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Trade impact of EU preferences

Maria Cipollina and Luca Salvatici

This paper assesses the impact on trade of European Union (EU) trade policies, using a gravity model based on disaggregated trade flows from 169 developing countries (DCs) to 25 EU member countries. It uses a sample selection framework to account for potential selection bias of positive trade flows and provides an explicit measure for relative preference margins. Results debunk some of the most widespread criticisms of preferential policies: EU preferences matter and have a positive impact on developing countries exports at the intensive margin, and an ambiguous impact at the extensive margin with significant differences across sectors.

1. Introduction

This paper analyses the impact of European Union (EU) preferences in terms of trade flows, including traditional non-reciprocal agreements as well as preferential access also granted to developing countries under bilateral reciprocal arrangements. Following Anderson and van Wincoop (2003, 2004), we derive a theoretically grounded gravity equation where the trade cost factor depends on bilateral distances, tariffs and preferential margins. From a policy perspective, we provide an assessment of the effectiveness of EU preferential trade policies in generating trade from developing countries (DCs).

Our analysis provides a micro-level assessment of the impact of trade preferences on the intensive and the extensive margins of trade. We estimate this impact by modelling bilateral EU imports at the Harmonized System 6-digit level (HS6), allowing for heterogeneous trade costs and substitution elasticities across industries. The use of disaggregated data raises two problems: (i) the impossibility, for some variables, to obtain information at the level of detail at which tariff lines are specified; (ii) the large percentage of ‘zero trade flows’, which introduces obvious problems in the log-linear form of the gravity equation. In terms of (i), in order to control for unobservable country and product heterogeneity, we introduce exporter, importer, and product-specific fixed effects. We address the issue of zero flows by adopting the Heckman (1979) sample selection model. This approach allows us to assess the impact of preferences on both numbers of bilateral trade flows (*extensive margin*) and quantities traded (*intensive margin*).

We estimate cross-sectional models for data on imports at 6-digit level to EU (25 countries) for year 2004, and run separate regressions for several commodity groups (Table 1) defined according to the WTO Multilateral Trade Negotiations categories, focusing on EU preferential schemes granted in the considered period. In brief, we consider the web of preferential trade

relations between EU and other countries or regional groupings, ranging from the traditional GSP to the Everything But Arms (EBA) initiative for the Least Developed Countries (LDCs), the Lomé/Cotonou agreements with the Africa- Caribbean-Pacific (ACP) countries, and the Bilateral Euro-Mediterranean Association Agreements. Although we do not know the utilization rates of different schemes, the use of the available information on actual preferential trade flows allows us to provide improved estimates of the impact of trade preferences on EU imports from DCs taking into account what is the share of preferential flows on total imports.

Preference margins are measured in relative terms and our definitions focus on actual preferences with respect to possible competitors, rather than measuring theoretical margins with respect to bound Most Favoured Nation (MFN) tariffs – i.e., the ceiling set by the World Trade Organization (WTO) commitments. Thus, we avoid possible overestimation of the competitive advantages enjoyed by exporting countries, although the impact of prohibitive tariffs is underestimated since we consider only actual not potential exporters (Cipollina and Salvatici, 2010). Our findings point to a significant, but heterogeneous impact of EU trade policy on DCs exports. The preferential regimes have positive impacts on both the extensive and intensive margins, although increased probability of trade is modest and increases in the intensity of trade vary widely across sectors. The impact on the probability of trade (i.e., the extensive margin) is positive in only one sector: this confirms that preferential policies lead exporting countries to specialize in a smaller set of products.

2. EU Preferential Trade Policies

In this paper, we focus on EU preferential schemes granted in the year 2004. In brief, we consider the web of preferential trade relations between EU and other countries or regional groupings, ranging from the traditional GSP to the Everything But Arms (EBA) initiative for the Least Developed Countries (LDCs), the Lomé/Cotonou agreements with the Africa- Caribbean-Pacific (ACP) countries, and the Bilateral Euro-Mediterranean Association Agreements.

The EU grants non-reciprocal tariff concessions to imports originating from most developing countries under the Generalized System of Preferences (GSP). The System was established in the 70s as a “waiver” to the provisions of the General Agreement on Tariffs and Trade, and there are currently 13 national GSP schemes notified to the WTO Secretariat. As far as the EU is concerned, DCs can access to the EU market with duties that are lower than the MFN ones under several schemes: the regular GSP; the GSP-Drugs concerning Latin America countries, the

GSP- Labor Rights and the GSP special “Everything but arms (EBA)” initiative for LDC and the Africa-Caribbean-Pacific (ACP) agreement.

Since 2001 the EBA initiative provides full access to the EU markets for the world’s 50 LDC (which includes 34 African economies). The EU has removed tariffs and quotas on most imports except arms and there are three exceptions (sugar, bananas and rice) which have a longer phase out period until 2009. For the period 2009-2011, 16 beneficiary countries, considered “vulnerable” in terms of its size or the limited diversification in its exports, have qualified to receive the additional preferences offered under the GSP-plus incentive arrangement for Sustainable Development and Good Governance.

In 2000, the EU signed the Cotonou Partnership Agreement with 77 ACP countries, which are mostly former colonies of the EU member States. The agreements constitute the follow-up of the of Yaoundé and Lomé Conventions which provided non-reciprocal trade benefits in 99 percent of industrial goods and some agricultural products. While the GSP is conceived as a unilateral, unbound grant by industrialized countries, the Lomé/Cotonou preferences are an integral part of a broader international treaty which is legally binding upon the two parties and by which the EU has committed itself on a contractual basis to ensure non-reciprocal preferential market access conditions for ACP products (Antimiani et al., 2006). In 2008, the unilateral preferences under the Cotonou Agreement were replaced by WTO-compatible, reciprocal full or interim EU Partnership Agreements (EPA), which are expected to progressively remove the barriers to trade and enhanced cooperation in all areas related to trade.

The EU has privileged relationships with its neighbouring countries, including 10 Mediterranean countries. The central element in European Neighbourhood Policy is the bilateral arrangements with each partner. The Euro-Mediterranean partnership was launched at the 1995 Barcelona Conference and foresaw a free trade area by 2010. The Bilateral Euro- Mediterranean Association Agreements are a first step in this direction. The EU has signed Association Agreements with Algeria, Egypt, Israel, Jordan, Lebanon, Morocco and Tunisia, while an interim Association Agreement governs relations between the EU and the Occupied Palestinian territory. These agreements allow for non-reciprocal, free access for nonsensitive products into the EU market, and progressive liberalization for other products.

Looking at data on imports in Table 2, half of imports enter in the EU market duty-free under MFN arrangements and of the imports that incur MFN duty, only around 15% enter using under a preferential schemes. The large share MFN duty-free imports is certainly not

surprising for raw materials as the Mineral products under Section V, and this does not leave much room for preferential trade. Also in the case of the second largest sector in terms of imports, Machinery (Section XVI), the share of preferential imports is only 10%, while in the case of the third largest sector, Textiles (Section XI), more than 40% of trade is preferential. In the remaining sectors, the shares of preferential imports range from around 10% for Instruments (Section XVIII) and Miscellaneous manufactures (Section XX), to around 70% in the case of the agrifood products under Sections I and IV.

In order to give an idea on the structure of tariffs in the case of preferential imports, Table 3 shows the share of preferential tariff lines as well as the bilateral applied tariff and the preference factor: in the latter two cases, we report the simple averages, implying the same weight for each tariff line regardless of the importance of the product to which the preference and the protection is granted, as well as the standard deviation in order to provide some information about the dispersion of the tariff structure. In this table, the preference factor is computed in relative terms, as the ratio of the maximum duty factor actually applied by the importer j (i.e., EU member) to all possible exporters of product k , and the duty incurred by a specific exporter i :

$$(1 + pref_{ijk}) = \frac{(1 + \tau_{jk}^{max})}{(1 + \tau_{ijk})} \quad (1).$$

Accordingly, the preference factor can increase, either because the exporter i benefits from a lower tariff, or because a higher duty is imposed on other exporters. It should be emphasized that in the case of overlapping preference schemes, the applied preferential rate considered is the lowest available to each exporter: this may lead to an overestimation of the preferential margins, since Bureau et al. (2007) show that some preferential regimes are systematically preferred to others.

Looking at the relative preferential factors (Table 3), the overall simple average is 1.05 with large differences across sectors. In addition to agricultural products (Sections I and IV), with relative preferential factors equal to 1.16 and 1.08, the next most preferred sectors appear to be textiles and footwear (Sections XI and XII). However, if we compare columns 1 and 2, it appears that, notwithstanding the preferences, these are the most protected EU sectors. On the other hand, these are also the sector with the largest share of actually used preferential tariff lines.

Table 3 also presents evidence on preference values, based on Candau and Jean (2005). Under simplifying assumptions, such as constant world prices, the value of the preference rent for any sector s can be computed as follows:

$$V_s = \sum_k (\tau_{jk}^{\max} - \tau_{ijk}) \text{prefImp}_{ik} \quad (2)$$

where prefImp_{ik} refers to EU preferential imports of product k from partner i .

The calculation of Equation (2) is likely to provide an upper bound estimate, since the assumption is that none of the rent is included in the export price. The value of EU preferences is almost equal to 4 million euros. This is a crude approximation. First, the (implicit) assumption that there are no supply constraints is rather simplistic, since a change in the EU trade policy regime is likely to exert upward pressure on world prices, which would tend to counterbalance, to some extent, the decrease in prices due to preference margins. Moreover, the extent of rent extraction by an exporter is likely to depend on the exporter's bargaining power vis-à-vis the importer. The rent for Textiles (Section XI) alone amounts to roughly half of the overall value, which is not surprising given the importance of this sector.

3. Econometric model

3.1. Specification

We start from a standard constant elasticity of substitution (CES), monopolistic competition model following Lai and Trefler (2002) and Lai and Zhu (2004). A trade separable model, in which allocation of the value of production and expenditure in country j for product class k , is separable from the bilateral allocation of trade across countries (Armington assumption), allows us to determine bilateral trade in a conditional general equilibrium, where the product markets for each good produced in each country, are conditional on the observed output structure and expenditure allocations.

Following Anderson and van Wincoop (2003, 2004) we derive our gravity equation including many commodity classes of goods (denoted by k where $k=1, 2 \dots K$) flowing between each country i and j :

$$m_{ijk} = \frac{Y_{ik} E_{jk}}{Y_{wk}} \left(\frac{T_{ijk}}{P_{ik} P_{jk}} \right)^{1-\sigma_k} \quad (3)$$

where m_{ijk} is the nominal demand for commodity k of country i by country j ; Y_{ik} is the production of commodity k for country i ; E_{jk} is the country j 's expenditure for product k ; Y_{wk} is world production of product k ; T_{ijk} is the trade cost; P_{ik} and P_{jk} are multilateral price indexes, and $\sigma_k > 1$ is the elasticity of substitution among all varieties, from different exporters.

The trade cost factor, T_{ijk} , reflects the impact of transport costs, proxied by distance (d_{ij}), common language (L_{ij}) and colonial links (C_{ij}), and trade policies, proxied by the *ad valorem* equivalent tariff factor imposed by country j on imports of commodity k from country i ($t_{ijk} = 1 + \tau_{ijk}$):

$$T_{ijk} = t_{ijk} d_{ij}^{\rho} e^{\delta_1 L_{ij} + \delta_2 C_{ij}} \quad (4)$$

where $L_{ij} = 1$ if i and j share a common language; and $C_{ij} = 1$ if i and j are linked by colonial ties.

Trade preferences reduce border costs as a consequence of tariff reduction. In the case of preferential imports, then, the trade cost is a function of the preference factor: higher preferences decrease trade cost and, thus, reduce the negative trade impact of the bilateral tariffs. Since we are interested in assessing the trade impact of preferences, this work is grounded in an explicit measure of the intensity of the preference margins at the 6-digit tariff line level, defined in equation (1).

Using (1) and (3) and rewriting equation (3) in logarithmic form, we get:

$$\begin{aligned} \ln m_{ijk} = & \alpha - \ln Y_{wk} + \ln Y_{ik} + \ln E_{jk} + \rho(1 - \sigma_k) \ln d_{ij} + \delta_1(1 - \sigma_k) L_{ij} + \delta_2(1 - \sigma_k) C_{ij} + (1 - \sigma_k) \ln(1 + \tau_{jk}^{mfn}) MFN + \\ & + [(1 - \sigma_k) \ln(1 + \tau_{jk}^{max}) + (\sigma_k - 1) \ln(1 + pref_{ijk})] PRE + (\sigma_k - 1) \ln P_{ik} + (\sigma_k - 1) \ln P_{jk} + \varepsilon \end{aligned} \quad (5).$$

The variable τ_{jk}^{mfn} is associated with the dummy MFN which is equal to 1 if imports enter without claiming any preferences; the variables τ_{jk}^{max} and the preference factor variable $(1 + pref_{ijk})$ are associated with the dummy PRE which is equal to 1 in the case of preferential trade flows. Since τ_{jk}^{mfn} , τ_{jk}^{max} , and Y_{wk} do not vary across exporters, in the estimation they are proxied by product fixed effects. Similarly, the estimated dummies for exporter and importer replace Y_{ik} and E_{jk} in equation (5). The use of product, importer and exporter fixed effects in the estimation is also widely used in the literature to account for multilateral price terms in cross section analysis.

3.2. Estimation

The large percentage of zero trade flows associated with the use of highly disaggregated data create obvious problems in the log-linear form of the gravity equation. We address the issue of zero flows by adopting the Heckman (1979) two-step procedure.

The Heckman two-step approach not only corrects for possible biases, it also allows us to distinguish the impact of preferences on the extensive as well as the intensive margins. An

increased probability of registering a positive trade flow, signals the existence of a larger set of bilateral trade flows (extensive margin), and can reflect either a larger variety of goods traded or a larger number of exporters of the same good. On the other hand, the coefficient associated with the preference margin, in the second stage refers to trade in larger quantities than would have been the case without the preference (intensive margin).

In practice, in the first stage we estimate the following probit model:

$$\rho_{ijk} = \Pr (m_{ijk}^* > 0 | d_{ij}, pref_{ijk}, L_{ij}, C_{ij}, \text{product and country-specific fixed effects}) \quad (6).$$

The existence of positive trade flows should be affected by fixed rather than variable trade costs: Helpman *et al.* (2007), for instance, include the variable *common religion* in the first-stage regression, although they acknowledge that a common language indicator would be just as useful. Indeed, cultural factors, and especially a common language, are well-known determinants of trade. We posit that the additional complexity inherent in an intermediated relationship, the potential for costly errors, and the increased cost may be large enough to prevent some transactions. Accordingly, the dummy L_{ij} for common language, provides the required identifying restriction: in the second stage we estimate a modified version of equation (5) dropping the language dummy and adding the inverse Mills ratio estimated in the first stage.

Finally, we compute the percentage change due to the hypothetical elimination of existing preferences as follows (Lai and Zhu, 2004):

$$Preference\ effect = \frac{\sum_{ijk} (E[m_{ijk} | pref_{ijk} > 0] - E[m_{ijk} | pref_{ijk} = 0])}{\sum_{ijk} E[m_{ijk} | pref_{ijk} > 0]} \quad (7).$$

In calculating these results, we estimate the counterfactual change in the dependent variable, total EU imports, which would follow from the removal of the preferential advantage. This could be considered the ‘trade creation’ effect, since the trade flow would not take place in the absence of preferences. However, such an effect cannot be interpreted in welfare terms, since the additional trade flows may be the result of the diversion of previously existing exports from other countries (Borchert, 2009). Moreover, this calculation may overestimate the total sum of foregone exports, since indirect effects are not captured via changes in world prices.

4. Data

Data on trade at the HS6 level of detail are taken from the Eurostat Comext database (<http://fd.comext.eurostat.cec.eu.int/xtweb/>); data on tariffs are from the MAcMapHS6-V2 database (<http://www.cepii.fr/>). MAcMap provides a consistent worldwide assessment of

protection, including *ad valorem* equivalent rates of specific duties and tariff rate quotas (including those introduced at the end of the Uruguay Round), for 2004, at the HS6 level (Boumelassa *et al.*, 2009). Data for the remaining explanatory variables are from the Cepii dataset, which includes distances between countries and two sets of dummies for – a common language, and former colonial links.

We estimate cross-sectional models, covering imports of 4,941 commodities from 169 DCs to 25 EU member countries. The observations actually used (825,204) is much lower than the number potential bilateral trade flows (25 importers*169 exporters*4,941 products) for two reasons.

First of all, we exclude binding TRQs from our dataset since they may raise a limited dependent variable estimation problem. As a consequence, a few sectors (II, III, X, and XXI) do not feature any preferences, and are excluded from the sample as well as a sector such as Arms and ammunition (Section XIX) where trade is likely to be heavily influenced by politics rather than by relative prices.

More importantly, countries do not produce all possible goods, nor do they all have an effective demand for all available goods. Accordingly, we distinguish between two different kinds of zero-valued trade flows: products that are never traded and products that are not traded, but could be (potentially, at least) traded. Hence, a distinction can be made between flows with exactly zero probability of positive trade, flows with a non-zero trade probability who still happen to be zero, and positive flows. Since preferential policies cannot possibly influence the first group, in our sample we only keep exporters that have at least one export flow at the world level at the HS6 level for the product concerned, assuming that excluded commodities that are not produced. In the same vein, we exclude products that are not imported at all in the EU. This avoids the inclusion of irrelevant information that may bias the estimate, and greatly reduces the dimension of the dataset.

The Comext database does not provide information on the utilization of each preference scheme. However, it distinguishes preferential and non-preferential (MFN) trade. Using the information on preferential trade flows, the level of duty (τ_{ijk}) used for the computation of the preference margins is equal to the MFN (applied) tariff if the preference is not used, and to the preferential (bilateral) tariff otherwise. Accordingly, our estimation will take account of the volume of trade benefiting from the preferences, and avoid overestimation of the preference

impact that can arise from the association between a positive preference and a trade flow that does not exploit it.

5. Results

Table 4-5 report estimates regarding the preferences: the first stage allows to estimate the impact of preferential policies on the extensive margin, i.e., the share of positive trade flows over the total number of possible bilateral trade flows (Table 4). While the second stage quantifies the extent to which trade preferences have increased the volume of trade (Table 5). In each table we highlight the rows referring to significant estimates based on preferences.

Table 4 presents the results of the preference impact on extensive margin of trade for commodity groups. In the first stage, all control variable estimates show the expected signs, with the only exception of the dummy for common language which is negative in the case of chemical products (Section VI). Overall results show that the preference margin have a slightly positive, though statistically significant, impact on the probability of registering a positive trade flow. The estimated coefficient of 0.02 reflects the mean impact of preferential policies on the extensive margin among sectors.

Looking at results by commodity groups, the estimates for the preference margin are statistically significant for ten out of sixteen cases. In almost one third of the cases – namely, sections I, VI, VII, IX, XVII and XX – the preference impact on the extensive margin is not significant. These sectors are characterized by a lower number of preferential tariff lines with positive trade (Sections VI and IX), a higher degree of preference concentration (Sections VII, XVII and XX) or higher levels of applied tariffs (Section I). The preferential access leads to an expansion in the number of traded products only in the case of Foodstuffs, beverages, spirits and tobacco (Section IV): the estimated coefficient of 0.84 implies that a 10% increase in the relative preference factor – roughly corresponding to an average reduction of 10 percentage points in the bilateral applied tariffs at the estimation point – increases the probability of registering a positive trade flow (i.e., the extensive margin) by more than 8%. Indeed, looking at the preference factors' standard deviations (Table 3), this is by far the Section where preferences appear to be less concentrated.

In almost half of the cases the estimated coefficients are negative, implying that due to preferential policies developing countries specialize in a smaller number of exported products than it would be the case otherwise. The negative impact ranges between 0.04 in the case of articles of stone (Section XIII) and 0.30 in the case of Instruments (Section XVIII). Although we

cannot draw any conclusions about eventual welfare impacts, our results show that in several cases the number of exported products is likely to be reduced as a consequence of EU preferential policies.

In the second stage (Table 5), the positive and significant coefficient of the Mills ratio confirms that correcting for sample selection bias is justified. The coefficients of bilateral distance and colonial links show the expected signs, with exception of the dummy for colonial links which is negative in the case of Mineral products (Section V). There are large differences for the negative impact of distance, our proxy for transport costs: these results support our decision to run separate rather than a pooled regression, since the latter would have implied unwarranted restrictions on the trade cost coefficients.

Concerning our variable of interest, Table 5 shows the preference impact on intensive margins of trade. The estimated coefficients are related to the elasticity of substitution across sections and countries by the following relation: $\hat{\sigma}_s = \hat{\beta}_s + 1$. The estimate for the average elasticity of substitution across sections is statistically significant and equal to 1.14, but it is worth noting that such an estimate is likely to underestimate the preference impact. Indeed, exporters usually incur some additional costs (e.g., due to rules of origin compliance) in order to benefit from preferences. This implies that the ‘true’ (i.e., net of compliance costs) preference margin generating the observed trade flows is lower than the one associated with our estimates.

Looking at sectoral results, the estimates for the elasticities of substitution are always significant. The choice to run separate regressions, quite common in the literature (Baldwin et al., 2005; Lai and Trefler, 2002), seems appropriate, since we find evidence of significant differences in substitution elasticities across industries. The estimated coefficients, ranging between 0.02 for Instruments (Section XVIII) to 0.23 for Mineral products (Section V), are by and large consistent with those obtained in the literature (Baier and Bergstrand, 2001; Eaton and Kortum, 2002; Lai and Trefler, 2004; Olper and Raimondi, 2008). Lower sensitivity to preferences is shown by sections featuring smaller margins (on average) – as in the case of Sections IX, XVI and XVIII –, but the effectiveness of the preferences appears to be inversely related with the height of the preferential duties: accordingly, large impacts are recorded in sections with low duties (e.g., V, VII, XIII and XVII) while large margins are less effective when preferential duties remain high, as in the case of Sections I and XI.

Table 6 presents results regarding the percentage change in total imports due to the hypothetical elimination of existing preferences according to equation (7). The average

preference impact is over 3%, which means that the absence of preference would reduce bilateral trade volumes between DCs and the 25 EU member countries by €13,986 million, representing almost 21% of preferential trade flows. The impact of EU preferences are negligible in the case of Mineral products (Section V), Wood and wood articles (Section IX), as it may be expected since the set of goods to be exported is heavily influenced by the endowments of natural resources, and Instruments (Section XVIII) characterized by the lowest elasticity value. In relative terms, the largest impact is registered by Foodstuffs, beverages, spirits and tobacco (Section IV), which is the sector with the largest share of preferential imports; but more than one third of the preference-generated additional trade refers to Textiles (Section XI) and Machinery (Section XVI).

The third column of Table 6 shows that most of the preference value is represented by the rent earned on exports that would take place anyway. Roughly 20% of preferential trade would be affected by preference elimination. The most relevant sector to be concerned by possible preference erosion is Machinery (Section XVI), while agrifood products (Section I and IV) are among those less affected.

5. Conclusions

This paper shows that preferential schemes have a significant impact on intensive margin of trade, and a debatable impact on extensive margin of trade with significant differences across sectors. We obtain robust estimates for the impact of EU preferences on bilateral trade flows. We control for possible biases in three dimensions: measurement of the intensity of the (relative) preference margins, impact on the extensive as well as on the intensive margins of trade, and distinction between preferential and MFN trade flows.

Methodologically, our study confirms that there is little support for the use of aggregated data and that when using disaggregated data, the estimations should be conducted on a sector-by-sector basis. Working at the most detailed level allowed by the data increases the problem of zero trade flows. In line with the most recent evidence, we deal with this problem by applying a Heckman correction approach and controlling for selection bias due to the presence of zeros.

We quantify the intensity of the preference margins, rather than relying on a simple dummy. In order to emphasize the advantage granted with respect to other

importers, preferential margins are computed for each product, as the difference between the highest tariff applied by the EU and the actual duty paid by each exporter.

From a policy perspective, preferences influence the extensive margins of trade and overall there is a slight increase in the probability of registering a positive trade flow. However, this is due to a single sector, Agrifood (Section IV), since in all the other cases the only significant impacts are negative: this implies that countries benefiting from preferential schemes export a smaller set of goods. In terms of the impact on trade volumes, we find that EU agricultural imports increased as a consequence of preference margins, by almost €13 billion, that is more than 20% of preferential trade flows.

Although decisions about whether and how much to trade does not only depend on a simple substitution elasticity, the following policy implications can be drawn from our results. The agrifood sector, namely Sections I and IV, presents the largest share of preferential trade, and preferences have been effective in increasing trade at both margins, even if the impact on rents is larger than the impact on trade volumes.

Similarly, the textile, leather and apparel sector (Sections VIII, XI and XII) presents the largest values in terms of preferential trade, due to a positive impact of preferences on the intensive margins, while exporters tend to specialize in a smaller set of products. Also in the case of Section XIII, the estimated preference impact is relevant (around 8% of total trade, see Table 6) due to the positive impact on the intensive margin (0.20: Table 5). Since most of imports still face positive MFN duties (Table 2), DCs may look for an enlargement of preferences in these sectors.

In sectors that include raw materials, as Mineral products (Section V), wood and articles of wood (Section IX), natural pearls and precious stones (Section XIV) and metals (Section XV), the impact of EU preferences is negligible. In some cases (e.g., Sections V and XIV), this is obviously explained by the fact that most of imports enjoy MFN duty free access

A major sector in terms of trade is machinery (Section XVI) which accounts for 22% of total trade (Table 2). Almost half of imports face positive duties, but the share of preferential trade is only 10%. A similar structure of trade is presented in the case of the transport sectors (Section XVII), in which all imports face positive MFN duties, and the share of preferential trade reaches 36% (Table 3). In these sectors the estimated coefficient for the preference margins are positive and statistically significant: 0.12 and 0.21, respectively (Table 5) Preferences seem also affect the intensive margin of trade of plastic

products and chemicals (Sections VI and VII), while they do not have an impact on the extensive margin. If we look at the structure of tariffs in Table 3, in these sectors there seems to be some room to increase or extend the EU preferences.

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TABLES

Table 1: Commodity Classification

Sectors according to the Harmonized Commodity Description And Coding System
Section I: Live Animals; Animal Products (Chapters 1-5)
Section II: Vegetable Products (Chapters 6-14)
Section III: Animal or Vegetable Fats and Oils and Their Cleavage Products; Prepared Edible Fats; Animal or Vegetable Waxes (Chapter 15)
Section IV: Prepared Foodstuffs; Beverages, Spirits, and Vinegar; Tobacco and Manufactured Tobacco Substitutes (Chapters 16-24)
Section V: Mineral Products (Chapters 25-27)
Section VI: Products of the Chemical or Allied Industries (Chapters 28-38)
Section VII: Plastics and Articles Thereof; Rubber and Articles Thereof (Chapters 39-40)
Section VIII: Raw Hides and Skins, Leather, Furskins and Articles Thereof; Saddlery and Harness; Travel Goods, Handbags, and Similar Containers; Articles of Animal Gut (Other Than Silkworm Gut) (Chapters 41-43)
Section XIX: Wood and Articles of Wood; Wood Charcoal; Cork and Articles of Cork; Manufactures of Straw, of Esparto or of Other Plaiting Materials; Basketware and Wickerwork (Chapters 44-46)
Section XX: Pulp of Wood or of other Fibrous Cellulosic Material; Waste and Scrap of Paper or Paperboard; Paper and Paperboard and Articles Thereof (Chapters 47-49)
Section XI: Textiles and Textile Articles (Chapters 50-63)
Section XII: Footwear, Headgear, Umbrellas, Sun Umbrellas, Walking-Sticks, Seat-Sticks, Whips, Riding-Crops and Parts Thereof; Prepared Feathers and Articles Made Therewith; Artificial Flowers; Articles of Human Hair (Chapters 64-67)
Section XIII: Articles of Stone, Plaster, Cement, Asbestos, Mica or Similar Materials; Ceramic Products; Glass and Glassware (Chapters 68-70)
Section XIV: Natural or Cultured Pearls, Precious or Semiprecious Stones, Precious Metals, Metals Clad with Precious Metal, and Articles Thereof; Imitation Jewellery; Coin (Chapter 71)
Section XV: Base Metals and Articles of Base Metal (Chapters 72-83)
Section XVI: Machinery and Mechanical Appliances; Electrical Equipment; Parts Thereof; Sound Recorders and Reproducers, Television Image and Sound Recorders and Reproducers, and Parts and Accessories of Such Articles (Chapters 84-85)
Section XVII: Vehicles, Aircraft, Vessels and Associated Transport Equipment (Chapters 86-89)
Section XVIII: Optical, Photographic, Cinematographic, Measuring, Checking, Precision, Medical or Surgical Instruments and Apparatus; Clocks and Watches; Musical Instruments; Parts and Accessories Thereof (Chapters 90-92)
Section XIX: Arms and Ammunition; Parts and Accessories Thereof (Chapter 93)
Section XX: Miscellaneous Manufactured Articles (Chapters 94-96)
Section XXI: Works of Art, Collectors' Pieces and Antiques (Chapter 97)

Table 2. Share of imports by type of tariff regime (period 2004)

Sections	% of MFN duty-free	% of MFN duty (no preference)	% of Preferential duty	Total trade (Ml of €)	Preferential trade (Ml of €)
<i>Overall</i>	50.6	33.8	15.4	405,297	62,598
I	0.4	32.6	67.0	5,560	3,725
II	88.5	11.5	0.0	9	0
III	0.0	100.0	0.0	0.324	0
IV	0.1	26.7	73.1	1,271	929
V	97.4	1.2	1.0	116,000	1,180
VI	33.4	45.3	21.5	14,900	3,197
VII	16.2	59.7	24.1	10,304	2,482
VIII	0.2	90.0	9.8	5,593	548
IX	44.0	43.7	12.3	7,772	953
X	100.0	0.0	0.0	3,442	0
XI	0.3	56.7	42.9	51,500	22,100
XII	0.2	64.6	35.2	9,724	3,426
XIII	7.2	56.6	36.2	4,079	1,475
XIV	71.2	16.1	12.7	8,769	1,118
XV	56.4	32.3	11.4	33,700	3,854
XVI	49.2	40.6	10.2	89,100	9,081
XVII	0.4	63.8	35.8	17,400	6,230
XVIII	22.2	68.4	9.5	7,610	722
XIX	0.0	75.3	24.7	48	12
XX	38.4	52.8	8.5	18,400	1,565
XXI	100.0	0.0	0.0	119	0

Table 3. Value and preference margins for commodity groups with preferential trade flows

Sections	Bilateral applied tariff (%): τ_{ijk}	Share of preferential tariff lines		Relative Preference factor ($1 + pref_{ijk}$)	Value of preference (MI €)
	<i>Mean (Std. dev.)</i>	<i>Potential</i>	<i>Used*</i>	<i>Mean (Std. dev.)</i>	
<i>Overall</i>	1.6 (3.17)	29	54	1.05 (0.04)	3,926
I	2.0 (3.17)	48	51	1.08 (0.04)	314
IV	3.5 (5.58)	54	44	1.16 (0.09)	206
V	0.0 (0.00)	4	15	1.01 (0.01)	16
VI	0.5 (0.93)	25	51	1.05 (0.01)	151
VII	0.3 (0.88)	27	66	1.05 (0.02)	110
VIII	0.4 (1.08)	39	60	1.04 (0.02)	21
IX	0.6 (1.23)	18	54	1.03 (0.01)	33
XI	3.3 (4.12)	55	44	1.07 (0.05)	1872
XII	2.3 (4.22)	49	49	1.06 (0.05)	166
XIII	1.3 (2.53)	35	57	1.04 (0.03)	66
XIV	0.0 (0.00)	4	66	1.03 (0.01)	32
XV	0.3 (0.88)	21	56	1.03 (0.01)	137
XVI	0.1 (0.76)	15	65	1.02 (0.02)	323
XVII	0.9 (2.36)	21	76	1.04 (0.03)	413
XVIII	0.3 (0.63)	20	59	1.02 (0.01)	16
XX	0.1 (0.32)	56	43	1.03 (0.01)	50

* percentage of preferential tariff lines that enter the EU under a preferential scheme

Table 4. Results for commodity groups – extensive margin

Probit regression, marginal effects	$\ln d_{ij}$	$\ln(1 + pref_{ijk})$	C_{ijk}	L_{ijk}	N. of obs. <i>Pseudo R</i> ²
<i>Overall</i>	-0.48 ^{***} (0.01)	0.02 ^{***}	0.09 ^{***} (0.01)	0.01 (0.01)	824,000 0.10
I	-0.75 ^{***} (0.06)	0.03 (0.04)	0.14 ^{**} (0.07)	0.15 ^{**} (0.07)	11,824 0.20
IV	-0.64 ^{***} (0.15)	0.84 ^{***}	0.03 (0.18)	0.47 ^{**} (0.20)	3,238 0.20
V	-0.47 ^{***} (0.05)	-0.29 [*] (0.15)	-0.09 (0.07)	-0.01 (0.07)	11,937 0.10
VI	-0.59 ^{***} (0.02)	-0.01 (0.02)	0.15 ^{***} (0.03)	-0.08 ^{***} (0.04)	59,237 0.13
VII	-0.76 ^{***} (0.03)	-0.02 (0.02)	0.19 ^{***} (0.04)	-0.01 (0.04)	40,652 0.19
VIII	-0.74 ^{***} (0.05)	-0.21 ^{***}	0.26 ^{***} (0.07)	0.14 [*] (0.08)	15,616 0.23
IX	-0.68 ^{***} (0.04)	0.02 (0.03)	0.15 ^{**} (0.05)	0.04 (0.05)	20,336 0.16
XI	-0.68 ^{***} (0.01)	-0.05 ^{***} (0.01)	0.12 ^{***} (0.02)	0.13 ^{***} (0.02)	194,219 0.22
XII	-0.88 ^{***} (0.05)	-0.09 ^{***} (0.02)	0.21 ^{***} (0.06)	0.07 (0.06)	17,770 0.24
XIII	-0.72 ^{***} (0.03)	-0.04 [*] (0.02)	0.22 ^{***} (0.04)	-0.07 (0.05)	29,316 0.19
XIV	-0.38 ^{***} (0.08)	-0.27 ^{**} (0.11)	0.17 ^{**} (0.08)	0.17 ^{**} (0.09)	8,711 0.22
XV	-0.60 ^{***} (0.02)	-0.09 ^{***} (0.02)	0.17 ^{***} (0.02)	-0.01 (0.03)	83,721 0.17
XVI	-0.61 ^{***} (0.01)	-0.11 ^{***} (0.02)	0.18 ^{***} (0.02)	0.08 ^{***} (0.02)	166,275 0.18
XVII	-0.52 ^{***} (0.03)	-0.01 (0.02)	0.17 ^{***} (0.04)	0.10 ^{**} (0.05)	25,540 0.19
XVIII	-0.47 ^{***} (0.03)	-0.30 ^{***} (0.04)	0.19 ^{***} (0.03)	0.01 (0.04)	47,855 0.17
XX	-0.65 ^{***} (0.03)	-0.03 (0.05)	0.24 ^{***} (0.03)	0.04 (0.04)	40,654 0.20

Note: Dependent variable: Pr ($trade_{ijk} > 0$); Product, Importer and Exporter Fixed Effects (not reported); Intercept (not reported); Standard errors in parentheses; (*) significant at 10% level; (**) significant at 5% level; (***) significant at 1% level.

Table 5. Results for commodity groups – intensive margin.

Independent variables	$\ln d_{ij}$	$\ln(1 + \text{pref}_{ijk})$ *PRE	C_{ijk}	<i>Mills ratio</i>	N. of non-zero obs.	Elasticity of substitution, \square_{EU}
Section						
Overall	-3.13*** (0.10)	0.14*** (0.00)	0.51*** (0.05)	9.66*** (0.31)	404,449	1.14
I	-1.36*** (0.29)	0.14*** (0.01)	0.34** (0.13)	2.41*** (0.55)	5,233	1.14
IV	-0.20 (0.40)	0.16*** (0.03)	0.24 (0.28)	-0.72 (0.79)	728	1.16
V	-0.47 (0.39)	0.23*** (0.04)	-0.46*** (0.15)	0.70 (1.31)	4,823	1.23
VI	-3.58*** (0.43)	0.15*** (0.02)	0.53*** (0.19)	8.69*** (1.07)	25,746	1.15
VII	-3.53*** (0.29)	0.19*** (0.01)	0.78*** (0.18)	7.09*** (0.60)	19,560	1.19
VIII	-2.36*** (0.27)	0.16*** (0.02)	1.05*** (0.21)	4.69*** (0.51)	7,068	1.16
IX	-2.71*** (0.30)	0.06*** (0.02)	0.80*** (0.18)	5.41*** (0.71)	10,941	1.06
XI	-2.29*** (0.08)	0.12*** (0.00)	0.59*** (0.06)	5.00*** (0.14)	100,868	1.12
XII	-2.47*** (0.19)	0.19*** (0.01)	0.74*** (0.14)	3.92*** (0.31)	10,173	1.19
XIII	-2.82*** (0.25)	0.20*** (0.01)	0.61*** (0.17)	6.10*** (0.53)	15,664	1.20
XIV	-1.45*** (0.43)	0.13*** (0.03)	1.03*** (0.34)	6.21*** (0.91)	4,901	1.13
XV	-3.09*** (0.23)	0.16*** (0.01)	0.78*** (0.14)	7.95*** (0.56)	39,216	1.16
XVI	-2.61*** (0.10)	0.12*** (0.01)	0.99*** (0.07)	5.90*** (0.21)	87,979	1.12
XVII	-1.99*** (0.21)	0.21*** (0.01)	0.77*** (0.16)	4.63*** (0.60)	12,131	1.21
XVIII	-1.47*** (0.11)	0.02** (0.01)	0.47*** (0.08)	3.61*** (0.24)	23,552	1.02
XX	-2.33*** (0.17)	0.14*** (0.01)	0.80*** (0.14)	5.63*** (0.37)	23,690	1.14

Note: Dependent variable: $\ln(\text{trade}_{ijk})$; Product, Importer and Exporter Fixed Effects (not reported); Intercept (not reported); Standard errors in parentheses; (*) significant at 10% level; (**) significant at 5% level; (***) significant at 1% level.

Table 6. The estimated preference effect – Results for commodity groups

Sectors	Preference effect (%)	Trade volume (Ml of €)	% of Preferential trade
<i>Overall</i>	3.31	12,986	21%
I	7.50	388	10%
IV	9.06	106	11%
V	0.78	898	76%
VI	2.59	376	12%
VII	6.73	649	26%
VIII	8.04	416	76%
IX	0.01	1	0.1%
XI	5.50	2,685	12%
XII	7.04	640	19%
XIII	7.88	298	20%
XIV	3.04	259	23%
XV	2.03	670	17%
XVI	2.28	1,986	22%
XVII	4.61	767	12%
XVIII	0.08	6	1%
XX	1.51	274	17%