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Trade preference index*

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Abstract

Building on the work by Anderson and Neary on theoretically grounded trade policy indexes, we define an aggregate measure (Mercantilistic trade preference index – MTPI) of the trade preferential margins. The MTPI provides a method of aggregation that is consistent with a common objective of the preferential policies, since it focuses on the volume of exports. We compute the bilateral MTPIs for the preferences granted by the European Union to 162 exporters to assess how the market access granted by the EU preferential trade agreements does differ across sectors and countries.

JEL Classification: F13; Q17
Keywords: International agricultural trade; Protection; Tariffs

1. Introduction

The acknowledgement that increased trade is essential for the world's poor countries to reap the potential benefits of globalization is a commonly shared view. Yet there is a lively political and theoretical debate on how best to accomplish this end. The prevailing approach, known as "special and differential treatment", grants developing countries preferential access to industrialized countries' markets without reciprocal liberalization in turn.

In 1968, arguments in favor of special and differential treatment for developing countries lead to the establishment of the first instrument for such non-reciprocal trade preferences, namely the Generalized System of Preferences (GSP). Even now, 40 years after General Agreement on Tariffs and Trade (GATT) members first authorized GSP as a "temporary" measure, it remains highly popular among developing country beneficiaries and its principles are enshrined in the postures industrialized countries and international institutions adopt in dealing with developing countries.

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For almost half a century, non-reciprocal preference schemes have sought to promote industrialization, increase exports and foster growth in developing countries. Ostensibly, a country enjoying trade preferences should register an export growth relative to other exporting countries still facing Most Favoured Nation (MFN) tariffs, either bound or applied.[1] But how important are these trade preferences to developing countries? Are the tariff margins large? Indeed, there is a vast and growing literature studying how valuable are the preferences available to developing countries (Alexandraki and Lankes, 2004; Bouët *et al.*, 2005; Candau and Jean, 2005), and assessing their economic impacts by means of gravity models[2].

This paper focuses on the European Union (EU) tariff preferences. The EU, as a matter of fact, is not only one of the major trading partners for the developing countries, but it has also been engaged in a web of preferential trade relations with other countries or regional groupings which range from the regular GSP to specific provisions for the Least Developed Countries (LDCs), the Everything But Arms – EBA – initiative, the Africa-Caribbean-Pacific (ACP) agreement[3] and the Bilateral Euro-Mediterranean Association Agreements.[4] The objective of this paper is to shed some light on this debate improving our measures of the market access granted by the EU preference programs.

Countries have tariff schedules with thousands of tariff lines, featuring very high variation in tariff rates, and any preferential trade policy agreement does vary a lot across products and exporters. As a consequence, the analysis should be carried out using the most disaggregated available data. On the other hand, if we want to carry out sensible comparisons across products, countries and over time we need to construct measures that summarize the levels of trade preferences implied by the various schemes available for different commodities and/or countries.

The main contribution of the paper is the computation of aggregate indexes of the preferences granted by EU to different sectors and country groups. In this respect, we will draw on the literature measuring trade restrictiveness according to the theory of index numbers (Anderson, 1995), and we build on the work of Anderson and Neary (2003) defining a Mercantilistic Trade Preference Index (MTPI) that is computed using a partial equilibrium model as in Bureau and Salvatici (2004 and 2005).

[1] Bound tariffs are the maximum ceiling allowed by the World Trade Organization (WTO) commitments.

[2] With regard to the literature using gravity models comprehensive surveys are provided by Nielsen (2003) and Cardamone (2007).

[3] The 78 ACP countries, mostly former colonies of EU Member States, and the EU preferential relations are governed today by the ACP-EU Partnership Agreement (EPA) aiming to conclude new WTO-compatible trading arrangements, progressively removing barriers to trade and enhancing cooperation in all areas related to trade. However, these preferential relations have always been part of a legally binding international treaty since the Yaoundé Convention signed in 1963, and in 2004 trade preferences applied to 99 per cent of industrial goods and most agricultural products.

[4] For a detailed analysis of these preferential schemes see Bureau *et al.* (2004) and Gallezot (2005).

The index and the model are presented in the following section. Section 3 describes the data, whereas section 4 presents the results and section 5 concludes.

2. Mercantilistic trade preference index

Preferential margins vary a lot across products and countries, so we need an aggregation process to get an overall measure. A major challenge in trade policy analysis is to get the aggregation right. Several forms of aggregation have been used but most of them are without theoretical foundation and lead to biased results (Cipollina and Salvatici, 2008). *Ad hoc* or purely statistical measures provide an answer to the aggregation problem but reflect a lack of clarity about what is being measured. What is needed is a conceptual framework within which the *level* and the *effects* of preferential policy can be combined, and this is what new approaches with rigorous theoretical foundations for the aggregation problem have provided.

A *simple average* of the preference margins implies the same weight for each tariff line regardless of the importance of the product to which the preference is granted. Clearly, this approach makes poor use of information. Some products are more important in world trade than others. Further, it is potentially subject to manipulation. In an extreme example, it would be possible to have zero preferences on a relatively small number of tariff lines regarding the most "sensitive" products and hundreds of tariff lines with large preferential margins: the simple average would be quite high, thus grossly overestimating the real degree of preference granted.

Clearly, trade policies should be weighted by their relative importance in some sense. The simplest and most commonly-used method of doing so is to use actual trade volumes as weights, even if *trade-weighted averages* have major deficiencies in the case of tariffs. As the tariff on one good rises, its imports fall, so the highest tariffs gets lower weights. For high tariffs this fall in the weight may be so large that the index is decreasing in the tariff rate. Apparently, this is not the case for preferential margins, since higher margins are typically associated with higher trade values.

Trade-weighted preferential margins avoid the most obvious shortcoming associated with the use of trade weights: the weights are not biased downwards by preferences and the index is always increasing in each individual preferential margin. But otherwise the case for using it is not compelling, in the absence of an explicit theoretical basis. For instance, import volumes could be much larger than under an MFN regime because preferences are high or they are imposed on highly elastic goods.

A central theme of the economic approach to index numbers is that the choice between alternative index-number formulae should primarily be based not on informal issues of plausibility but

on the extent to which they approximate some "true" or benchmark index, which answers some well-defined economic question (Diewert, 1976). According to Anderson and Neary (1996), a general definition of a policy index is as follows: depending on a pre-determined reference concept, any aggregate measure is a function mapping from a vector of independent variables – defined according to the policy coverage – into a scalar aggregate. The reference concept allows the computation of an index of restrictiveness which is 'equivalent' to the actual policies in terms of the chosen impact and drives the computation of the weights to be used in the aggregation process.

This type of indexes are equivalence measures since they provide results that are equivalent to the original data in terms of the information we are interested in, and several possible reference concepts – such as welfare, income, output – have been proposed in the literature (Cipollina and Salvatici, 2008). Since foreign exporters are concerned with domestic market access, it makes sense to aggregate preferences in a way which holds the volume of imports as the reference standard. Accordingly, our policy index is based on the Mercantilistic trade restrictiveness index introduced by Anderson and Neary (2003).

Taking import flows as the standpoint, the appropriate way of answering the question "How do we measure trade preferences?" is computing the uniform preferential margin which, if applied to all goods, would be equivalent to the actual preferential policies, in the sense of yielding the same volume of imports. The *Mercantilistic Trade Preference Index* (MTPI) is defined in terms of the uniform percentage α to be applied to the maximum applied rates ($\tau^{\max}$) which yields the same volume (at world prices) of tariff-restricted imports as the initial vector of tariffs (*t*). The uniform preferential margin $(1-\alpha)$ generates a counterfactual preferential tariff vector ($\tau = \alpha\,\tau^{\max}$) that yields the same volume (at world prices) of tariff-restricted imports as the initial vector of (nonuniform) preferential margins ($\tau^{max} - t$). This can be expressed with import demand functions *M*, while holding constant the balance of trade function at level B^0:

$$\alpha : M[(1+\alpha\tau^{max})p^*, B^0] = M^0 \qquad (1)$$

where p^* denotes the international price vector of the *K* goods $k = (1, \ldots, K)$ and M^0 is the value of aggregate imports (at world prices) in the reference period.

Define the scalar import demand summing over the *i* exporters:

$$M(p, p^*, B) \equiv \sum_i \sum_k p_{ik} I_{ik}^m \qquad (2)$$

where I^m denotes the uncompensated (Marshallian) import demand function and p is the domestic price vector. Accordingly, the MTPI can be computed by solving the following equation for α:

$$\sum_i \sum_k p_{ik}^* I_{ik}^m [\pi^* (1 + \alpha \tau^{\max})), B^0] = \sum_i \sum_k p_{ik}^* I_{ik}^m [\pi^* (1 + a_k t_k^{\max})), B^0] \quad (3).$$

Indexes such as the MTPI have solid theoretical foundations, although the definition relies on several restrictive assumptions, including the existence of a competitive equilibrium, a single representative consumer, and fixed world prices (i.e., the small country assumption). The latter assumption is particularly questionable, since our empirical analysis deals with such a major trader as the EU. However, the small country assumption helps to guarantee the existence and uniqueness of the indexes, ruling out counterintuitive "second best" results, and it is consistent with a *coeteris paribus* approach (Bureau and Salvatici, 2004).[5]

Having defined the MTPI, for the empirical implementation we follow Bureau and Salvatici (2005) modeling demand through a constant elasticity of substitution (CES) functional form. This function imposes well-known restrictive assumptions on separability and does not properly account for the presence of prohibitive tariffs since if there is no or little trade in the base period there will likely be no or little trade impact of reducing tariffs. In our case, this implies that the impact of the counterfactual uniform percentage reduction is going to be underestimated, and this will lead to an overestimation of the preferential indexes.

Notwithstanding these shortcomings, this functional form has several empirical advantages that explain its use in modeling import demand (Winters, 1984). If the utility function is homogeneously separable, commodities may be consistently aggregated (Gorman, 1959). That is, one may form composite commodities which may be treated in the same manner as the primary commodities. Accordingly, we assume that the overall basket of goods can be partitioned into J aggregates denoted $j = 1, \ldots, J$, and the utility function of the representative consumer can be written as

$$U = \phi\left(u_1(x_1), \ldots, u_J(x_J)\right), \quad (4)$$

where ϕ is continuous, twice differentiable, and strictly quasi concave, and the u_i are continuous, twice differentiable functions, homogeneous of degree one (Lloyd, 1975).

In our application, we assume that u_j is a CES function in x_j. Since the import volume function is homogenous of degree zero in the prices of traded goods, uniform tax would be equivalent to free

[5]Anderson and Neary (2003), argue (footnote 8) that "there is a rationale for a ceteris paribus trade restrictiveness index that fixes world prices even when these prices are in fact endogenous". Such a rationale may be represented by the fact that, by keeping world prices constant, we focus on the component of protection explained by national policies, and not by the degree of market power of the country.

trade in terms of imports.[6] Using the popular Armington (1969) assumption that imports are imperfect substitutes for domestic goods, we solve the problem by taking the domestic good as the *numéraire* (Bach and Martin, 2001).

We partition the consumption vector x_j within the *j*th group into an aggregated domestic good denoted with a suffix *d* and N_j *-1* traded goods denoted with an index *i*:

$$u_j = \left(\beta_{dj} \left(x_{dj} \right)^{\rho_j} + \sum_i \beta_{ij} \left(x_{ij} \right)^{\rho_j} \right)^{\frac{1}{\rho_j}} \qquad (5).$$
$$i = 1,..., N_j$$

Denoting $\sigma_j = \frac{1}{1-\rho_j}$ (the elasticity of substitution within the *j* group), the expenditure devoted to each aggregate *j* is:

$$e_j(p,u) = \left(\beta_{dj} \left(p_{dj} \right)^{1-\sigma_j} + \sum_i \beta_{ij} \left(p_{ij} \right)^{1-\sigma_j} \right)^{\frac{1}{1-\sigma_j}} u_j \qquad (6).$$

The parameters β_{ij} can be calibrated to the initial values of the expenditure shares in the base data, when all domestic prices are set to 1. After deriving the indirect utility function by inverting equation (6), the Marshallian demand functions of each of the *k=1,..,* N_j *-1* imported goods can be found by Roy's identity:

$$x_{kj} = \beta_{ij} \frac{p_{kj}^{-\sigma_j}}{\left(\beta_{dj} \left(p_{dj} \right)^{1-\sigma_j} + \sum_k \beta_{kj} \left(p_{kj} \right)^{-\sigma_j} \right)} e_j \qquad (7).$$

Denoting P_j the price index that corresponds to the denominator of the right-hand side, the import volume function for the *j*th aggregate, valued at world prices, is:

$$\sum_i p_{kj}^* x_{kj} = \sum_i p_{kj}^* \beta_{kj} \left(\frac{1}{P_j \cdot p_{kj}^{\sigma_j}} \right) e_j \qquad \text{with } k=1,\ldots, N_j-1 \qquad (8).$$

[6]More generally, Neary (1998) shows how the failure to select a reference untaxed good leads to misleading results in the theory of trade policy.

When the initial total expenditure e_j^0 (expenditures on both domestic and imports in *j*) is used in expression (8), we obtain the demand function at the initial level of imports.

The MTPI α_j for each sector *j* is found by setting the value of the import volume function with the uniform preferential margin equal to the initial value of imports (evaluated at world prices):

$$\sum_k p_{kj}^* \beta_{kj} \left(\frac{P_j^\tau}{p_{kj}^* \left(1+\alpha_j \tau_j^{\max}\right)} \right)^{\sigma_j} e_j^0 = \sum_k p_{kj}^* I_{kj}^0 \tag{9}$$

where I_{kj}^0 are the volumes of imports in the initial period (i.e., 2004 in our application), and P_j^τ is the price index:

$$P_j^\tau = \left(\beta_{dj} (p_{dj})^{1-\sigma_j} + \sum_k \beta_{kj} \left(p_{kj}^* \left(1+\alpha_j \tau_j^{\max}\right) \right)^{1-\sigma_j} \right)^{-\sigma_j} . \tag{10}$$

The uniform preferential margins for each aggregate commodity *j* are found using an optimization routine in the GAMS package (Brooke et al., 1998), solving for α_j in equations (9) and (10). The overall MTPI can be obtained by modifying equation (9) as follows:

$$\sum_j \sum_k p_{kj}^* \beta_{kj} \left(\frac{\left(\beta_{dj} (p_{dj})^{1-\sigma_j} + \sum_k \beta_{kj} \left(p_{kj}^* \left(1+\alpha \tau_{kj}^{\max}\right) \right)^{1-\sigma_j} \right)^{-\sigma_j}}{p_{kj}^* \left(1+\alpha \tau_{kj}^{\max}\right)} \right)^{\sigma_j} e_j^0 = \sum_j \sum_k p_{kj}^* I_{kj}^0 \tag{11}$$

i.e. summing up over all *J* sectors. The MTPI indexes are by themselves relevant for the analysis of trade policy. In addition, they can be used as inputs in any analysis with a commodity aggregation and an import demand structure consistent with our assumptions. However, it should be recalled that they are only an approximation of the 'true' (i.e., general equilibrium) MTPI indexes.

In the policy literature attempting to describe the preferential policies, four issues are most relevant (Hoekman and Ozden, 2005):

- preferential margins: the difference between MFN and preferential tariffs applied to each product;

- potential coverage: the ratio between the value of products covered by a preferential scheme and the value of dutiable imports originating in beneficiary countries;
- utilization: the ratio between the value of imports actually receiving preferential treatment and that of eligible imports in principle covered;
- utility: the ratio of the value of imports that get preferences to all dutiable imports from that exporter.

As far as the *preferential margin* is concerned, we compute the margin for each product on a bilateral basis as the difference between the maximum applied duty by the EU across all exporters and the actual duty faced by each exporter. This means that we do not care about the difference between multilateral, bound tariffs and bilateral, applied duties; rather we focus on the actual preferential margins with respect to possible competitors. Accordingly, we avoid an overestimation of the competitive advantage enjoyed by the exporting country, as it would be the case if the highest applied duties are lower than the maximum ceiling allowed by the WTO commitments.[7] On the other hand, the impact of prohibitive tariffs may be underestimated, since we consider only actual not potential exporters.

Our import demand system is not limited to the preferential imports and the volume of imports (I_{ij}^0) referred to in the equation (9) includes both the preferential and MFN imports. However, it is still useful to compute an index limited to preferential imports (*preferential-MTPI*) that can be compared with the traditional trade-weighted preferential margins in order to have an idea of the relevance of the pure *aggregation bias*. For example, if we consider two sectors characterized by the same preferential margins and preferential trade volumes, the preferential-MTPI would be the same, but the relevance of the preferential policies may be quite different according to the relevance of preferential trade on the overall trade flows.

We are not able to deal with the *potential coverage* since we have no information about each specific preferential scheme, while *utility* is considered since the *MTPI* calculation takes into account the volume of trade that actually benefits from the preference. In this respect, the MTPI provides a much more satisfactory picture, since it would be equal to the preferential MTPI if all trade was preferential, but it would decrease with the share of preferential imports with respect to total trade. In our example, although the preferential-MTPIs were equal by construction, the MTPI would rightly signal what is the sector were preferences are less relevant due to lower potential coverage or lack of

[7]For instance, according to our definition the simple average absolute preferential margin granted by the EU is equal to 2 percentage points, whereas when it is computed as the difference between the MFN and the applied tariffs the figure would be two times larger.

utilization. It is also worth noting that the while the MFN duty-free sectors do not affect the preferential MTPI measure, they are included in the MTPI computation, contributing to lowering the assessment of the preference intensity and correctly signaling the lower utility due to a lower share of preferential imports. In the same vein, in order to shed some light on the relevance of the utilization issue, we will also compute a *potential-MTPI* assuming that all imports paid the preferential duty.

Finally, it is worth recalling that the same relative percental margin (α) implies very different duty reductions according to the initial tariff levels. In order to express the margin in (absolute) percentage points terms, we refer the percental margin to the corresponding MTRI uniform tariffs (τ) computed as in Bureau and Salvatici (2005). For example, if $\tau = 40$ and $\alpha=0.7$, the relative preferential margin corresponds to 17.1 (40/0.7 – 40) percentage points.

3. Data

We consider 5212 products at the 6-digit level of the Harmonized System (HS) classification from 162 exporters to the EU (15 countries). Tariffs are taken from the most recent version of MAcMap-HS6 database[8]. Trade flows are from the Eurostat database Comext[9]. Information on the elasticities of substitution σ and the domestic expenditures is from the Version 7 of the GTAP dataset (Naranyanan and Walmsey, 2008). All data – i.e., tariffs, trade and domestic expenditures, elasticities – refer to 2004.

We aggregate the 283,187 EU tariff lines associated with positive trade flows up to the 44 commodity sectors included in the GTAP database. It is worth recalling that the number of tariff lines in each commodity aggregate is very uneven (Table 1). Although, there is little justification for putting much faith in the GTAP elasticities, providing new estimates is certainly beyond the scope of this work. However, we undertook sensitivity tests to examine the effects of different elasticity values on the measurement of the MTPI.

The Eurostat COMEXT database contains trade data distinguished by tariff regimes as reported by the EU member states. Using the information about the preferential trade flows, the applied duty (t) used for the computation of the MTPI is equal to the "MFN (applied) tariff" if the preference is not used and to the "preferential (bilateral) tariff" otherwise. Accordingly, our MTPI calculation takes into account the volume of trade that actually benefits from the preference.

[8]MAcMap provides a consistent assessment of protection across the world, including *ad valorem* equivalent rates of applied tariff duties and tariff rate quotas at the six-digit level of the Harmonized System (http://www.cepii.fr/).
[9]The Comext database (http://fd.comext.eurostat.cec.eu.int/xtweb/) contains detailed foreign trade data distinguished by tariff regimes as reported by the EU member states.

Figure 1 shows that more than 60% of our tariff lines with positive trade flows enjoy preferential access, and 80% of them are actually used; while 22% of the tariff lines are MFN-duty free. Some GTAP sectors[10] do not include any positive duties: since in these sectors all preferential margins are (obviously) equal to zero, they are not reported in the tables presenting the results.

The comparison between preferential and MFN applied duties provides a rough picture about the relevance of the administrative burdens associated with the preferential schemes (Table 1). Taking into account the duty actually paid, Table 1 shows that in several instances the average paid rates are closer to the MFN rather than to the preferential ones. This is especially true in the case of grains, dairy products and meat. In these sectors, then, we may suspect that traders do not take advantage of the right to sell into a partner market at a reduced duty because of restrictions on rules of origin or high administrative costs involved in securing preferential treatment relative to the cost of paying the MFN tariff. In order to shed some light on the relevance of the utilization issue, we compare the MTPI with the *potential-MTPI* computed under the assumption that all eligible imports paid the preferential duty.

Looking at the trade flows data (Table 2), it appears that preferential flows represent 14% of total EU imports (most of them duty fee). However, if we exclude the large share of MFN duty free flows, where preferences are not possible, the share of preferential trade is roughly a third. Preferential imports are more relevant for agrifood and textile products, and this is consistent with the EU tariff structure: the most protected sectors, as a matter of fact, are those where preferences are (at least in principle) more relevant.

4. Results

We start comparing the results for the preferential-MTPI with those provided by the two most common preferential margins aggregators: the simple and trade-weighted averages (Table 3). As it was mentioned in the previous Section, such a comparison gives an idea of the relevance of the pure *aggregation bias*. As expected, the MTPI margins are positively correlated with the averages, though the sector ranking is not the same especially when margins are large.

The trade-weighted average clearly outperforms the simple one in its ability to mimic the MTPI results. This is consistent with the results by Anderson and Neary (2003 and 2005) and Bach and Martin (2001), showing that the trade-weighted average tariff is a linear approximation to the tariff aggregator based on the expenditure function, while the simple mean is a pure statistical construct.

[10]Coal; Electricity; Gas; Gas manufacture, distribution; Oil; Oil seeds; Plant-based fibers; Wool, silk-worm cocoons.

As it could be expected (Bureau and Salvatici, 2005), the MTPI and the trade-weighted average are closer when the number of tariff lines in the aggregate is small, or when there is little dispersion in margins within an aggregate, whereas larger differences emerge when the number of tariff lines is higher (see for example textiles and textile articles). Consistently with the findings by Anderson and Neary (2003), the MTPI uniform percentage reductions (α) always exceed the trade-weighted ones. In terms of preferential margins, this means that the trade-weighted average always overpredicts the MTPI value, with differences ranging from 1 to 9 (in the case of processed rice) percentage points. The overall preferential-MTPI is rather large (76%), but it turns out to be much lower in the case of agriculture (64%) with respect to the other sectors (84%). This is quite an interesting result, since the agricultural products are often the most important exports for the developing countries and present much higher duties (see Table 1).

The MTPI margins for different sectors are presented in Table 4. As expected, they are significantly lower than the preferential-MTPI margins presented in Table 3. The overall MTPI margin granted by the EU is 28%, but there are large differences across sectors. The agricultural sector is far above the average with a margin equal to 38%, with the highest percentages in the case of wheat and sugar (65 and 63%, respectively). On the contrary, most industrial sectors present much lower figures (the overall margin is 25%), with a minimum equal to 9% in the case of electronic equipment. The comparison between agricultural and non-agricultural sectors in terms of the MTPI results provides a completely different picture with respect to the preferential-MTPI results, and makes clear the different meaning of the two indexes. If we only take into account the preferential imports, non-agricultural preferences exceed the agricultural ones, but if we consider the relevance of these preferential trade flows with the non-preferential ones we get the opposite result.

The two possible measures of the preferential margins (relative and absolute) are obviously related, so the sectors above the average in terms of the MTPI also present quite substantial absolute margins, as in the case of processed rice (98), sugar (83), vegetables (61), beverages (58)[11], wheat and meat (both 45). Notwithstanding the large absolute margin (35 points), still the primary sectors remain by far the most protected since the MTRI uniform tariff is almost twenty times larger than in the case of the non-agricultural sector.

Table 4 reports the results for the potential-MTPI margins. Although this index is likely to underestimate the impact of the regulations that do not allow a full exploitation of the existing

[11] The beverages and tobacco sector presents a very high MTRI uniform tariff (337%). This is due to the existence of some specific tariffs leading to *ad valorem* equivalents exceeding 500%.

preferences, since trade volumes may have been even larger than the actual ones, the comparison with the MTPI margins is quite revealing. The largest differences, as a matter of fact, regard the animal sectors – cattles, meat and dairy products – that are quite heavily regulated in terms of sanitary and phyto-sanitary measures. The other sectors presenting large differences are some traditional manufactures – such as textiles and apparels – or more advanced sectors such as chemical, rubber and plastic products: in these case, explanations may be due to the rules of origin requirements.

Figures 2 and 3 combine the MTPI and the absolute preferential margins, while the size of the balls is proportional to the share of trade of each sector. As far as the agricultural products are concerned (Figure 2), sectors with relative and absolute margins higher than the average (wheat, processed rice, sugar) represent tiny shares of trade, with the only exception of vegetables and fruit (18% of total agricultural trade). The largest traded sector, food products, has an MTPI above the average, though the absolute preference margin is relatively small (17 points). In the case of the non-agricultural sectors (Figure 3), even large values in terms of the MTPI correspond to quite low figures in terms of absolute margins: the only exceptions are textiles and wearing apparels.

Table 5 presents the results by exporting regions. As expected, given the attention paid by the EU to the so-called "neighborhood policy", the European countries benefits from the largest margins (69% overall). The second most preferred region is Africa (56% overall margin) that includes many members of the Generalized System of Preferences (and more recently of the Everything But Arms initiative) as well as of the Africa-Caribbean-Pacific (ACP) agreement. The third is South-America (45% overall), where the EU has been rather active in signing reciprocal agreements with different countries or regional blocs, such as the Mercosur.

The remaining three regions are characterized by much lower overall margins, ranging from 9% of North America, to 21% of the Pacific area. This is not surprising, since North America includes some of the few countries subject to the EU MFN rates, such as USA and Canada. However, for some products, such as wheat, also these countries may register positive margins. This is due to the fact that our database also includes exporters that are not WTO-members: in such a case, then, the MTPI measures the benefit of WTO membership.

In the case of the Pacific area, many (small) countries are members of the ACP agreements, but the largest economies (Australia, New Zealand) do not get any preferences. More surprising may be considered the rather low level of the overall Asian preferences (17%), since this area includes some prominent developing economies, such as India and China. However, only recently the EU has

undertaken bilateral negotiations with some countries of the region, such as India and South Korea: in 2004, these countries were relatively worse off in terms of access to the EU market.

It is worth recalling that African and South-American exporters, though enjoying rather large preferences, have very low shares of EU imports: 9% and 6%, respectively. Asian and North-American countries, on the contrary, register larger shares (53% and 16%, respectively) notwithstanding the lack of significant preferences. Apparently, trade preferences are neither a necessary nor a sufficient condition to get into the EU market (Figure 4). On the other hand, the grant of the most generous margins to the least efficient exporters is not only a consequence of the "aid through trade" approach, but it may also be consistent with a political economy explanation of the EU choices since it would not bother (too much) the domestic producers.

Finally, we turn to a sensitivity analysis of our simulation results, in order to check to what extent the assumed values of the substitution elasticities affect the MTPI computation. Even though the elasticities extracted from the GTAP dataset are widely used by applied analysts, their relevance is questionable. For instance, there are several reasons to believe that the GTAP elasticities are low, compared to what is consistent with recent econometric estimates of import elasticities (see e.g., Erkel-Rousse and Mirza, 2002; Hummels, 1999).

In order to assess the sensitivity of the results to the choice of the parameters of the CES function, we computed the MTPIs making different assumptions about the values of the substitution elasticities (Table 6). The elasticities are assumed to range from one-third to three times the original values. Even though the ranking of different sectors does not change, the MTPIs are obviously quite sensitive to the degree of substitution between products, a finding consistent with the results obtained by Bureau and Salvatici (2005). An increase in the elasticity of substitution leads to lower values of the overall-MTPI index, which decreases from 34% to 24%, since lower margins are required in order to generate the same trade volumes if the products are more similar from the consumer point of view. Such a result is confirmed both for agricultural and non-agricultural sectors.

5. Conclusions

Over the last decade, there has been a great deal of interest in how to measure the openness of developed countries' markets *vis-à-vis* developing countries exports. In this article, we provide a summary measure of the EU preferential policies, taking into account the different margins in a large number of tariff lines. We build on the work of Anderson and Neary developing a Mercantilistic trade preference index (MTPI) with a firm foundation in economic theory and that can be actually computed.

The MTPI is defined as the uniform scaling factor applied to the maximum levied tariffs that would produce the same effect on imports real income as the importing country's preferential tariff structure. The computation is carried out using the same approach as Bureau and Salvatici (2005) that makes some simplifying assumptions, but does not require a CGE model.

From the methodological point of view, the MTPI uniform preferences and the trade-weighted margins tend to move closely together when the number of commodities is small, and when the dispersion of margins is low. However, the trade-weighted aggregator overestimates the true preferential margin as measured by the MTPI.

Even if the preferential-MTPI provides a theoretically consistent aggregation of individual preferential margins, it tends to overestimate the relevance of preferential policies since it does not take into account the relevance of preferential trade. Accordingly, the MTPI computed taking into account total trade flows provides a more realistic assessment of the policies under consideration.

In terms of the MTPI, the overall margin granted by the EU is around 28%, corresponding to 2.5 percentage points in absolute terms. There are large differences across sectors, though. The agricultural sector is far above the average with a margin equal to 38%, with the highest percentages in the case of wheat and sugar (65 and 63%, respectively). On the contrary, most industrial sectors present much lower figures (the overall margin is 25%), with a minimum of 9% in the case of electronic equipment.

Looking at the exporting regions, it emerges that in addition to the neighbour countries, the EU preferential policies are obviously targeted to poor regions such as Africa and South-America, while Asian countries seem to be less favoured on average. Our results show that theoretically consistent preferential policies aggregation is possible if we are willing to impose some structure on the importing country behaviour. However, the results are inherently sensitive to assumptions regarding the elasticity of substitution, on which there is still too little reliable information available.

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TABLES

Table 1: EU tariff structure.

GTAP sector (ordered from the most to the least protected)	*Number of tariff lines*	***MFN duty (simple mean, %)***	***Preferential duty* (simple mean, %)***	***Paid duty** (simple mean, %)***
All products	283187	**7**	**3**	**5**
Agricultural sector	37210	**24**	**16**	**20**
Beverages and tobacco products	2866	144	117	132
Processed rice	250	62	43	61
Sugar	273	51	35	42
Paddy rice	159	43	30	39
Bovine meat prods	364	43	17	35
Dairy products	566	43	24	38
Bovine cattle, sheep and goats, horses	162	20	4	11
Meat products n.e.c.	643	17	10	15
Food products n.e.c.	17566	17	9	12
Cereal grains n.e.c.	237	16	9	14
Wheat	59	15	8	14
Animal products n.e.c.	1456	10	6	9
Fishing	1571	10	3	5
Vegetable oils and fats	1317	9	5	7
Vegetables, fruit, nuts	4704	8	3	6
Crops n.e.c.	3939	6	2	4
Forestry	1076	1	0	1
Non-agricultural sector	245051	**4**	**1**	**3**
Wearing apparel	23707	11	4	8
Textiles	27887	8	3	5
Leather products	9092	7	2	5
Motor vehicules and parts	4879	6	2	5
Chemical, rubber, plastic products	33189	4	1	3
Mineral products n.e.c.	10247	4	1	3
Metals n.e.c.	5386	4	1	3
Metal products	16088	3	1	2
Transport equipment n.e.c.	3985	3	1	2
Electronic equipment	11711	3	1	2
Manufactures n.e.c.	11776	3	1	2
Wood products	8143	2	1	1
Petroleum, coal products	1295	2	0	2
Machinery and equipment n.e.c.	62382	2	0	2
Ferrous metals	6724	1	0	0
Minerals n.e.c.	2285	0	0	0
Paper products, publishing	6275	0	0	0

Others	926	0	0	0

*Notes: *Preferential duty granted by EU; **Paid duty according to tariff regime used.*

Table 2: EU Imports (year 2004)

Sample of positive trade *(ordered by the highest to the lowest % of total trade)*	***Total Imports (MI $)***	***MFN duty free (%)***	***MFN duties (%)***	***Preferential duties (%)***	***Preferential duty free (%)***
All products	869,193	57	29	2	12
Agricultural sector	63,160	33.4	39.8	9.6	17.2
Food products n.e.c.	18,344	7.2	39.5	19.1	34.2
Vegetables, fruit, nuts	11,266	36.4	40.2	10.1	13.4
Crops n.e.c.	8,062	68.6	15.7	2.0	13.8
Vegetable oils and fats	7,420	68.5	22.5	5.2	3.8
Beverages and tobacco products	4,031	24.9	59.4	10.4	5.4
Bovine meat prods	2,176	1.9	93.4	3.3	1.3
Fishing	2,074	7.9	58.3	7.0	26.8
Forestry	1,958	87.8	6.9	1.4	3.9
Animal products n.e.c.	1,680	80.5	16.6	0.0	2.9
Meat products n.e.c.	1,488	19.0	76.2	0.9	3.8
Sugar	1,339	0.0	57.2	0.0	42.8
Wheat	1,002	0.0	99.8	0.0	0.2
Cereal grains n.e.c.	787	13.8	85.0	0.3	0.9
Dairy products	701	0.0	59.5	29.4	11.1
Bovine cattle, sheep and goats, horses	480	72.8	14.4	2.6	10.2
Paddy rice	234	0.0	98.3	1.6	0.1
Processed rice	119	0.0	99.5	0.0	0.5
Non-agricultural sector	662,171	49.6	34.6	2.2	13.6
Electronic equipment	130,558	86.7	11.8	0.3	1.2
Machinery and equipment n.e.c.	118,863	31.3	49.0	0.4	19.2
Chemical, rubber, plastic products	95,891	44.0	43.0	1.8	11.2
Wearing apparel	34,925	0.1	62.2	6.8	31.0
Motor vehicules and parts	30,517	0.2	73.9	3.0	22.9
Metals n.e.c.	29,531	64.9	15.7	1.3	18.1
Transport equipment n.e.c.	29,225	66.3	28.2	2.2	3.3
Textiles	29,162	1.7	49.7	13.5	35.2
Manufactures n.e.c.	25,448	42.0	46.5	0.4	11.1
Petroleum, coal products	24,839	73.2	11.1	0.0	15.7
Minerals n.e.c.	22,378	99.4	0.3	0.0	0.3
Ferrous metals	20,252	81.4	6.5	1.0	11.1
Wood products	17,859	71.6	12.9	1.5	14.0
Leather products	16,725	5.6	64.0	13.6	16.9
Metal products	15,732	13.5	61.5	0.7	24.3
Paper products, publishing	12,664	99.1	0.3	0.0	0.6
Mineral products n.e.c.	7,600	12.8	51.7	6.1	29.5
Others	143,863	100.0	0.0	0.0	0.0

Table 3: Preferential-MTPI, simple and weighted average preferential margins

Sectors (ordered for the highest share of preferential trade)	*Preferential-MTPI margin (1-α), %*	*Weighted mean margin, %*	*Simple mean margin, %*	*Number of HS_6 tariff lines*
All products	**76**	**78**	**77**	**72397**
Agricultural sector	**64**	**65**	**68**	**11564**
Beverages and tobacco products	25	28	52	388
Food products n.e.c.	80	83	70	6903
Processed rice	61	70	73	13
Fishing	88	88	88	633
Vegetables, fruit, nuts	84	87	85	1678
Crops n.e.c.	89	91	81	1041
Bovine cattle, sheep and goats, horses	94	96	87	32
No-Agricultural sector	**84**	**87**	**84**	**60833**
Textiles	76	80	73	10643
Wearing apparel	82	86	78	9038
Mineral products n.e.c.	84	85	86	3445
Leather products	58	61	84	3125
Motor vehicules and parts	88	89	92	1398
Metal products	98	98	96	4623
Machinery and equipment n.e.c.	99	99	97	12762

Table 4: Relative, absolute and potential-MTPI preferential margins

Sectors	*MTPI margin (1-α), %*	*MTRI applied uniform tariff, %*	*Absolute preference margin*	*Potential MTPI margin (1-α), %*
All products	**28**	**6.4**	**2.5**	**41**
Agricultural sector	**38**	**59**	**35**	**47**
Animal products n.e.c.	8	60	5	31
Beverages and tobacco products	14	343	58	16
Bovine cattle, sheep and goats, horses	47	6.7	6	88
Bovine meat prods	35	85	45	62
Cereal grains n.e.c.	25	21	7	30
Crops n.e.c.	38	2.5	1.5	48
Dairy products	35	69	37	54
Fishing	53	3.4	4	57
Food products n.e.c.	47	19	17	57
Forestry	36	0.2	0.1	48
Meat products n.e.c.	20	36	9	22
Paddy rice	24	74	23	29
Processed rice	61	63	98	61
Sugar	63	48	83	66
Vegetable oils and fats	23	5.2	2	26
Vegetables, fruit, nuts	60	41	61	67
Wheat	65	24	45	66
Non-agricultural sector	**25**	**3**	**1**	**39**
Chemical, rubber, plastic products	22	2.4	0.7	38
Electronic equipment	9	1.5	0.2	20
Ferrous metals	63	0.3	0.5	80
Leather products	19	6.7	1.5	26
Machinery and equipment n.e.c.	26	1.5	0.5	38
Manufactures n.e.c.	16	1.8	0.3	25
Metal products	27	2.2	0.8	34
Metals n.e.c.	50	1.1	1.1	68
Mineral products n.e.c.	31	3.2	1.4	42
Minerals n.e.c.	61	0.01	0.02	73
Motor vehicules and parts	18	6.6	1.4	30
Paper products, publishing	67	0.01	0.02	75
Petroleum, coal products	61	0.4	0.6	84
Textiles	34	6.2	3.2	53
Transport equipment n.e.c.	10	1.6	0.2	15
Wearing apparel	27	8.2	3	43
Wood products	45	0.8	0.7	59

Table 5: Relative preferential margins (1 - α) for exporting regions (%)

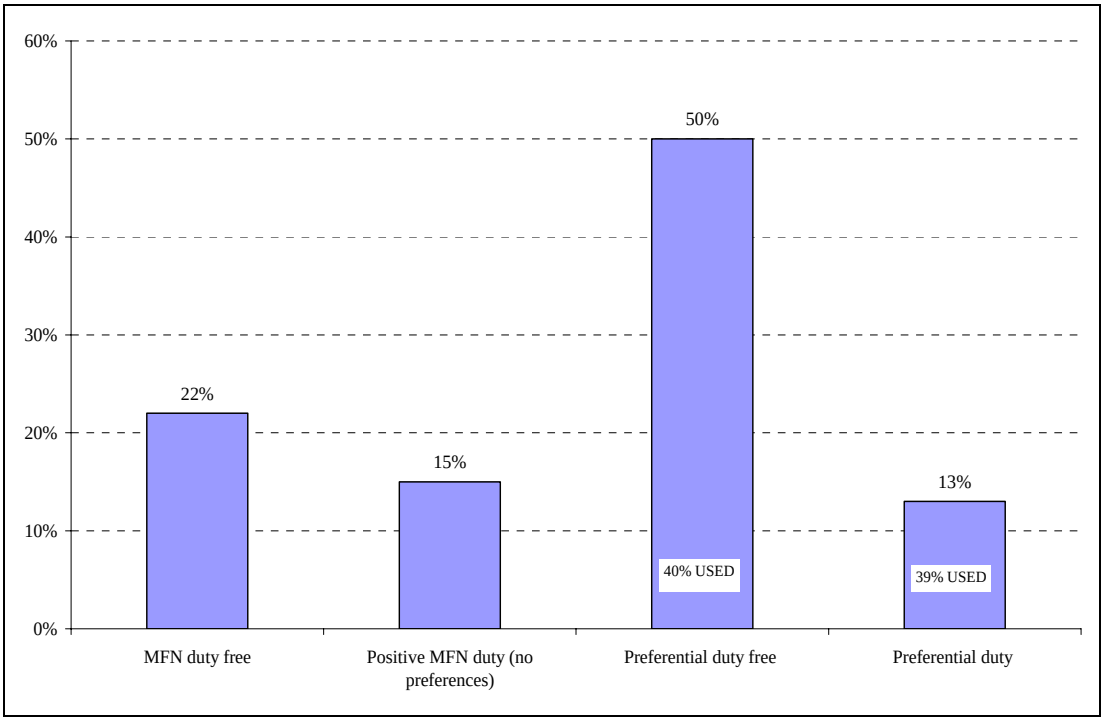
Sector	*Africa*	*Asia*	*Europe*	*North-America*	*Pacific*	*South-America*
All products	56	17	69	8	21	45
Agricultural sector	48	33	56	32	43	50
Non-agricultural sector	66	15	74	3	6	43

Table 6: Sensitivity of the Preference Margin Sensitivity to changes in the elasticities of substitution σ_j (%).

Sector	*0.3* σ_j*	*1.3* σ_j*	*2* σ_j*	*3* σ_j*
All products	**34**	**28**	**26**	**24**
Agricultural sector	47	41	38	36
Non-agricultural sector	28	24	22	21

FIGURES

Figure 1: Shares of bilateral EU tariff lines by type of tariff regime (2004)



Source: Authors using dsta from MacMap and Comext (2004).

Figure 2: Preference Margins and shares of trade (agricultural sector)

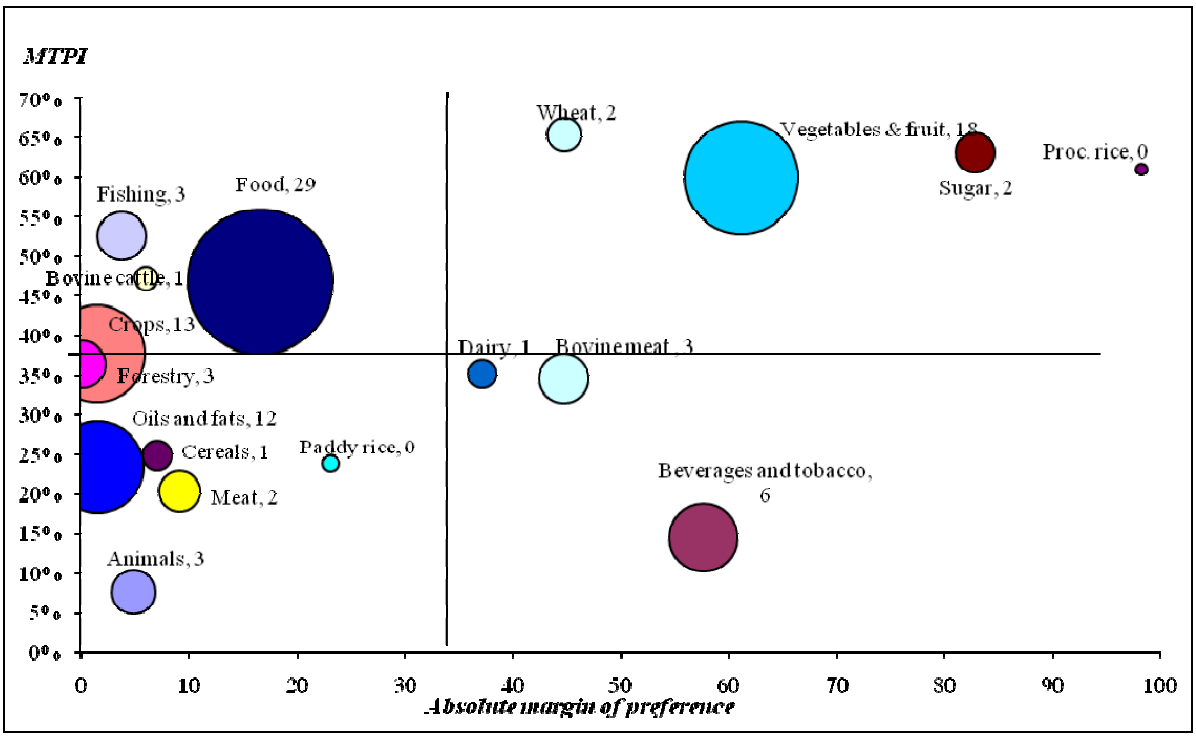


Figure 3: Preference Margins and shares of trade (non-agricultural sector)

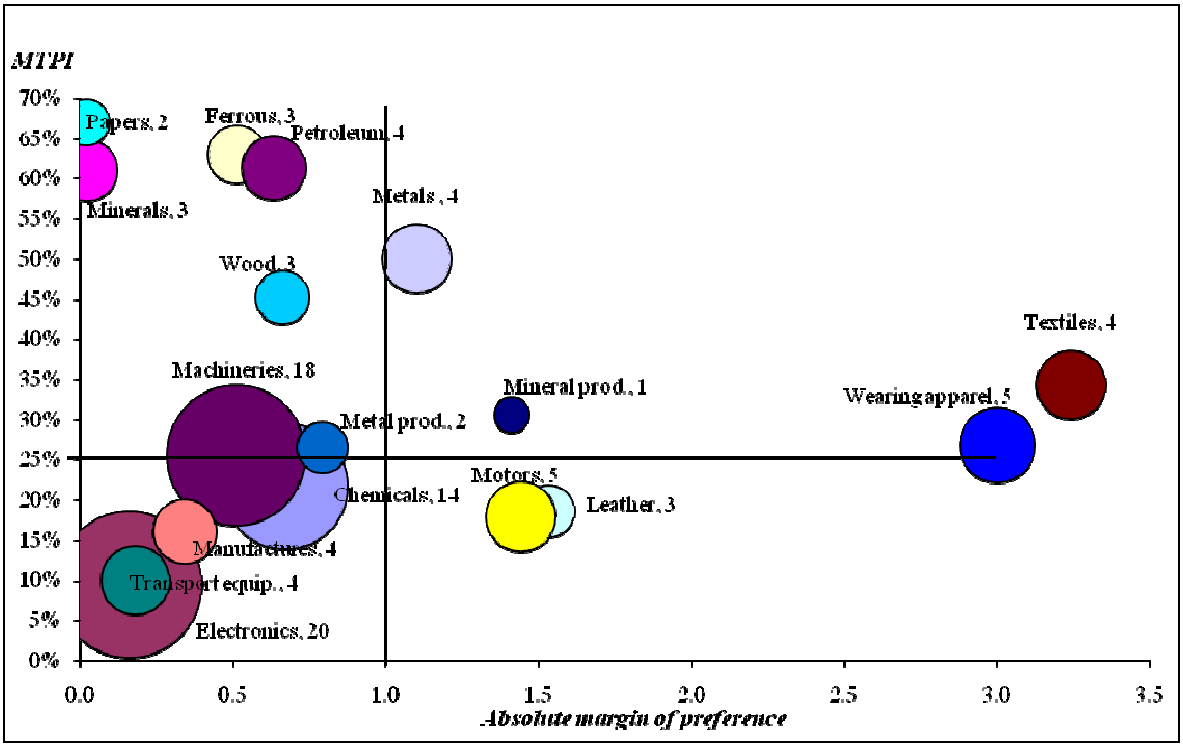
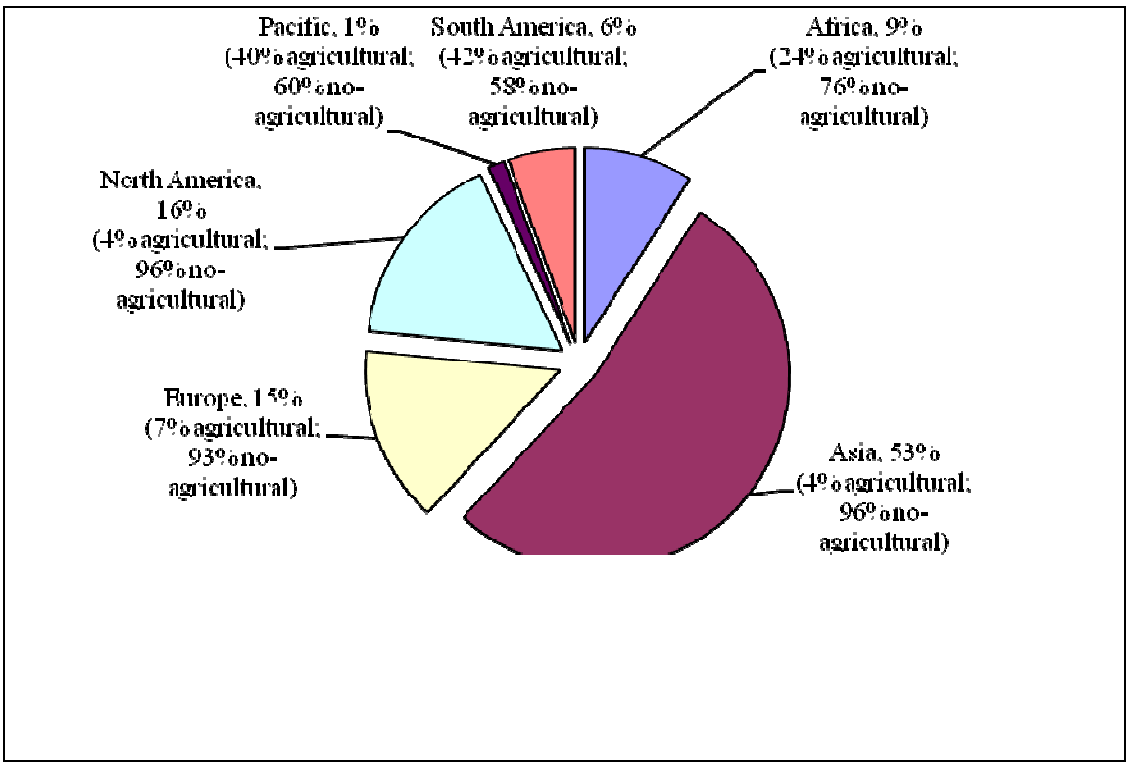


Figura 4: Composition of EU imports by regions.



Source: Comext (2004).