou agreement prefer to export under the Cotonou agreement rather than under EBA. This is for two reasons. The first is that EBA does not introduce particular improvements regarding entry into the EU market with respect to the

[1] Under EBA, the removal of import duties was delayed until 2006 for bananas and 2009 for rice and sugar.

Cotonou agreement because tariffs faced by ACPs were already very low or even zero for a large amount of commodities. In other words, many products exported by ACPs did no gain any additional tariff preference from the new initiative: they already enjoyed duty-free or quota-free entry into the EU. The same reasoning may be made for those EBA countries which already enjoyed duty-free access to EU under the ordinary GSP when exporting non-sensitive products before 2001. The second reason refers to the evidence that the RoO of the arrangement signed by ACPs are far less restrictive than those under EBA. This would make the use of EBA preferences more difficult and costly than the recourse to other preferential treatment (i.e, Brenton 2003; UNCTAD 2003).

All these considerations, however, do not necessarily mean that EBA is uneffective in encouraging LDC exports to the EU. This remains an open question which will be addressed throughout this paper. One method of evaluating whether a preferential treatment encourges the exports of preferred countries is the gravity equation. This model, in its basic form, posits the idea that trade is positively affected by the economic mass of the trading countries, which is gauged by their GDP and population, and negatively influenced by the geographical distance between them. The appeal of the gravity equation derives from the opportunity it offers for modelling deviations from the normal pattern of trade, where normal is simply meant to be the trade determined by the variables usually referred to as gravitational variables (GDP, population and distance) in the absence of any other disturbance. Deviations from the normal level of trade are captured by augmenting the model with all the factors that may hinder or favour bilateral trade flow, such as a common border, language, past colonial ties and religion. Preferential trade policies certainly belong to this kind of factor because they entail unilateral reductions in trade barriers granted by developed to DC. Hence, other things being equal, they are expected to stimulate exports from DC to the preference-giving country, so yielding a higher flow of trade than that which would "normally" be expected.

The literature which aims at explicitly analysing the impact of EBA by using the gravity approach is rather limited in quantity. It is comprised of the papers by Pishbahar and Huchet-Bourdon (2008), Persson (2008) and Gradeva and Martinez-Zarzoso (2009). These studies share the use of aggregated data, i.e. total exports from LDCs to the EU, and the use of a dummy variable as proxy for the preferential policy (this dummy is 1 if the country benefits from EBA and 0 otherwise). From an econometric point of view, Pishbahar and Huchet-Bourdon (2008) use the OLS estimator, while Persson (2008) and Gradeva and Martinez-

Zarzoso (2009) consider the Heckman (1978) procedure in order to control for selection bias due to zero trade flows. These three works show that EBA is not effective in increasing LDC exports to the EU.

The aim of this paper is to provide further evidence in this field of research by attempting to improve the reliability of results obtained when evaluating the effectiveness of EBA within the analytical framework of the gravity approach. To this end, the empirical setting looks at three key issues regarding the use of disaggregated data of trade flows, the measurement of trade preferences and the econometric estimators to be employed.

With regards the data aggregation on which the evaluation of EBA effectiveness ought to be based, we argue that, in general, the use of total exports is not adequate for evaluating the impact of a trade policy instrument – the preferential trade preference - which is conceived of as being applied at product level (see, among many others, Agostino et al. 2009). Indeed, the main objective of any Preferential Trade Agreement (PTA) such as EBA is to alter the incentives for beneficiaries to export more in specific sectors (those in which preferences are granted). This implies that the correct empirical strategy to follow in evaluating the effectiveness of EBA is to use trade statistics at a very high level of data disaggregation. This has two advantages. On one hand, it allows us to understand whether and to what extent the preferential treatment granted by the EU to LDCs through EBA enhances the exports of each tariff-triggered product. In this respect, if EBA treatment induces an increase in exports in each sector, the evaluation of the effectiveness of the scheme will be positive, even if the exports of EBA countries do not change at national level. Of course, the impact on national exports is the sum of the impacts revealed at product level and the more products eligible for EBA preferential are the greater the effect should be on total exports. On the other hand, the evidence based on disaggregated data does not suffer from the shortcomings relating to the aggregation of tariffs, which, on the contrary, restrict the reliability of results obtained when the gravity equation is estimated using trade flows at national level (Cipollina and Salvatici, 2008; Anderson and Neary, 2005). As a study cannot analyse all the products, given that the amount of data to be elaborated would be enormous (in 2009 EBA covered 7140 HS10-digit products), a selection of products must be made. In this paper, we focus on a group of products which have been selected after having satisfied three conditions . The first condition refers to the export capability of EBA countries before 2001. The rationale underlying this hypothesis is that, when no radical change in the production and export structure of EBAs

occurs in the very short run, a total removal of tariffs determines an effect which can only be picked up in the empirical analysis if the preferred countries were able to export before EBA. Therefore, we classify all HS4-digit EBA goods by their exports share of the world market in 2000, that is before EBA was in force. The second condition is that GSP tariffs applied by the EU to its imports are positive. This ensures that EBA introduces a real gain, in terms of tariff preferences, for all exports from LDCs to the EU market. The idea of the criterion is that it would be pointless to evaluate EBA by considering individual products with respect to which the EU already guarantees free access under GSP. Finally, we exclude from the study the products with intra-year variability of tariffs because, in such a case, one has to use monthly data on exports and tariffs. This would require the addressing of the issue of seasonality (Cardamone, 2009) which is hard to deal with when the monthly time series reports many missing values, as is the case with a number of LDC exports.

The HS-8 level products which satisfied the above mentioned three conditions are cloves, vanilla beans, coffee, crustaceans and molluscs. Bearing in mind that we are analysing the most vulnerable countries in the world, it is extremely important to point out that many EBAs heavily depend on the exports of these five products. For instance, in 2006, exports of coffee accounted for 40,85% of Ethiopia's total exports, about 35% of Rwanda's total exports and 16% of Burundi's total exports. At the same time, the exports of crustaceans made up 21,2% of Madagascar's total exports and 3,81% of Mozambique's total exports. In 2006, molluscs represented 4.3% of the total exports of Senegal, the exports of cloves were 4.2% of Bangladesh's total exports and the exports of vanilla made up about 5% of Madagascar's total exports. Even though we are limiting the analysis to a very restricted sample of products, these figures allow us to say that the selected commodities are really important for each individual country. Given that the shares of each product are not marginal, any increase in its exports surely has an impacts on the total exports and if the increase can be attributed to preferential treatment under EBA, then it will be possible to say that the scheme is pro-development.

Considering the literature which analyses the role of EBA by using the gravity model, the second innovation of this paper regards the variable used to measure the trade preferences granted by the EU under different arrangements (EBA, GSP, Cotonou, regional trade Agreements). The proxy for preferential treatment that we consider is the margin of preferences, rather than the dummy variables. Due to data availability, this approach is

becoming more popular in this field of research (see, i.e., Cardamone 2009; Emlinger et al., 2009). The margin of preference is measured by the difference between the MFN duty and the preferential tariff granted under each specific trade arrangement and, therefore, is an explicit measure of the preferential treatment which overcomes the two main caveats of dummies. The first caveat is that dummies cannot discern between different preferential trade policy instruments (preferential tariff margins, preferential quotas, reduced entry prices), while the second limitation is that dummies do not measure the level of trade preferences (i.e., if we had considered dummies, we would have assumed that the level of trade preferences under EBA would be the same as those under the Euro-Mediterranean or Cotonou Agreements).

Finally, the third distinguishing feature of the study regards the econometric methods used in estimating the gravity model. The methods employed control for heterogeneity, endogeneity and selection bias. While a heterogeneity bias might be due to the likely correlation between specific country-pair fixed effects and regressors, endogeneity could arise because of the simultaneity between the dependent variable (EU imports) and the regressors, Hence, before using a fixed effect estimator, we first perform the Davidson-Mackinnon test, the results of which suggest that the hypothesis of endogeneity of PTA variables may be rejected. As a consequence of this, we adopt a negative binomial model which, as the Poisson model also does, controls for selection and heteroskedasticity biases (Santos Silva and Tenreyro, 2006), but relaxes the heavily restrictive assumption regarding the identical mean and variance of the Poisson distribution.

We find mixed evidence with regards the results. When considering the group of EBA which are also part of the Cotonou agreement, we find that during the years of the application of the new initiative, the exports of vanilla and crustaceans have been positively influenced by the trade preferences granted by the EU. The same applies for the exports of crustaceans from the EBA countries which did not sign the Cotonou arrangement. Un-conclusive or unsatisfactory outcomes were found in the remaining cases.

The paper is organised as follows. Section 2 presents a descriptive analysis of LDC exports, section 3 introduces the gravity model and the estimation methods, while section 4 discusses the estimated results. Finally, section 5 concludes.

2. The exports of EBA to EU: a brief descriptive analysis

After the introduction of EBA, LDCs were expected to react to the new incentives by increasing, *ceteris paribus*, their market shares in EU markets. This expectation is based on the fact that, under EBA all products from LCDs, except arms and ammunitions, have enjoyed duty and quota free access to the EU market (with the exception of bananas, sugar and rice for a limited period). With respect to other exporters, EBA countries would improve their competitive position in EU markets because they would get higher prices in a protected market and this should have a positive impact on LDCs' incentive to export to the EU. Moreover, EBA is granted for an unlimited period, without periodical renewals, and this is a source of certainty which may help strengthen the trade relationships between LDCs and EU.

Table 1 presents EBA market shares regarding three levels of data aggregation (total exports, total agricultural trade and 29 HS2-digit products) for the EU as a whole, over the period 1998-2007.

With regards EBAs' total exports, what clearly emerges is that the market shares showed an increasing trend from 1998 to 2005, with a substantial shift in 2002, while, more recently (2005-2007), they were stable around a value of 0.18%. On one hand, this evidence suggests that, as expected, the market shares of EBA have remained very low, but, on the other hand, we find that the relative importance of EBAs as suppliers to the EU-27 market registered a substantial increase over the period under scrutiny: the 2007 market share was 0.184%, that is to say fivefold that of 1998 (0.038%). The increase in the market share was similar when only considering agricultural imports. In this respect, EBAs' shares were higher than those regarding total trade, and this fact indicates the more relevant role of EBA within the EU agricultural market: these market shares were 0.089% in 1998, 0.16% in 1999 and increased by 0.4%, on average, over the period 2000-2007 (table 1).

A look at the 2-digit agricultural data reveals that the resulting picture is extremely confused, in the sense that only seven categories of products (cereals, cereal-flour-starch-milk preparation and products, cocoa, live trees, edible vegetables, tobacco, edible fruit-nuts-peel of citrus-melons) registered a clear increase in market shares following 2001. Market shares declined for other sectors (animal and vegetables fats, residual-wastes of food industry-animal

fodder, vegetables-fruit-nut, meat, meat-fish- and seafood preparations, lac-gums-resins-vegetable saps and extracts), while no clear pattern emerges for the remaining sectors (milling products, sugar and sugar preparations, and live animals) (table 1).

Although this examination may help understand the overall changes which have occurred in the relative capacity of EBAs to enter the EU market, it does not lead to any conclusion regarding the role of EBA. This is also because the HS2-digit level of data aggregation we consider in table 1 is still too wide, in the sense that each group is composed of a large number of products, which are, in many ways, very different from each other. The main difference we refer to regards the extent of trade barriers that EBA countries have enjoyed in exporting to the EU. Since tariffs are established at a very detailed level of data aggregation (trade restrictions are established by the EU at HS-10 digit level), the 2-digit trade statistics of table 1 may hide product-specific behaviour which we are interested in when evaluating the potential role of EBA. Again, we know that the EBA coverage in terms of preferential treatment is at the maximum level (all goods, except for arms and ammunitions, have un-limited access to the EU), but there is a great difference within each 2-digit agricultural sector when comparing EBA with GSP and ACP tariffs. Indeed, as already mentioned, the effective tariff gain associated with EBA only exists if the preferential tariffs applied under other trade agreements are positive, and this can occur to a very different extent from one product to another product even when they belong to the same sector.

Based on these arguments, we identified a sample of products at the HS-8 level of aggregation as the group of commodities on which the following empirical analyses is based. The selection was made by imposing three conditions which refer to the export intensity of EBAs at HS4 digit level, the "size" of the preferential treatment given by EBA and the absence of intra-year variability of EU import tariffs.

As for export intensity, we order the products at HS4 digit level in terms of EBA share of world exports in 2000. This ranking allows us to indentify a list of commodities, with respect to which LDCs exhibited a certain degree of market competitiveness before EBA came into force in 2001. After ordering the 4-digit products according to market share, the second criterion of selection is meant to identify the products which received a effective tariff advantage from EBA with respect to the pre-existing trade arrangements. In this sense, we restrict the sample to goods with a positive preferential tariff under the ordinary GSP regime,

the most general, world-wide preferential scheme implemented by the EU. Finally, in order to avoid all the empirical issues relating to the use of monthly data (for instance those due to the large amount of missing values, the size of the dataset and seasonality), we remove all the commodities with a tariff calendar.

Considering the 15 groups of products with a world market share above 3% in 2000, the selection yields, at HS4-digit level, a sample composed of the following five products: cloves, vanilla beans, coffee, crustaceans and molluscs. Table 2 presents the three kinds of information used for selecting the five commodities. The data displayed shows that the selected sample of products includes certain goods whose world market is largely dominated by exports from EBA countries (EBA market share is 72% in the case of cloves and 65% for vanilla beans), while the other three products have a market share of around 4% (coffee and molluscs) or 5% (crustaceans) (table 2).[2]

For each selected good, figures 1 and 2 show the absolute values and the market shares of EBA exports to the EU over the period 1995-2006. The five selected products exhibit very different patterns. For instance, total EU imports of cloves and vanilla from LDCs increased greatly immediately after 2000, but they suffered a sharp reduction in 2001 and 2003, respectively. However, with respect to total EU clove imports, those from LDCs decreased, on average, over the period 1995-2006, while LDC export-shares of vanilla beans alternated between decreasing and increasing annual changes (an average share of around 0.7%). With regards coffee, the time-series of EU imports from LDCs (both in absolute and relative terms) was fairly stable, except for an unusual annual change between 1999 and 2000. Finally, EU imports of molluscs and crustaceans from LDCs increased up until 2000 and decreased respectively after 2002 and 2003.The same applies for their export-shares (figures 1 and 2).

Another important issue to be addressed concerns the level of tariffs that countries face when exporting the 5-sample products to the EU market. Figures 3-7 display the level of import tariffs under the four main EU preferential trade agreements, namely the ordinary GSP, the

[2] Data from table 2 indicate that some products (ground-nut oil, copra, lac and gums, oil seed and live sheep) have been excluded because they have tariff free access to the EU under GSP, while other products (nuts, peel of citrus and leguminous vegetables) have been kept out because they are subject to tariff seasonality.

preferential tariffs granted to ACPs, the EBA and the average tariffs of Regional Trade Agreements (henceforth RTA) signed by the EU.

The first conclusion is that GSP duties are higher than those applied under the other preferential schemes (EBA, Cotonou and RTA), whatever the product. While this is the result of the tariff-triggered criterion we used in selecting the products, it is also a measure of the relative tariff advantage that LDCs would enjoy if they exported under the EBA regime instead of reverting to GSP. Other evidence regards the fact that the duties levied on EU imports from ACPs are zero for the five products concerned. This fact gives further interest to the analysis because the group of EBAs can be split into two sub-samples. The first sub-sample comprises the 13 LDCs not belonging to the Cotonou agreement.[3] Before 2001 the exports from these 13 LDCs towards the EU market were levied according to the positive GSP-tariffs and, thus, the new free market access under EBA increased their competitiveness in the EU (we label these countries as $13EBA_{not\text{-}ACP}$). The second sub-sample is composed of the 36 EBA countries which were also part of the Cotonou Agreement (henceforth $36EBA_{ACP}$).[4] What emerges is that when exporting the 5-selected products to the EU, the $36EBA_{ACP}$ did not obtain any tariff advantage from the new scheme, and this is the opposite of what happened to the $13EBA_{not\text{-}ACP}$ which moved from a regime of positive GSP-tariffs to the tariff-free and quota-free access of EBA. The main lesson that can be learnt from figures 3-7 is that, as far as the five selected sectors are concerned, the $36EBA_{ACP}$ did not enjoy any tariff advantage with EBA with respect to their previous status and, in this respect, it is reasonable to argue that their capacity to enter EU market did not change because of the new preferential agreement. At the same time, it is likely that EBA exerts a certain influence in favour of the $13EBA_{not\text{-}ACP}$ because the import tariffs they currently face are zero, i.e. less than the GSP duties they would have to pay without the EBA initiative.

[3] Afghanistan, Bangladesh, Bhutan, Cambodia, Djibouti, Kiribati, Lao People's Dem. Rep. Maldives, Nepal, Solomon Islands, Yemen, Timor Leste, Samoa.

[4] Angola , Benin, Burkina Faso, Burundi, Cape-Verde, Central African Republic, Chad, Comoros, Congo Dem. Rep, Equatorial-Guinea , Eritrea, Ethiopia, Gambia, Guinea, Guinea Bissau, Haiti, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, Sao' Tomé and Principe, Senegal, Sierra Leone, Solomon Islands, Somalia, Sudan, Tanzania, Togo, Tuvalu, Uganda, Vanuatu, Zambia. The EEC and the ACP countries signed their first agreement in 1969 during the Yaoundé Convention. In 1975, the Yaoundé agreement was replaced by the Lomé Convention, followed by the Cotonou Partnership Agreement in 2000. The latter agreement was replaced by the Economic Partnership Agreement (EPA) in 2008.

As for the single individual products, we find that in the cases of vanilla, coffee and cloves (except for 2000), there was no substantial difference between EBA (or ACP) and RTA tariffs (all of them were around zero). Finally, with regards the exports of molluscs and crustaceans, EBA attributed an effective tariff advantage with respect to the developing countries which had signed an RTA.

3. Empirical setting: the gravity model and the estimation methods

In order to assess the effectiveness of the EBA initiative, we estimate the following multiplicative gravity equations over the period 1995-2006:

$$X_{ijt}^{s} = (GDP/POP)_{it}^{\alpha_1} \cdot (GDP/POP)_{jt}^{\alpha_2} \cdot (POP_{it})^{\alpha_3} \cdot (POP_{jt})^{\alpha_4} \cdot \exp(\alpha + \alpha_t + \alpha_{ij}^{s} + u_{ijt}^{s} + \delta_1 MTR_{it} + \delta_2 MTR_{jt} + \beta_1 GSP_{jt}^{s} + \beta_2 ACP_{jt}^{s} + \beta_3 RTA_{jt}^{s} + \beta_4 13EBA_{NonACP,jt}^{s,pre2001} + \beta_5 13EBA_{NonACP,jt}^{s,post2001} + \beta_6 36EBA_{ACP,jt}^{s,pre2001} + \beta_7 36EBA_{ACP,jt}^{s,post2001}) \quad [1]$$

where subscript *i* refers to the individual EU-15 importers (i=1,...,15), *j* to exporters (j=1,...191), *t* to the year (t=1995,...,2006), and *s* indicates the agricultural commodities, at HS8-digit level, which are included in the five groups of products we select at HS4-digit agricultural level,[5] X is the EU's import flow, GDP is the Gross Domestic Product, POP is the population. α^{s}_{ij} indicates the commodity-country pair fixed effects, while u^{s}_{ijt} is the error term.[6] The acronym MTR stands for Multilateral Trade Resistance and are meant to measure trade barriers that each country faces with respect to all its trading partners. As suggested by Anderson and van Wincoop (2003), bilateral trade should be higher between trading countries with relatively low trade barriers. We determine a proxy of multilateral trade resistance, following the approach proposed by Carrere et al. (2009), which extends the multilateral resistance approximation used by Baier and Bergstrand (2009) to a panel framework. MTR terms for country *i* and country *j* are defined as $MTR_{it} = \sum_{k} \frac{GDP_{kt}}{GDP_{Wt}} \ln(DIST_{ik})$ and

[5] There is just one commodity at HS8-digit level within the HS4-digit of cloves and vanilla beans, while there are seven at HS8-digit level within the HS4-digit of coffee, thirty-one in the group of crustaceans and, finally, thirty-two products in the aggregation of molluscs.

[6] The gravity model specification used does not incorporate the country-pair background based on observable factors (distance, common border, common language, the number of landlocked countries in the pair, or past colonial ties) which can be handled using a set of dummy variables. This exclusion is due to the fact that the dummies relating to the above mentioned variables are time invariant and, thus, will be dropped from the estimation when the country fixed effects are supposed to be the pair of trading countries (see below on this point).

$MTR_{jt} = \sum_{k} \frac{GDP_{kt}}{GDP_{Wt}} \ln\left(DIST_{jk}\right)$, where W is the world, i, j, k indicate the individual countries, t is time, GDP represents the Gross Domestic Product, $DIST_{ik}$ ($DIST_{jk}$) is the distance in km between the capitals of country *i* (*j*) and country *k*.

The GSP variable is the preferential margin granted by the EU to the imports of the s-*th* product from the developing countries eligible for GSP treatment only. In other words, GSP regards a sample of countries net of LDCs. Similarly, the ACP variable represents the margin of trade preference in favour of the group of countries which signed the Cotonou agreement only. The RTA variable indicates the margin of preference granted in favour of developing countries which signed bilateral trade agreements with the EU.[7]

The procedure used to define the variables GSP, ACP and RTA leaves out the LDCs which we split into two sub-samples on the basis of whether they are eligible or not for the Cotonou agreement (see § 2). Furthermore, for each of these two groups of countries, we consider the preferential treatment received before and after the implementation of EBA, i.e. before and after 2001. Thus, for instance, the variable $13EBA_{not-ACP}^{pre-2001}$ in eq. [1] indicates the margin of preference enjoyed up to 2001 by the group of the 13LDCs which did not sign the Cotonou (see footnote 3). By extension, the meanings of $13EBA_{not-ACP}^{post-2001}$, $36EBA_{ACP}^{pre-2001}$ and $36EBA_{ACP}^{post-2001}$ are clear.

For each preferential variable (GSP, ACP, EBA and RTA) and each tariff-line, we compute the preferential margin as the difference between the MFN duty and the preferential duty granted under any specific trade arrangement. Finally, in defining the margins of trade preferences, we address the overlapping of preferences by assuming that if a country benefits from GSP and ACP agreements, the trade flows enter the EU market under the ACP regime. Similarly, if a country benefits from GSP and RTA, then we assume that the imports enter the EU market under RTA. These choices are based on two arguments. The first refers to the fact that, for the five products considered in this paper, GSP tariffs are generally higher than the

[7] The agreements included in the analysis are those with Albania, Algeria, Andorra, Bosnia Herzegovina, Bulgaria, Chile, Croatia, Cyprus, Czech Republic, Egypt, Estonia, Hungary, Iceland, Israel, Jordan, Latvia, Lebanon, Libya, Lithuania, Macedonia, Mexico, Morocco, Norway, Palestinian Authority, Poland, Romania, Serbia and Montenegro, Slovakia, Slovenia, South Africa, Switzerland , Syria, Tunisia, Turkey.

preferential tariffs established in favour of ACP and RTA countries. The second consideration is that RTA and ACP agreements involve RoO which are much less restrictive than those under GSP. Therefore, exporting countries will prefer not to use the GSP scheme even if the preferential margin is equal to that received with the Cotonou agreement or with a RTA.

Data on EU imports are from COMEXT.[8] Inward processing imports are subtracted from total imports in order to take into account imports entering the EU to be processed and re-exported merely to benefit from tariff exemption. The set of importing countries is comprised of the individual EU-15 member states, while there are 191 exporters, i.e. all the countries for which trade statistics are available. As far as the explanatory variables are concerned, data on GDP and population are from the World Development Indicators 2008. All data regarding values are in constant 2000 Euro. The preferential variables GSP, ACP, RTA and EBA are determined using the dataset DBTAR (Gallezot, 2005) for the period 2001-2004, while for the period 1995-2000 and the years 2005 and 2006, they are calculated by extracting the data on tariffs from TARIC (http://ec.europa.eu/taxation_customs/dds/tarhome_en.htm).

With regards to the methods used to estimate equation [1], it is worth noticing that the results obtained from the estimation of a gravity equation suffer from three main potential sources of bias, which are related to country-pair heterogeneity, endogeneity and the presence of zero trade flows.

Heterogeneity may be due to observable and non-observable factors which are specific to each country-pair. From an econometric perspective, the omission of such factors leads to a mis-specification of the gravity equation, and could produce biased and/or inconsistent estimates. To control for country-pair individual effects, we have included in the gravity equation a set of commodity-country pair fixed effects (α_{ij}^{s}) derived from the following decomposition of the error term: $\varepsilon_{ijt}^{s} = \alpha_t + \alpha_{ij}^{s} + u_{ijt}^{s}$ (see eq. 1).

[8] The Comext dataset provides data expressed in CIF value. Thus, in order to transform data to FOB, we compute the CIF/FOB ratio and follow the IMF Direction of Trade Statistics (DOTS) procedure. For this calculation, data are from Comtrade and given that this source provides yearly data at HS6 level, we assume that CIF/FOB ratios do not differ if we move from HS6 to HS8 commodity lines.

The endogeneity issue is related to the fact that PTA variables could be simultaneously determined through trade flows. In fact, it is not unanimously agreed whether countries trade more because they are in a PTA or that they participate in a PTA because they already traded relatively more with each other than with other countries. Thus, we perform the Davidson-Mackinnon (DM) endogeneity test, which compares OLS and IV estimations in a panel framework.[9] As can be seen from table 3, the p-values of the DM test allow us to reject the hypothesis of endogeneity of the preferential variables in all estimations.

With regards zero trade flows, we take into account the arguments put forward by Santos Silva and Tenreyro (2006) according to which a multiplicative gravity specification is more appropriate than a log-linear one. These authors show that the log-linearisation of the gravity equation changes the "properties of the error term in a nontrivial way" (Santos Silva and Tenreyro, 2006: 644) because the error terms of the original multiplicative specification are heteroskedastic. This bias violates the statistical independence between the error term and the independent variables and leads to inconsistent estimates (see also Westerlund and Wilhelmsson 2006). Hence, Santos Silva and Tenreyro (2006) supported the choice of the multiplicative specification of the gravity model and employed a Poisson model. We, instead, use the negative binomial model with fixed effects because the Poisson model assumes equal mean and variance of the dependent variable whereas the negative binomial model allows the likely over-dispersion in trade flow observations to be taken into account.

4. Estimation Results

Table 2 presents the results obtained by estimating eq. (1) through the negative binomial estimator. As for the impact of population, it has been argued that larger countries trade more and, thus, the coefficients related to population are expected to be positive. However, if an exporter is large in terms of population, it may need its production to satisfy domestic demand, so that it exports less (Oguledo and Macphee, 1994). On the other hand, it may

[9] In performing this test we consider just one preferential variable which includes all preferential schemes. To define this preferential variable, we address the issue of overlapping as follows: if a country benefits from GSP and EBA, the latter is the scheme considered. If a country benefits from GSP and ACP or GSP and RTA, then ACP and RTA are the agreements considered in the computation, respectively. The logarithm of aid received by the exporting country is the variable used to instrument the preferential variable. We have verified that the endogenous variable is highly correlated with the instrument, even after sifting out the other exogenous variables in the equation, in order to meet the "order conditions" (Wooldridge, 2006).

export more than a small country, as is the case when large firms achieve economies of scale. The same reasoning can be applied to the case of the importing country: if large, it may either import less because it is likely that the domestic sector finds it profitable to develop and make the country self-sufficient, or it may import more because it cannot satisfy all domestic demand with its own production (Pusterla, 2007). We find that the population of exporters has a positive impact on imports of vanilla beans, crustaceans and molluscs, while the population of EU importers always has a positive and significant effect on imports. The GDP per capita of exporters has a positive effect on EU imports of coffee, vanilla beans and crustaceans, while the coefficient of importers' GDP per capita is positive in the case of cloves and vanilla beans.

The estimated impact of PTAs on EU imports varies across products. In particular, it is found that the ordinary GSP enhances the exports of vanilla beans, coffee and crustaceans from developing countries to the EU. The trade preferences enjoyed by ACPs are only effective in increasing EU imports of crustaceans, while RTAs have a positive effect on EU imports in every sector (the coefficient is always significant, with the exception of that estimated in the model explaining the EU imports of vanilla beans).

The evidence regarding the effectiveness of EBA is provided by looking at the estimated coefficients of the variables $13EBA_{not-ACP}^{post-2001}$ and $36EBA_{ACP}^{post-2001}$and comparing them with those associated with the variables $13EBA_{not-ACP}^{pre-2001}$and $36EBA_{ACP}^{pre-2001}$. By referring to the general arguments regarding the positive role of the preferential treatment in enhancing the exports of preferred countries, the sign of the parameters β_5 and β_7 is expected to be positive. Furthermore, other being equal, we expect that $\beta_5 > \beta_4$ because, in the case of $13EBA_{not-ACP,}$ the new initiative has introduced a substantial increase on the trade preferences they enjoyed under the ordinary GSP up to 2001. As regards the $36EBA_{ACP}$, we find (see § 2) that when exporting the five-sample products included in the analysis to the EU, they received free market access under the Cotonou agreement too and, thus, we expect no difference between β_6 and β_7.

The study reveals that the impact of EBA is mixed. Let's proceed by pointing out that the variables $13EBA_{not-ACP}^{pre-2001}$ and $36EBA_{ACP}^{post-2001}$ are dropped in three out of five regressions. This is because the $13EBA_{not-ACP}$ did not export cloves, vanilla or coffee to the EU over the period

analysed. Again, no robust result comes from the regression of molluscs. In this case the coefficient of $13EBA_{not-ACP}^{pre-2001}$, namely β_4, is negative but not significant, while the parameter β_5 remains negative (-0.13) and smaller than β_4 after 2001. However, the economic interpretation of β_5 should be made with caution because of the 10% level of significance. As regards crustaceans, we find that the exports from the $13EBA_{not-ACP}$ to the EU was positively affected by the preferential treatment granted by the EU. This holds both for when these countries exported under the ordinary GSP up 2001 (the estimated value of β_4 is 0.06) and when they enjoyed the free market access granted unilaterally by the EU through the EBA initiative (the estimated value of β_5 is 0.04). Thus, in the regression of crustaceans, as β_5 is positive but lower than β_4, we conclude that EBA positively affects the exports from $13EBA_{not-ACP}$ although this impact is lower than that determined by the ordinary GSP before 2001.

As far as the group of $36EBA_{ACP}$ is concerned, results displayed in table 3 indicate that the estimates obtained when explaining the exports of coffee and molluscs are not interpretable because of their low statistical significance, while a negative effect of EBA after 2001 has been found in the case of cloves. Encouraging evidence comes from the regressions of vanilla and crustaceans. It has been found that the trade preferences granted by the EU have been effective in increasing these exports, both before and since 2001. When analysing the exports of vanilla, it emerges that the estimated impact of ACP preferences is β_6=0.25 for before 2001, i.e. when these $36EBA_{ACP}$ countries used the preferences under Cotonou,. The effect of trade preferences increases to β_7=0.41 when considering the years (2001-2006) of EBA application. All this suggests that the preferential treatment granted by the EU in favour of the $36EBA_{ACP}$ determines a substantial positive impact in increasing the exports of vanilla beans towards the EU market and that this impact increases when moving from the years of application of Cotonou to the years of application of EBA. A similar positive impact of trade preferences is obtained when considering the exports of crustaceans from $36EBA_{ACP}$ to the EU. In such a case, the group of $36EBA_{ACP}$ benefits from the trade preferences received both during the years of application of Cotonou (β_6=0.05) and when EBA is into force (β_7=0.40).

The evidence shows how results differ from one sector to another. This, on the one hand, limits the possibility to draw a general conclusion about the role of EBA, but, on the other hand, supports the approach followed in this paper of conducting a study using data at product level. Indeed, in such a way, we gauge the sector specificities which, otherwise, would be

hidden when using aggregated trade flows. With regards the estimations, as said above, regressions yield poor results, except for vanilla and crustaceans. This is an unexpected outcome for two reasons, at least. The first is that exports from EBA countries absorbed in 2001 accounted for a substantial world market share and secondly that the tariff gains due to EBA were not marginal for the group $13EBA_{not\text{-}AC}$ (see table 2 and figures 3-7). In a nutshell, EBA did not divert LDC trade from the rest of the world towards the EU, though $13EBA_{not\text{-}AC}$ got a substantial tariff gains in the concerned sectors.

From an econometric perspective, the unexpected evidence obtained for the clove, coffee and mollusc sectors is due to the fact that the array of exports comprises scant observations regarding EBA exports. In other words, the array of the margin of preferences under EBA is composed of a very limited number of positive values or, equivalently, by a massive number of zeros. This makes the estimation procedures very difficult. In brief, EBA exports to the EU were driven by just a few countries which exported to a restricted number of individual EU importers for a limited number of years. By limiting the discussion to the 5-product case studied in this paper, it emerges that there was no radical change in the structure of trade relationships with the EU over the years of application of EBA.[10] We observe that no EBA country became a new exporter to the EU, a fact that could be interpreted as a result, in these sectors, of the new initiative. In addition, EBA countries' world market share in the five analysed sectors tended to diminish, something which may have been due to the role of emerging actors in the world market or/and to the likely tendency within each EBA country to divert production and exports towards other more remunerative sectors. The understanding of these facts lies beyond the scope of this work, but it is likely that they are an explanation of the irrelevant effect of EBA revealed in some of our estimations.

[10] For instance, no country in the $13EBA_{not\text{-}ACP}$ group exported cloves, coffee and vanilla beans to the EU over the period under scrutiny, only one exported molluscs and, finally, only five exported crustaceans. The same applies when considering the $36EBA_{ACP}$. In this case there were just two exporters of cloves and vanilla beans and seven coffee exporting countries. Furthermore, these products were imported by a very restricted number of individual EU15 countries and the relative trade flows existed, at maximum, for four out of twelve years. As for molluscs, there were just seven $36EBA_{not\text{-}ACP}$ which exported to the EU, while crustaceans were exported to the EU by twenty five $36EBA_{not\text{-}ACP}$. Finally, Tanzania only exported vanilla beans to Belgium and, then, just for one year, 2000.

5. Conclusions

This paper assesses the effectiveness of the EBA initiative on the LDC exports of cloves, vanilla beans, coffee, crustaceans and molluscs over the period 1995-2006. The sample of commodities is derived from a selection process based on three conditions concerning the overall export capacity of EBA countries, the existence of an effective tariff gain for LDCs as a result of EBA and the absence of intra-year seasonality in tariff levels.

With respect to the literature dealing with the same issue, the role of EBA, and using the same empirical framework, namely the gravity model, we introduce a few innovations. First of all, in this paper preferential trade policies are measured not by a dummy, but by a preferential margin. Secondly, the paper presents an evaluation obtained by using data disaggregated at HS8 level in order to avoid aggregation bias in calculating an average measure of tariffs and with the aim of better identifying the key trade flow on which the preferential treatment is expected to have an impact. Thirdly, we control for country heterogeneity, endogeneity and selection bias due to zero trade flows. Estimations were made using the negative binomial model.

Results, in some ways, contrast with those obtained in previous works which have unanimously found that EBA was not effective in increasing EU imports from LDCs. It should be noted that those papers consider total trade and not imports at commodity level. On the contrary, by using trade at a very high level of data disaggregation, we have shown that the EBA initiative exerts a positive role in enhancing LDC exports to the EU for some products. In particular, the exports of crustaceans and vanilla were positively affected by the preferential treatment under EBA during the years of the application of the new initiative, while no conclusion can be draw when considering the exports of coffee, molluscs and cloves.

Many factors contribute to the result regarding the partial effectiveness of the EBA initiative. For instance, we get an indication of the weak trade relationship between EBA countries, as a group, and the EU by looking at the trade statistics used throughout this work. We find that there are very few LDCs actually exporting to the EU and this, from a technical point of view, is a source of the unsatisfactory estimations. This is because, whereas on one hand, EBA may have had a positive effect on an individual country, on the other hand, this effect might not be captured by a gravity equation, because the estimated parameters refer to the average impact

of the EU policy. This is, of course, common to all regressions whatever the subject, but in our case it is exacerbated by the massive presence of zeros in the array of margins of preference under EBA.

From a more general point of view, the fact that only a few LDCs exported to the EU could be due to the weak supply capacity of LDCs, but it is also related to the existence of non-tariff barriers, such as transaction costs associated with the RoO, administrative compliance and sanitary and phytosanitary standards which might lessen the effectiveness of preferential margins, especially for the smallest or poorest countries. In particular, as Bureau et al. (2007: 196) highlighted, the main motivation for the low utilisation of preferences is that DC are unable to "match the technical, sanitary, phytosanitary and traceability requirements imposed by developed countries, and, in particular, the private standards imposed by importers and retailers". Indeed, producers in developed countries can take advantage of technology whereas producers in developing or less developed countries are often unable to satisfy the standards required by the EU private retail sector.

Table 1 Export market shares of EBA countries in the EU-27 market (1998-2007).

Groups of Products (2-digit)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
HS01 Live Animals	0.008	0.006	0.004	0.123	0.010	0.019	0.035	0.283	0.001	0.021
HS02 Meat and Edible Meat Offal	0.000	0.000	0.002	0.025	0.049	0.000	0.000	0.001	0.001	0.000
HS03 Fish, crustaceans, molluscs, acquatic invertebrates	0.134	0.401	2.118	2.368	2.697	3.290	3.000	2.443	2.381	2.603
HS04 Dairy Products, Eggs, Honey Edible Animal	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.001
HS05 Products of Animal Origin	0.002	0.025	0.392	0.031	0.005	0.025	0.028	0.021	0.030	0.027
HS06 Live Trees, plants, bulbs, roots, cut flowers, etc.	0.002	0.010	0.006	0.009	0.006	0.030	0.033	0.233	0.441	0.849
HS07 Edible vegetables and certain roots and tubers	0.054	0.035	0.051	0.150	0.183	0.173	0.293	0.346	0.313	0.327
HS08 Edible fruit, nuts peel of citrus, melons	0.070	0.097	0.113	0.086	0.103	0.085	0.118	0.127	0.128	0.111
HS09 Coffee, tea, mate and spices	0.466	0.922	1.090	2.359	3.251	3.537	3.010	3.195	3.259	2.565
HS10 Cereals	0.011	0.006	0.005	0.014	0.012	0.013	0.026	0.036	0.032	0.025
HS11 Milling products, malt, starches, nulin wheat gluten	0.001	0.008	0.009	0.021	0.015	0.033	0.062	0.015	0.052	0.045
HS12 Oil seed, oleagic fruits, grain, seed, fruit, etc,	0.301	0.172	0.163	0.151	0.152	0.166	0.282	0.264	0.177	0.129
HS13 Lac, gums, resins, vegetable saps and extracts	0.347	0.467	0.410	0.962	0.775	0.667	0.467	0.430	0.530	0.583
HS14 Vegetables plaiting materials, vegetable products	0.726	0.512	0.345	1.913	2.554	3.309	3.236	2.799	2.331	2.093
HS15 Animal, Vegetables fats and oils, cleavage products, etc	0.502	0.260	0.951	0.965	0.565	0.337	0.228	0.167	0.064	0.193
HS16 Meat, fish and seafood food preparations	0.250	0.118	0.772	0.790	0.522	0.863	0.661	0.515	0.519	0.451
HS17 Sugars and sugar preparations	0.019	0.357	0.456	0.710	0.490	0.897	0.797	0.572	0.816	1.027
HS18 Cocoa and cocoa preparations	0.025	0.015	0.056	0.082	0.094	0.068	0.108	0.145	0.134	0.118
HS19 Cereal, flour, starch, milk preparations and products	0.001	0.001	0.001	0.003	0.009	0.005	0.009	0.019	0.029	0.041
HS20 Vegetable, fruit, nut etc food preparations	0.008	0.001	0.015	0.012	0.043	0.014	0.011	0.011	0.008	0.039
HS21 Miscellaneous edible prepariations	0.002	0.001	0.004	0.001	0.002	0.001	0.003	0.002	0.004	0.002
HS22 Beverages, spirits and vinegar	0.000	0.002	0.013	0.007	0.010	0.008	0.007	0.011	0.007	0.007
HS23 Residues, wastes of food industry, animal fodder	0.051	0.015	0.093	0.111	0.123	0.064	0.033	0.008	0.022	0.024
HS24 Tobacco and manufactured tobacco substitutes	0.014	1.132	1.032	0.914	0.906	0.922	0.777	0.913	1.646	1.817
HS29 Organic chemicals	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.002	0.000	0.000
HS35 Albuminoids, modified starches, glues, enzymes	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.002	0.001	0.001
HS41 Raw hides an skins and leather	0.038	0.055	0.061	0.755	1.233	0.874	1.089	1.138	1.286	1.331
HS50 Silk	0.001	1.564	3.425	0.005	0.013	0.005	0.005	0.002	0.010	0.010
HS53 Wool, animal hair, horsehair yarn and fabric thereof	0.098	0.224	0.098	0.228	4.067	2.572	2.834	3.216	3.270	4.149
Total Agricultural Exports (from HS01 to HS24)	0.089	0.160	0.353	0.421	0.421	0.469	0.418	0.408	0.442	0.444
Total Exports	0.038	0.050	0.083	0.105	0.196	0.196	0.225	0.199	0.170	0.184

Source: own computations on data from Comtrade (as it is on July 22, 2009).

Table 2 – Selecting criteria of the products at HS-4 digit level.

Commodity	EBA world exports %	GSP tariff	Stagionality?
Cloves (whole fruit, cloves and stems)	71.032%	positive	No
Vanilla beans	65.226%	positive	No
Ground-nut oil, fractions, not chemically modified	32.158%	equal to MFN (=0)	No
Copra	12.322%	equal to MFN (=0)	No
Live sheep and goats	8.772%	since 2002 GSP tariff was equal to 0	No
Coconuts, Brazil nuts and cashew nuts, fresh or dried	8.642%	equal to MFN (=0)	Yes
Lac, natural gums, resins, gum-resins and balsams	6.780%	equal to MFN (=0)	No
Peel of citrus fruit or melons	5.963%	positive	Yes
Oil seeds and oleaginous fruits nes	5.486%	equal to MFN (=0)	No
Crustaceans	5.024%	positive	No
Leguminous vegetables, fresh or chilled	4.709%	positive	Yes
Coffee, coffee husks and skins and coffee substitutes	4.335%	positive	No
Molluscs	4.049%	positive	No
Tea	3.947%	zero	No
Vegetable material for plaiting	3.530%	equal to MFN (=0)	No
Animals, live, except farm animals	3.285%	positive	No

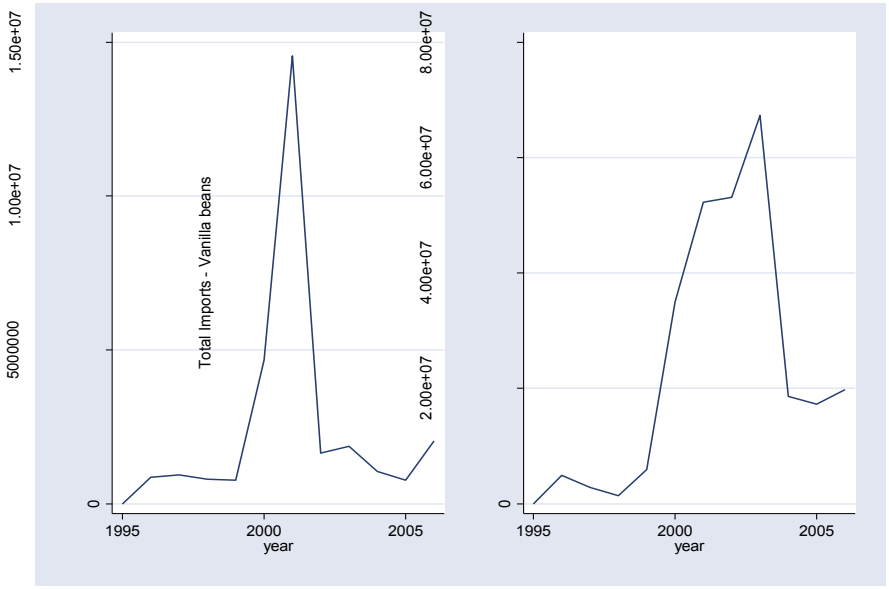
Source: own computations on data from Comtrade and Taric.

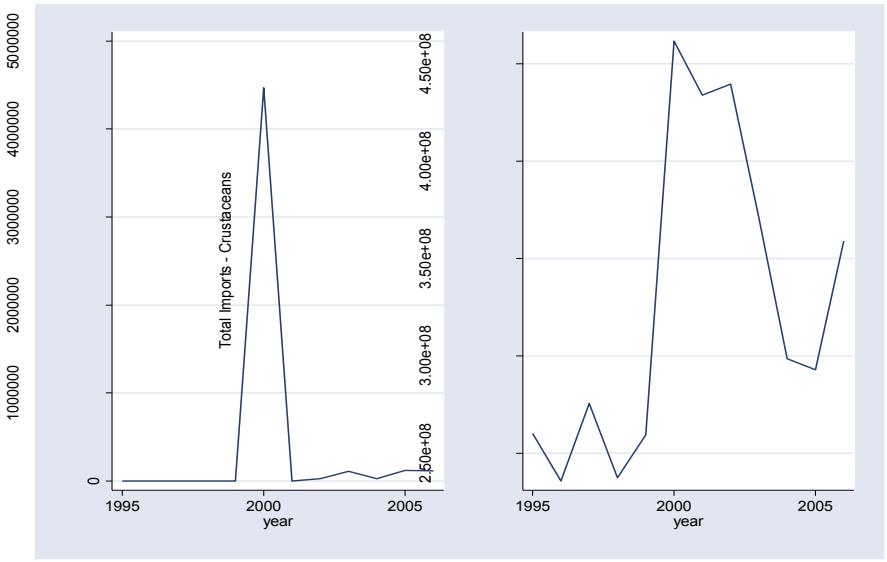
Table 3 - Estimates of the multiplicative specification of the gravity model. Dependent Variable: imports in levels, 1995-2006.

	Cloves 0907			Vanilla beans 0905			Coffee, coffee husks and skins and coffee substitutes 0901			Crustaceans 0306			Molluscs 0307		
GSP_{only}	-0.2796	*(.08)*	***	0.1160	*(.05)*	**	0.0468	*(.02)*	**	0.0450	*(.)*	***	-0.0262	*(.01)*	***
ACP_{only}	-8.2794	*(422.79)*		-0.0279	*(.06)*		0.0484	*(.03)*		0.0451	*(.)*	***	-0.0573	*(.02)*	***
RTA	0.2821	*(.06)*	***	0.0340	*(.03)*		0.0301	*(.01)*	***	0.0398	*(.)*	***	0.0269	*(.01)*	***
$_{13}EBA^{pre-2001}_{not-ACP}$										0.0616	*(.01)*	***	-8.5996	*(1204.04)*	
$_{13}EBA^{post-2001}_{not-ACP}$										0.0366	*(.01)*	***	-0.1363	*(.07)*	*
$_{36}EBA^{pre-2001}_{ACP}$	-0.0879	*(.07)*		0.2506	*(.05)*	***				0.0516	*(.)*	***	-0.0150	*(.02)*	
$_{36}EBA^{post-2001}_{ACP}$	-0.1963	*(.08)*	**	0.4101	*(.07)*	***	-0.0572	*(.06)*		0.0396	*(.)*	***	0.0000	*(.01)*	
log(POP_exporter)	-0.142	*(.06)*	**	0.180	*(.05)*	***	-0.120	*(.03)*	***	0.027	*(.01)*	***	0.037	*(.01)*	***
log(POP_importer)	0.507	*(.09)*	***	0.511	*(.08)*	***	0.205	*(.04)*	***	0.192	*(.01)*	***	0.156	*(.02)*	***
log(GDP/POP_exporter)	-0.808	*(.14)*	***	0.262	*(.08)*	***	0.454	*(.03)*	***	0.072	*(.01)*	***	-0.041	*(.01)*	***
log(GDP/POP_importer)	1.374	*(.31)*	***	1.453	*(.3)*	***	-0.151	*(.12)*		-0.100	*(.03)*	***	-0.004	*(.05)*	
MTR_importer	-1.218	*(.38)*	***	-2.686	*(.45)*	***	-0.254	*(.15)*		0.195	*(.04)*	***	0.141	*(.07)*	**
MTR_exporter	83.330	*(15.62)*	***	6.084	*(7.33)*		7.920	*(1.43)*	***	8.561	*(.38)*	***	8.854	*(.55)*	***
Trend	0.191	*(.02)*	***	0.180	*(.02)*	***	0.159	*(.01)*	***	0.008	*(.)*	***	0.161	*(.)*	***
Costant	-30.158	*(4.25)*	***	-33.673	*(3.87)*	***	-325.611	*(16.87)*	***	-8.268	*(.37)*	***	-9.082	*(.57)*	***
Observations	1056			1350			4877			60432			26322		
Wald Chi-square	297.5			266.44			757.54			1752.44			2718.18		
Log-Likelihood	-3549.0056			-4433.5239			-15643.176			-195601.09			-88998.935		
Davidson-MacKinnon test of exogeneity	0.5026			0.2125			1.4988	0.5026		0.1621			2.8904		
p-value	0.4791			0.6454			0.2214	0.4791		0.6872			0.0892		

Note: all regressions include yearly dummies; standard errors in parenthesis (robust to heteroskedasticity). (*), (**), (***) denote statistical significance at the 10%, 5% and 1% levels, respectively.

Figure 1 – EU imports from EBA countries of five selected HS4-digit agricultural products (1995-2006). Data are expressed at 2000 constant prices.





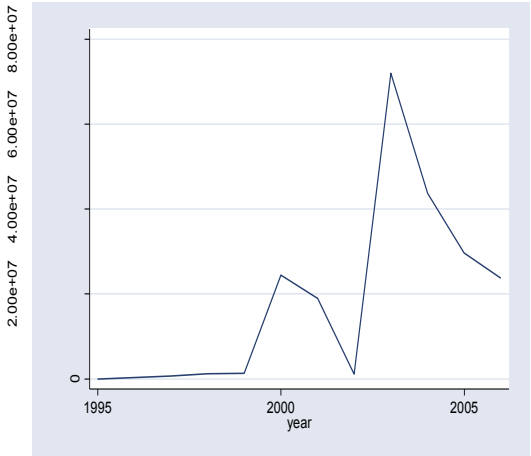
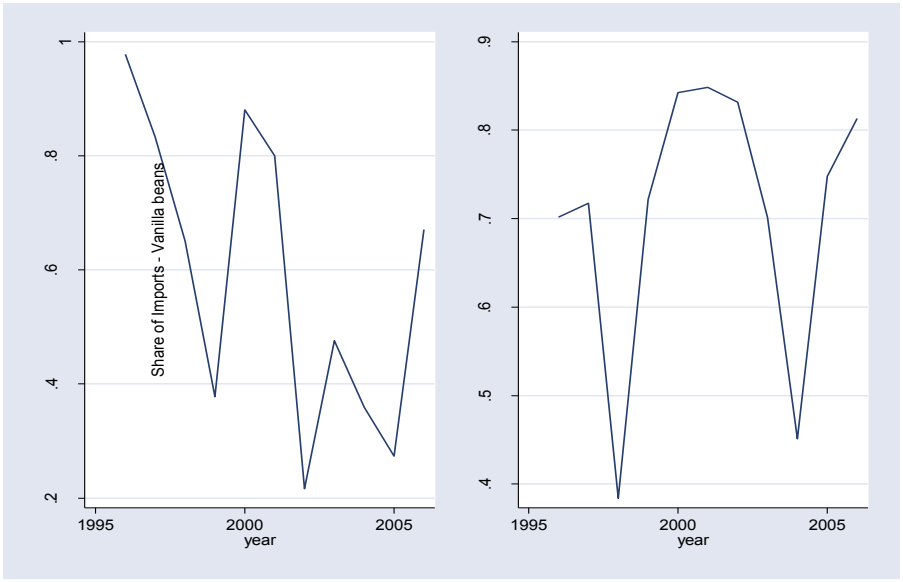


Figure 2 – Export market shares of EBA countries in the EU market of five selected HS4-digit agricultural products (1995-2006).



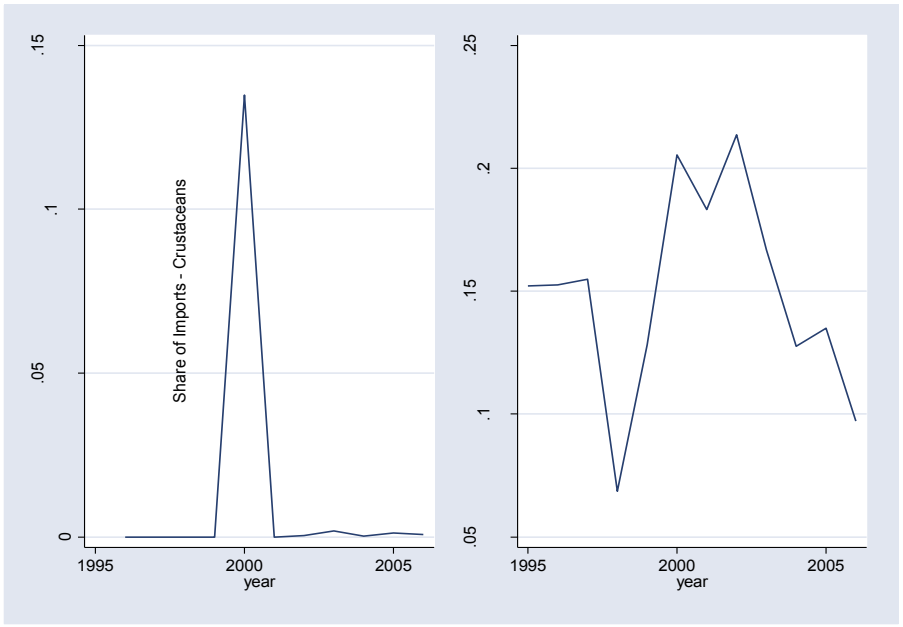


Figure 3 – Tariff trend for EU imports of Cloves by PTA, 1995-2006.

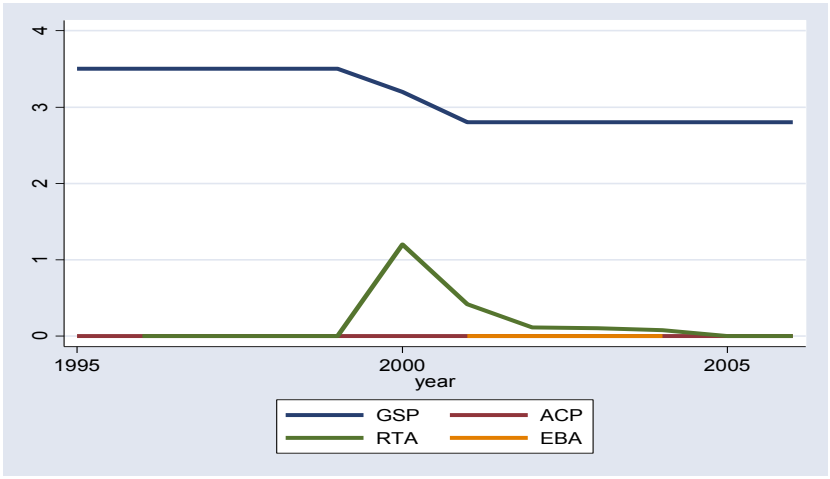


Figure 4 – Tariff trend for EU imports of Vanilla beans by PTA, 1995-2006.

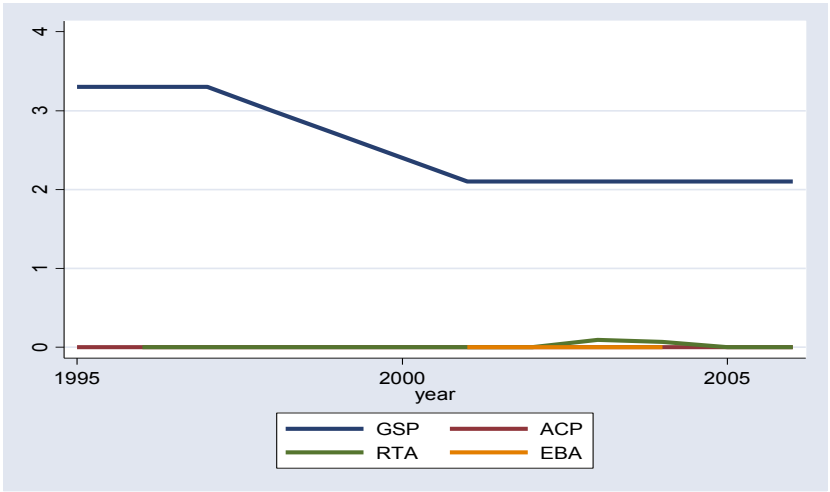


Figure 5 – Tariff trend for EU imports of Coffee by PTA, 1995-2006.

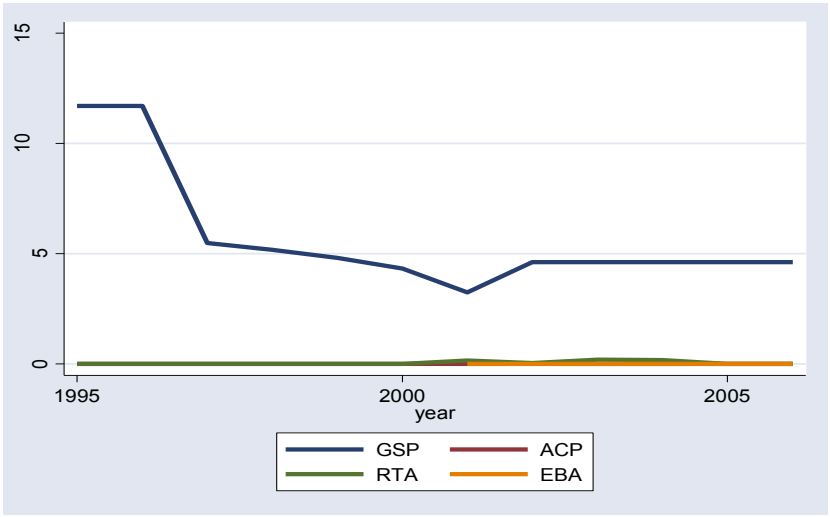


Figure 6 – Tariff trend for EU imports of Crustaceans by PTA, 1995-2006.

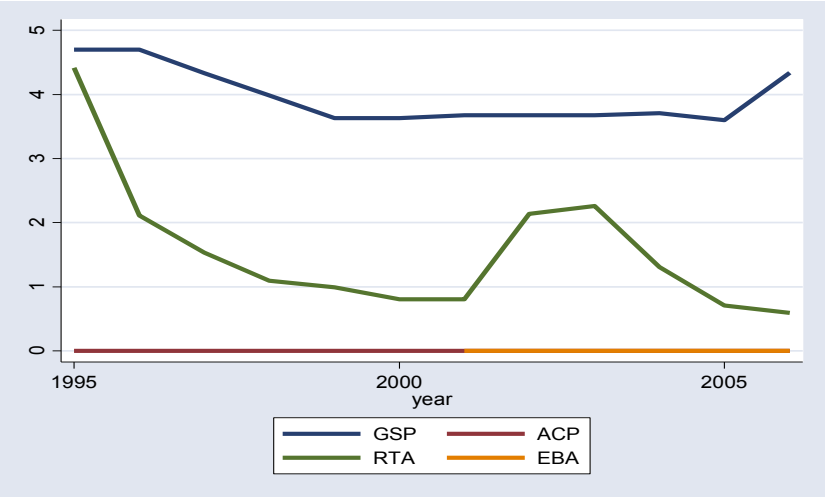
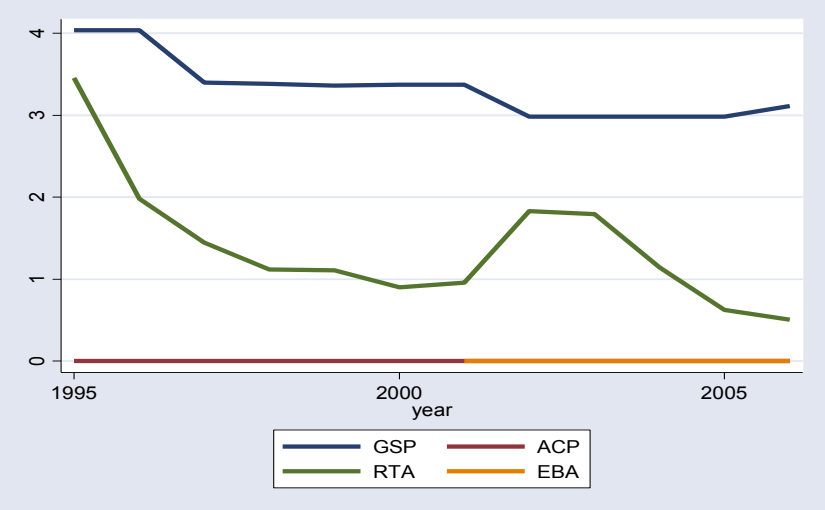


Figure 7 – Tariff trend for EU imports of Molluscs by PTA, 1995-2006.



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