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THE EU-MERCOSUL FREE TRADE AGREEMENT: QUANTIFYING MUTUAL GAINS[#]

GERMAN CALFAT *

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Abstract

We identify trade in goods opportunities in a EU-Mercosul free trade area. Gains for Mercosul are rather concentrated, being mostly associated to a few agricultural commodities nowadays facing high protection barriers. EU gains are evenly spread, comprising a variety of market penetration possibilities. Trade deviation by the EU products is *never* higher than trade creation, confirming their international competitiveness and signalling that a great distortion of Mercosul's imports won't take place. Balanced gains exist for both sides; for Mercosul, the agreement can act as a first serious trial for future liberalisations with other developed partners, and as a warning on needed competitiveness improvements.

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THE EU-MERCOSUL FREE TRADE AGREEMENT: QUANTIFYING MUTUAL GAINS

Introduction

In the very year of its historical enlargement to the East, the European Union (EU) sat, for the third time, at the negotiating table with Latin American (LA) leaders, in the city of Guadalajara, Mexico. If it is undeniable that, after each of the two past *Cumbres* – Rio, June 25-26; 1999 and Madrid, May 17-18; 2002 -, some progress has always been achieved, diplomats and agents from both sides are still at odds in deepening a supposedly strategic partnership that often reveals itself unable to move beyond sheer rhetoric.

Reasons for the impasses and disappointments are numerous, but surely the diversity, *in all aspects*, of both regions and their different sets of priorities can account for a large part of the relatively modest results achieved until now. Economic motives, more than any others, have sometimes made the two parties act faster, and close deals as the EU-Mexico Free Trade Agreement (Lisbon, March 23; 2000) and the EU-Chile Association Agreement (Brussels, November 26; 2002). It is no wonder that these treaties were the result of negotiations with a *single* Latin American country, what considerably simplified the agenda.

Another agreement has seen its proceedings linger on at least since November 1999, when the EU-Mercosul Co-operation Council met in Brussels. Truly, the stakes are higher in this case. The partner is a common market initiative, actually – under a variety of aspects - *the* regional integration that bears more affinities with the European project, and represents a rather sizeable part of South America. Two big economies and large countries, Argentina and Brazil, figure as members of the bloc, a region that includes key geographic

systems in the continent: the Rio de la Plata basin, the Pantanal and (the largest part of) the Amazon forest.

Fixing the EU-Mercosul Agreement would mark a turn in the EU-LA relations, signalling that the two sides *want and can* deepen their relationship. The economic and strategic importance of Mercosul and the historical times the EU is now living add an extra international impact to this decision. But can negotiators in both sides perceive this, and go beyond their minor disagreements and limited concessions ?

The present study unveils potential gains, as relates to trade in goods flows, supposing full liberalisation takes place. Instead of resorting to (the always necessary) global evaluations, that produce aggregate figures useful at certain, well-defined stages of the negotiations, we opted for a detailed analysis, at the product level, in which the gains for specific agents become clearer. As the next sections show, gains lie waiting, in both sides, for the signing of the Agreement. They ran from reasonable to extremely attractive and, especially for the EU, don't look at all disruptive. The inability to realise them will put businesses in a situation similar to the one at the time of the Europe 92 Initiative, turning benefits into *costs for not signing the Agreement*.

The paper is organised as follows: in section 1 we discuss the methodology and its limits, while section 2 offers a detailed view of the results. A more encompassing perspective is adopted in section 3, while section 4 concludes.

1. The Limits of the Study.

We concentrate on the trade in goods aspect of the liberalisations envisaged. Negotiations in course comprise also other areas, notably services and government procurement. However, goods make for the basic flows in international trade and act as a catalyst for other exchanges, specially services. Moreover, those two additional issues are where more conflict exists, basically due to a *demandeur* position by the European Commission (EC), while

Mercosul shows a rather defensive attitude. As a consequence, it is more difficult to outline feasible liberalisation scenarios, not to say quantify them.

We worked with products at the six-digit level of the Harmonised System (HS). Though the official offers from both sides are systematically made at the eight-digit level, this was thought to produce an excessive level of detail, blurring the impact of our main goal: to identify market access opportunities for specific agents/firms in the two blocs. The six-digit level already conveys this information to the local producers concerned.

Though we use standard trade-analytic tools, the way they are combined makes for a somewhat *novel methodology*. The Annex explains in more detail, with all main equations, the analytic tools and the steps required for arriving at the final results. For interpreting the findings, it suffices to understand the following:

Based on statistics for the recent trade flows we select, for each side, products for which prospective gains lie with the agreement. Such possibility is attributed to a product if it satisfies three requirements:

- i) complementarity between one bloc as exporter and the other as importer;
- ii) world comparative advantage (for the exporting bloc);
- iii) the tariff equivalent the product faces at the importing bloc is equal or superior to 10 per cent.

Informally, if the product “scores high” in the three dimensions above, it qualifies for *prospective gains with the agreement*. Trade indexes are used for assessing the first two requirements; as for the last one, we computed, in an as-best-as-possible way, tariff equivalents to the barriers faced by the exports. Ideally, these equivalent values include tariff and non-tariff barriers actually practised by the two partners.

For each identified product, we produce a US dollar value that portrays the market access gains. This “total value” results from adding up two effects, trade creation and trade diversion, related, though not exactly, to the well-known ideas in the Vinerian analysis of preferential agreements.

The first is, in the classical view, a positive thing: the lower barriers open further the market for the (efficient) imported good. The second, still in the classical view, is “less positive”: the product from the partner in the agreement, though not *the most efficient one*, in world terms, becomes cheaper than the alternatives and, due to this, increases its market share.

In our case, *trade creation* is obtained by the direct final-price-of-imports effect, supposing an infinite elasticity of supply and that the only change in imports is due to those from the partner. *Trade diversion* is computed assuming that total imports remain constant, the preference, thanks to a substitution effect, then causing some deviation in imports from outside the partner in favour of it. An import price elasticity is needed to compute the former, and a substitution elasticity for the latter. At the six-digit level, the two effects may co-exist and this explains why both enter in the market gains. Though not exactly reflecting the corresponding classical concepts, a very large trade deviation relative to the creation may signal – if the elasticities used are correct – that a true deviation will take place.

In order to check the robustness of our conclusions, we worked with two base periods for the trade flows, 1997-1998 (the “golden years”) and 2000-2001 (the “crises years”)¹. Simple averages of imports for the two periods were the basis for the simulations. As regards product selection, there wasn’t much difference between the two. We shall mainly discuss results for the 2000-2001 period, the corresponding calculations being thus allowed to be taken as conservative.

Two scenarios were considered: i) a reduction of 50 per cent in the ad-valorem tariff equivalent; ii) a reduction of 100 per cent in the ad-valorem tariff equivalent. Using these extreme, uniform concessions, gives a full grasp of what the Agreement may bring forth, avoiding particular computations subject to the vagaries of the successive offers.

Three different levels were used for the needed elasticities. A central value taken from the “Tariff & Trade” Data Base, OECD (2003); and an upper and a

¹ For the reasons why “golden” and “crises” years, see section 3.

lower bound equal, respectively, to the central value multiplied and divided by 1.5.

The tariff equivalents were extracted with the help of the UNCTAD/TRAINS database, several other sources, notably the previously mentioned OECD (2003), having been of extreme usefulness.

The final dollar figures must not be taken at their precise, face value; their main utility is in providing a ranking of the opportunities, pointing out the main products to benefit from the agreement. Even so, they may be used as a first guess on the actual revenues, if the reader keeps in mind the limitations of the study.

The first limitation is that the whole work is, in technical terms, a partial equilibrium evaluation. This means that, while analysing one product, all other markets “are frozen”, the computation of the effects completely disregarding any interaction the given product might have with the other segments of the economy. In practice, preferential agreements trigger multiple interactions, with different timings, and the partial equilibrium assumption is a (more *or* less) crude approximation of the reality, Baldwin and Venables (1995), Flôres (1996). However, the methodological alternative, computable general equilibrium models, provides results at a rather aggregate level, and wouldn't be compatible with the purpose of this study.

There is no clear indication whether consideration of all relevant interactions would produce higher or lower values than those under partial equilibrium. A rough guess can be made from an informal evaluation of the linkages the specific product bears in the bloc under examination. If it is tied to “winning or neutral” products, actual gains may be even higher. In the opposite case, gains may be inferior. In the absence of a minimally reliable informal evaluation of this kind, the values here presented should be taken as an (hopefully unbiased) average of positive and negative interactions.

The fact that each gain results from a partial equilibrium calculation doesn't authorise to add up the individual product values. We do however say a

few words on both aggregate totals; numbers which consist in a rough, second best estimate of a total trade in goods gain.

Another limitation is parameter values. Elasticities are needed for computing the trade creation and diversion effects. As said, results were obtained for three possible elasticity values: a lower, a central and an upper figure. This also allowed us to check the sensibility of our findings ².

Computation of tariff equivalents is always debatable; our experience being that the final numbers usually underestimate the ultimate (tariff) effect of all barriers. Many key products for the powerful Mercosul agribusiness face either TRQ's ³ – making the equivalent a function of the particular year used – or prohibitive escalating tariffs which, by highly restraining trade, place one at the borderline of validity of the methodology adopted. In this regard, it wouldn't perhaps be unfair to say that our dollar totals are lower bounds to the revenues due to liberalisation.

The third limitation is a warning that must be made. As explained, products are identified with the help of indexes computed on the *actual* trade flows. It might be that, for a specific sector, sure to gain with the agreement, no results appear. Though we think that our final lists are pretty close, in product content, to the key “winners”, this is possible. The reason would be that, for some motive, the product, though competitive, has its flow (to the partner and maybe to the world) strongly constrained. One of the most frequent motives for this is, again, the existence of extremely high barriers – as happens in the EU side –, making the actual flows negligible. In such case, the complementarity and comparative advantage indexes will produce values not high enough for the product to be selected.

2. Detailed Results.

Table 1 summarises the total number of selected products for each bloc.

² See Table 10, in section 3.

³ Tariff-rate Quotas are a device created by the EU to comply – at a minimal change – with requirements of the Agreement on Agriculture of the Uruguay Round (see, for instance, Abbott (2002)).

Insert Table 1 by here

Market access simulations were performed for a subset of the products exhibiting trade opportunities. In the case of the EU, out of the 842 selected in 2000-2001, a total of 100 products with potential trade expansion were used, representing a share of 18,42 per cent of total EU exports to Mercosul. These 100 products were chosen as the most representative ones in terms of opportunities, based on their generated total trade effects (trade creation and trade diversion). All the 72 opportunities identified for Mercosul were examined.

2.1. The EU gains.

Table 2 details, at the two-digits level of the HS, the opportunities for the EU, considering the 2000-2001 period. Their number is quite high and, if 239 out of the 842 products are in sector 84 (nuclear reactors, boilers, machinery, etc), significant frequencies are found in sectors 85 (electrical, electronic equipment), 90 (optical, photo, technical, medical, etc, apparatus), 48 (paper and paperboard, articles of pulp, paper and board), 29 (organic chemicals), 73 (articles of iron or steel), 32 (tanning, dyeing extracts, tannins, derivs., pigments, etc), 39 (plastics and articles thereof) and 82 (tools, implements, cutlery, etc, of base metal). Actually, in sixty-four out of the ninety-six sectors in the HS, at least one product was selected. In the case of the golden years period, though more opportunities were identified, 1 086, their frequency distribution along the sectors is quite close to the previous one.

Insert Table 2 by here

The core of our results is a set of lists, ranked by total market access gains (under full liberalisation of trade barriers), of all the indexes and computations corresponding to the top 100 selected products. We shall discuss the values obtained as the arithmetic average of the results with the three different elasticities used ⁴.

Market access gains for this subset, now distributed along 24 two-digits sectors, decrease very slowly in all cases. The top product (medicaments n.e.s., in dosage) presents, in 2000-2001 values, a 93,0 mi US\$ gain; the one in the hundredth position (mountings, fittings & similar articles of base metal for furnitures) still displays a total gain of 4,8 mi US\$, a value slightly superior to 1/20 of the top one. As a percentage of each product exports, the gains range from 13 to 62 per cent; even the lowest bound is not a negligible figure. All this calls attention to the variety of significant market penetration possibilities that the Agreement may open to European exporters.

The added gains – under total liberalisation – amount to 1,20 bn US\$. Keeping in mind the remarks on the meaning of this sum, it turns out to be around 6 per cent of current annual EU exports to Mercosul; something attractive and not usually obtained in a standard preferential agreement⁵. Moving to a fifty per cent reduction in the barriers, still produces a figure of 0,61 bn US\$.

For all opportunities, the trade deviation figure is *never* higher than the trade creation one. This is good news for both sides. For EU businesses, it confirms their competitiveness in the international arena; for Mercosul, it signals that the Agreement won't imply a great distortion in its import flows. Moreover, for quite many products, the deviation is much lower than the creation – for eight of them, it is even around or smaller than 15 per cent of the

⁴ All the lists/figures produced (the average values, those related to the lower and upper bounds for the elasticities, as well as those under a 50 per cent reduction in the trade barriers and the whole corresponding set for the 1997-1998 base period) are available from the authors.

⁵ It is maybe worth reminding that general equilibrium evaluations, even under imperfect competition, produce gains of at most 2 per cent in this case.

creation⁶. This means that, for many Mercosul markets, very likely the Agreement *does create trade*, in the best classical sense of the concept.

As mentioned above, two-digit sectors where more products were identified aren't necessarily those where the highest gains are found. Table 3, another partial synthesis of the top 100 results, shows the five two-digit sectors where the highest (aggregate) gains occur.

Insert Table 3 by here

At the aggregation level of the table, concentration is more evident. The five sectors comprise 69 out of the 100 products, accounting for nearly 75 per cent of the total gains. It is also worth noticing that the gains in the “machinery and electrical & electronic equipment sectors” (84 and 85) amount to more than half of the total gains.

Table 4 provides a consistency check to the previous findings. Most products in it – precisely 17 out of the 25 top EU exports - are already fully (or close to) exploiting their possibilities. However, for 8 products, combination of the tariff values with the European competitiveness still opens further opportunities for them. Of these, 6 belong to sectors in Table 3 (three to 84, two to 85 and one to 30), the “newcomers” being whiskies and perfume & toilet waters. For these two, estimated gains are of 17,1 and 17,3 mi US\$, respectively, both higher than 15 per cent of the present flows.

Insert Table 4 by here

2.2. The Mercosul gains.

⁶ An emblematic, and very easy to understand example of these eight goods is *whiskies*, for

Table 5 shows, at the two-digits level of the HS, the frequency of opportunities selected for Mercosur, considering the 2000-2001 period. The number of sectors is much inferior than the one in Table 2; only 28, comprising 72 products. The highest frequencies are in sectors 02 (meat and edible meat offal), 03 (fish, crustaceans, molluscs, aquatic invertebrates n.e.s.) and 20 (vegetable, fruit, nut, etc food preparations). Again, there isn't much difference from the 1997-1998 pattern, though the latter is a little more positive. The predominance of the food and agriculture sectors is remarkable, followed by traditional manufactures, notably textiles. In the more modern sectors, 7 products were identified, 5 being in chemical-related ones – 28 (inorganic chemicals, precious metal compounds, isotopes), 29 (organic chemicals) and 35 (albuminoids, modified starches, glues, enzymes) – and two in the electrical, electronic equipment sector 85.

As in the corresponding EU case, we shall mainly discuss the results concerning the 72 opportunities identified for 2000-2001, under total liberalisation, and obtained as the arithmetic average of those obtained with the three different elasticity values ⁷.

Given the more limited scope of Mercosul flows, for the last 11 of the 72 products, the gain was negligible (smaller than 1000 US\$). It is worth noticing that, for only 17 of the 61 products with non-zero gains, trade creation is higher than trade deviation, signalling that, as regards the Mercosul penetration, it is likely to be more trade distorting than the EU one.

Insert Table 5 by here

The distribution of the gains for the winning products is quite concentrated, the first three top goods – orange juice, bovine cuts boneless, fresh or chilled *and* frozen - accounting for a little more than 50 per cent of the

which trade creation amounts to 16,7 mi US\$, and the deviation is 0,4 mi US\$.

⁷ All results - as in footnote 4 - can be obtained from the authors.

total. If market access gains are extremely high for these products – 275,9 ; 234,8 and 219,6 mi US\$ -, they are lower than 100 000 US\$ from the fifty-fifth product onwards. At this position, in the similar EU ranking, the corresponding value is 7,4 mi US\$. On the other hand, the sum of all gains under total liberalisation amounts to 1,45 bn US\$, a figure more than 10 per cent higher than the one obtained for the top 100 EU opportunities. Actually, it represents around 8 per cent of current annual exports; again something extremely attractive for a standard preferential agreement. A fifty per cent reduction in the barriers produces a figure of 0,74 bn US\$.

In the Mercosul case, two-digit sectors where more products were identified correspond somewhat better to those where the highest gains are found. Table 6 shows the aggregate gain for the five top two-digit sectors related to the 72 products. For the first two sectors, significant trade creation takes place, confirming the well-known Mercosur competitiveness in these areas. However, for the other three, evidence of distortions is present, the only exception being anchovies (030563).

Insert Table 6 by here

If one adds to the five sectors in Table 6 the next two ones – comprising then, 37 out of the 72 products identified -, the total gain related to these seven sectors is 1,38 mi US\$, i.e., 95,2 per cent of the figure for the 72 products. No wonder, the focus for Mercosur negotiators is quite clear and restricted.

Though modest, a global gain of 7,6 mi US\$ in the four more advanced sectors previously mentioned (28, 29, 35 and 85) raises hopes for their development.

Table 7 provides additional consistency to the findings above. In a way similar to the EU case (Table 4), 18 products seem to be already exploiting their market possibilities, only 7 identified products appearing in the top 25.

However, in a dramatic demonstration of how key Mercosul interests are concentrated in few markets, already penetrated by its goods, *the seven identified products are exactly the seven top ones in the total gains ranking.*

Insert Table 7 by here

3. Results: A More General View.

Trade between the EU and Mercosul is more important for the latter, the former accounting for around $\frac{1}{4}$ of either Mercosul imports or exports. Until 1994, the balance of trade was favourable to the Southern Cone, but since 1995 the situation has been reversed. Indeed, exports to the EU, after having reached a peak in 1997-98, present a declining trend, while imports have been less sensitive to the crises Mercosul experienced around 2000. Table 8 shows the trade flows for the last half of the nineties, adding numerical support to these considerations. The preferential agreement stands as an important way to bring exchanges back to at least 1998 levels, boosting the flows from these values up.

Insert Table 8 by here

A closer look at the structure of the trade flows reveals that Mercosul exports are, much more than the EU ones, concentrated in a well-defined group of products. Taking the 2000-2001 period, at the six-digit level, the 25 most important Mercosul exports to the EU accounted for a little more than 60 per cent of total exports to the region, while the same procedure from the EU side

produces 25 goods accounting for less than 27 per cent of total EU exports to Mercosul⁸.

Mercosul barriers to EU goods give way to a higher (simple) average equivalent tariff, with practically no peaks, but the opposite is true for the EU barriers, where a significant number of peaks (high to very high tariff equivalents) is present in a set for which the average tariff is reasonably low⁹.

The two points above are fundamental in explaining, in a global way, our results. Mercosul gains should, consequently, be much more concentrated, with their larger values associated to a few products which face the present peaks. Most of these are, as expected, in the agricultural commodities and food sectors. EU gains resulted more evenly spread, comprising a large portfolio of diversified exports.

Table 9 and Figure 1 add further evidence to the above, confirming remarks already made in section 3. The table shows the quartiles of the two distributions of gains. Taking the third quartile (Q3), which is roughly the same in both cases, the drastic fall *below* it and the steep rise *after* it, for Mercosul, contrast with the much smoother European progression. The same statistics for the sub-samples related to the upper quarter of gains complements the view on Mercosul's concentration.

Insert Table 9 by here

Figure 1 displays scatter diagrams of the trade diversion versus trade creation values for both cases. While for the EU (Figure 1.b.) all points are above the 45 degrees line, the opposite is most of the times true for Mercosul.

⁸ See also Tables 5 and 7 in section 2.

⁹ Simple averages of *ad valorem* tariffs, over the HS eight-digit level, give, for Mercosul, the value of 10,8 , while, for the EU, 4,9.

Insert Figure 1 by here

Finally, Table 10 gives an idea of the sensitivity of results. Elasticities do matter, the intervals being quite large. In a rough approximation, their sizes are around the order of magnitude of the lower bound; as the values discussed in the text are close to the midpoints, this means that actual gains can be either 1/3 lower or higher.

Insert Table 10 by here

According to the last offers presented by both sides, concessions have a timing and, of course, encompass – though perhaps not as much as the EU desired – liberalisation or transparency measures in services and government procurement, as well as stronger enforcement of selected intellectual property rights issues. From the evidences produced in this paper, a crude estimate of a lower bound for all the (long run) gains each community could then reap would be around 1,5 bn US\$ - something more *or* less, depending on the global dynamics of the liberalisation.

4. Conclusions.

The European Union has continually stressed the theme of *social cohesion* in its relations with Latin America. Mercosul, for obvious reasons, is entirely in favour of this approach as a threading line for all its exchanges with the EU. Notwithstanding, economic forces are the engine that sets integration in motion and, eventually, makes societies come closer and share, in a consistent and lasting way, a common core of values, founded on similar *living standards*. The

very European experience, since the Treaty of Rome till the May 1; 2004 Enlargement, is a telling illustration of this argument.

The economic motor is the combination of thousands, if not millions of interactions, that progressively create the ties and set the bounds related to different activities, ever designing a mesh of exchanges that unavoidably links the economies involved.

In this vein, the EU-Mercosul Agreement, beyond a source of profits for both partners, can be a *concrete* way of strengthening the EU-Mercosul partnership. Great imbalances, in terms of the global gains it will open for the case of trade in goods don't seem to exist.

Signing of the Agreement will open a wide spectrum of opportunities for the EU businesses. Many of these will ease the path for deeper services trade. In the Mercosul side, its internationally competitive exporters will gain a substantial and well-deserved market access in sectors where, though constrained nowadays, they already are reasonably positioned.

For Mercosul, it is evident why its negotiators stick so toughly to concessions in agriculture: most of its gains will come from there. But the Agreement can also act as a first serious trial for future liberalisations with other internationally competitive partners. It raises a warning on needed competitiveness improvements in the industrial sectors, in a forthcoming freer multilateral trading environment.

Annex: Methodological Aspects.

A.1. The Trade Complementarity and Related Indexes.

At the product level, opportunities are identified with the help of the following indexes.

The *Trade Complementarity Index (TCI)* for product/good k , exported from country/bloc i to country bloc j , is defined as,

$$TCI_{ij}^k = \frac{X_i^k / X_i}{M_w^k / M_w} \cdot \frac{M_j^k / M_j}{M_w^k / M_w}, \quad (1)$$

where,

X_i^k = country i 's exports of good k ,

X_i = total exports of country i ,

M_j^k = country j 's imports of good k ,

M_j = total imports from country j ,

M_w^k = world imports of good k ,

M_w = total world imports.

The TCI measures the level of complementarity between the export supply and the import demand structures of the two countries or regions; the greater this similarity, the more likely trade between them is. Values greater (less) than 1 imply a strong (weak) complementarity between the export specialisation of a country and the import specialisation of its partner.

The TCI can be decomposed as the product of two well-known indexes: the *Revealed Comparative Advantage or Export Specialisation Index (RCA)* of the exporting country i and the *Revealed Comparative Disadvantage or Import Specialisation Index (RCD)* of the importing country j , which, from (1), can be expressed as:

$$RCA_i^k = \frac{X_i^k / X_i}{M_w^k / M_w}, \quad (2)$$

$$RCD_j^k = \frac{M_j^k / M_j}{M_w^k / M_w}. \quad (3)$$

The RCA equals the ratio between the share of a product in a country's total exports and that of the same product in world trade; it roughly shows the export specialisation of a country. When the RCA is greater than 1, the country is more

export oriented in that particular good than the “world average” and, therefore, it displays a *revealed* comparative advantage in that particular good.

Analogously, the RCD equals the ratio between the share of the product in a country’s total imports and the corresponding share in world trade. When the import specialisation index is greater than 1, the country *reveals* a comparative disadvantage in that good.

Letting A stand for either Mercosul or the EU, and B for the other bloc, once A is chosen, the three requirements for identifying opportunities for bloc A, stated in section 2, can be rephrased as:

- i) their TCI (as exports from A to B) is higher than 1;
- ii) their RCA (as exports from A) is higher than 1;
- iii) the tariff equivalent they face in B is equal or superior to 10 per cent.

A2. The Simulation Model

Once the products are identified, a ranking of trade opportunities is produced. In order to achieve this, we estimate the trade effects resulting from a reduction in the tariff and non-tariff barriers – the *ad valorem tariff equivalent* – present in both sides. The simulations are based in a model originally developed by Cline et. al. (1978) and used, among others, by Laird and Yeats (1990) and Vaillant and Ons (2002), to analyse the effects of either changes in trade preferences or unilateral trade liberalisations.

The model assumes that the import demand function of country j for a good (k) produced in country i may be expressed as¹⁰:

$$M_{ji} = F(Y_j, P_{ji}, P_{ij}) \quad , \quad (4)$$

where P_{ji} is the price of the good in the importing country j , or the final domestic price of the good, P_{ij} is the price of the good in the exporting country i (or the export/world price of the good), and Y_j is the national income in country j .

Country i ’s export supply function to country j may be written as:

$$X_{ij} = F(P_{ij}) \quad , \quad (5)$$

equations (4) and (5) being related by the market clearing condition,

$$M_{ji} = X_{ij} \quad (6)$$

The domestic price of the good in the importing market j can be expressed as the product of the export price by the *ad valorem* equivalent tariff t_{ji} :

$$P_{ji} = P_{ij} (1 + t_{ji}) \quad (7)$$

The Trade-Creation Effect

is the increased demand in country j for the good exported by country i , resulting from the price decrease associated to the reduction or elimination (in country j) of the tariff equivalent t_{ji} , all imports from other destinations being frozen.

Using discrete rates of change (represented by Δ) for the variables, from equation (7) we can write:

$$\Delta P_{ji} = P_{ij}^0 \Delta t_{ji} + (1 + t_{ji}^1) \Delta P_{ij} \quad (8)$$

where t_{ji}^1 is the tariff applied *after* trade liberalisation, the superscripts accounting for the periods before (0) and after liberalisation (1).

The formula for the elasticity of import demand with respect to the domestic price, E_m , can be rearranged as follows:

$$\frac{\Delta M_{ji}}{M_{ji}^0} = E_m \frac{\Delta P_{ji}}{P_{ji}^0} \quad (9)$$

Obtaining, from (7) and (8), an expression for $\frac{\Delta P_{ji}}{P_{ji}^0}$, and substituting it in (9), gives,

$$\frac{\Delta M_{ji}}{M_{ji}^0} = E_m \left(\frac{\Delta t_{ji}}{(1 + t_{ji}^0)} + \frac{(1 + t_{ji}^1) \Delta P_{ij}}{(1 + t_{ji}^0) P_{ij}^0} \right) \quad (10)$$

From the expression for the elasticity of export supply, it follows that:

$$\frac{\Delta P_{ij}}{P_{ij}^0} = \frac{1}{E_x} \frac{\Delta X_{ij}}{X_{ij}^0} \quad (11)$$

Replacing this in (10) and remembering the equality $\frac{\Delta M_{ji}}{M_{ji}^0} = \frac{\Delta X_{ij}}{X_{ij}^0}$, the

increase in imports becomes:

¹⁰ As a Partial Equilibrium model, it calculates the trade liberalisation effects on a single market. To simplify the notation we do not include subscript k for the good, but the reader should bear in mind that all equations are related to the same, single good.

$$\Delta M_{ji} = M_{ji}^0 E_m \frac{\Delta t_{ji} / (1+t_{ji}^0)}{\left(1 - \frac{E_m (1+t_{ji}^1)}{E_x (1+t_{ji}^0)}\right)} \quad (12)$$

Assuming that the elasticity of export supply with respect to the world price is infinite, the *value* of trade creation can finally be expressed as:

$$\boxed{TC_{ji} = \Delta M_{ji} P_{ji}^0 = V_{ji}^0 E_m \frac{\Delta t_{ji}}{(1+t_{ji}^0)}} \quad (13)$$

where V_{ij}^0 is the *value* of imports, and the only parameter needed to compute (13) is the import demand elasticity E_m .

The Trade Diversion Effect

refers to the tendency of importers to *substitute* trade flows from one source for another, in response to a change in the import price of supplies from the latter.

Different options have been used to estimate trade diversion effects (see, for instance, Baldwin and Murray (1977)); our method follows the proposal by Cline et. al. (1978), which supposes that explicit values for the elasticities of substitution between goods from different sources are available.

To generalise the trade diversion results, we assume that the importing country offers preferential treatment to a group of countries (subscript B) and as a result of this policy, imports from non-preference-receiving countries (subscript NB) are being affected.

It is possible to define the elasticity of substitution between imports from B and NB in the following manner:

$$E_S = \frac{\frac{\Delta(M_{jB} / M_{jNB})}{(M_{jB}^0 / M_{jNB}^0)}}{\frac{\Delta(P_{jB} / P_{jNB})}{(P_{jB}^0 / P_{jNB}^0)}} \quad (14)$$

where M_{jB} (M_{jNB}) are defined as imports from the preference-receiving countries (non-preference-receiving countries) by country j , and P_{jB} (P_{jNB}) is the price in

country j of the good imported from the countries belonging to the preferential agreement (non-preference receiving countries).

We define the share of bloc-countries (no bloc-countries) in total imports of country j by ϕ_{jB} (ϕ_{jNB}):

$$\phi_{jB} = \frac{M_{jB}}{M_{jW}} \quad , \quad \phi_{jNB} = \frac{M_{jNB}}{M_{jW}} \quad (15)$$

so that $\phi_{jNB} + \phi_{jB} = 1$.

The trade diversion effect can be written in the following way,

$$\Delta TD_{jB} = (\phi_{jB}^1 - \phi_{jB}^0) M_{jW} \quad . \quad (16)$$

As total imports remain constant, i.e., $M_{jW}^0 = M_{jW}^1 = M_{jW}$, after some tedious algebra, it is possible to obtain the following expression,

$$\Delta TD_{jB} = \phi_{jB}^0 \frac{\phi_{jNB}^0 Es \frac{\Delta(P_{jB}/P_{jNB})}{(P_{jB}^0/P_{jNB}^0)}}{1 + \phi_{jB}^0 Es \frac{\Delta(P_{jB}/P_{jNB})}{(P_{jB}^0/P_{jNB}^0)}} M_{jW}^0 \quad . \quad (17)$$

Replacing the shares as defined in (15), we obtain,

$$\Delta TD_{jB} P_{jB}^0 = \frac{(M_{jB}^0 P_{jB}^0) Es \frac{\Delta(P_{jB}/P_{jNB})}{(P_{jB}^0/P_{jNB}^0)}}{1 + \frac{M_{jB}^0}{M_{jNB}^0} (1 + Es \frac{\Delta(P_{jB}/P_{jNB})}{(P_{jB}^0/P_{jNB}^0)})} \quad . \quad (18)$$

An estimate of the ratio between the two volumes of imports is then needed. Moreover, the relative price (finite) difference appearing in (18) – known as the price effect – is also needed. We then assume that the export supply elasticity of the non-preference receiving countries is infinite; this means that the world price of the products exported by the extra-bloc countries is kept fixed. Given that the tariff levied on these extra-bloc countries by country j remains fixed, the domestic price of extra-bloc imports remains equally fixed. As a result, the proportional change in the

domestic relative price $B-NB$ is equal to the proportional change in the domestic price P_{jB} .

Taking the above into account, using the definitions for the import demand and export supply elasticities, the market clearing condition, and a little algebra, it follows that the price effect is,

$$\frac{\Delta P_{jB}}{P_{jB}^0} = \frac{\Delta t_{jB}}{(1 + t_{jB}^0)} \quad (19)$$

By way of (19), and supposing that $P_{jB}^0 = P_{jNB}^0$, (18) finally becomes:

$$\Delta TD_{jB} P_{jB}^0 = \frac{V_{jB}^0 E_S \frac{\Delta t_{jB}}{(1 + t_{jB}^0)}}{1 + \frac{V_{jB}^0}{V_{jNB}^0} (1 + E_S \frac{\Delta t_{jB}}{(1 + t_{jB}^0)})} \quad (20)$$

where the V 's stand for the volume of imports (in money values) and, as in (13), the only needed parameter is an elasticity, now the substitution elasticity E_S .

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Table 1: Products selected in each bloc.

Period	No. of opportunities	% of Total Exports
a) For the European Union (in the Mercosul market).		
1997/1998	1086	37,1
2000/2001	842	34,5
b) For Mercosul (in the EU) market.		
1997/1998	81	15,8
2000/2001 ¹	72	15,2

¹ For the products belonging to the subheadings 020130 to 020230, and 160250 to 160300 (products ancillary to the bovine meat sector), the average has been computed over 1999/2000, to avoid the period when the foot-and-mouth disease was detected in Mercosul.

Table 2 : EU - MERCOSUL Agreement; Frequency of Opportunities for the EU, by (two-digits) sectors of the Harmonised System. Period 2000-2001.

HS, Rv. 2	Description of the Sector	Number of Opportunities
03	Fish, crustaceans, molluscs, aquatic invertebrates nes	2
04	Dairy products, eggs, honey, edible animal product nes	3
08	Edible fruit, nuts, peel of citrus fruit, melons	1
09	Coffee, tea, mate and spices	2
11	Milling products, malt, starches, inulin, wheat gluten	4
15	Animal,vegetable fats and oils, cleavage products, etc	5
17	Sugars and sugar confectionery	2
18	Cocoa and cocoa preparations	1
19	Cereal, flour, starch, milk preparations and products	2
20	Vegetable, fruit, nut, etc food preparations	6
21	Miscellaneous edible preparations	4
22	Beverages, spirits and vinegar	5
24	Tobacco and manufactured tobacco substitutes	2
28	Inorganic chemicals, precious metal compound, isotopes	12
29	Organic chemicals	24
30	Pharmaceutical products	10
32	Tanning, dyeing extracts, tannins, derivs,pigments etc	21
33	Essential oils, perfumes, cosmetics, toileteries	15
34	Soaps, lubricants, waxes, candles, modelling pastes	14
35	Albuminoids, modified starches, glues, enzymes	8
37	Photographic or cinematographic goods	5
38	Miscellaneous chemical products	17
39	Plastics and articles thereof	19
40	Rubber and articles thereof	14
41	Raw hides and skins (other than furskins) and leather	5
42	Articles of leather, animal gut, harness, travel goods	4
44	Wood and articles of wood, wood charcoal	1
45	Cork and articles of cork	3

48	Paper & paperboard, articles of pulp, paper and board	26
49	Printed books, newspapers, pictures etc	1
51	Wool, animal hair, horsehair yarn and fabric thereof	1
52	Cotton	14
54	Manmade filaments	11
55	Manmade staple fibres	12
56	Wadding, felt, nonwovens, yarns, twine, cordage, etc	7
57	Carpets and other textile floor coverings	2
58	Special woven or tufted fabric, lace, tapestry etc	7
59	Impregnated, coated or laminated textile fabric	12
60	Knitted or crocheted fabric	1
61	Articles of apparel, accessories, knit or crochet	8
62	Articles of apparel, accessories, not knit or crochet	10
63	Other made textile articles, sets, worn clothing etc	5
64	Footwear, gaiters and the like, parts thereof	2
68	Stone, plaster, cement, asbestos, mica, etc articles	3
69	Ceramic products	5
70	Glass and glassware	12
71	Pearls, precious stones, metals, coins, etc	6
72	Iron and steel	11
73	Articles of iron or steel	23
74	Copper and articles thereof	5
75	Nickel and articles thereof	5
76	Aluminium and articles thereof	2
82	Tools, implements, cutlery, etc of base metal	19
83	Miscellaneous articles of base metal	9
84	Nuclear reactors, boilers, machinery, etc	239
85	Electrical, electronic equipment	69
86	Railway, tramway locomotives, rolling stock, equipment	9
87	Vehicles other than railway, tramway	12
89	Ships, boats and other floating structures	8
90	Optical, photo, technical, medical, etc apparatus	47
91	Clocks and watches and parts thereof	3
92	Musical instruments, parts and accessories	5

93	Arms and ammunition, parts and accessories thereof	7
94	Furniture, lighting, signs, prefabricated buildings	4
96	Miscellaneous manufactured articles	9
TOTAL		842

Table 3: EU gains* (in million, 2000-2001, US\$) in the top two-digits sectors related to the 100 most important products, under total trade liberalisation.

Top 5 Sectors	Gains (number of products)
84. Nuc. Reactors, boilers, machinery, etc	412,0 (31)
85. Electrical and electronic equipment	206,2 (15)
30. Pharmaceutical products.	114,9 (9)
90. Optic., photo, tech. & med. apparatus	87,0 (8)
48. Paper & paperboard and rel. articles	77,2 (6)
TOTALS	897,3 (69)

* Arithmetic average of the results obtained with the three elasticity values.

Table 4: Selected Characteristics and Opportunities Among the 25 Top EU Exports to Mercosul. Period 2000-2001; Exports in 1000 US\$.

Product	Description	Exports	Tariff	Chosen ?
870899	Motor vehicle parts nes	1 029 615	9,00	NO
880240	Aircraft nes of an unladen weight exceeding 15,000 kg	541 552	0,00	NO
300490	Medicaments nes, in dosage	420 736	10,58	YES
880330	Aircraft parts nes	405 239	0,00	NO
851790	Parts of electrical apparatus for line telephone or line telegraphy	334 271	6,33	NO
870323	Automob. w/ reciproc. piston engine displac. > 1500 cc to 3000 cc	301 105	20,00	NO
851740	Apparatus, for carrier-current line systems, nes	266 214	0,00	NO
852990	Parts suitable f use solely/princ w the app of headings 85.25 to 85.28	231 972	8,57	NO
870829	Parts and accessories of bodies nes for motor vehicles	227 351	13,67	NO
847989	Machines & mechanical appliances nes having individual functions	179 792	12,00	YES
300220	Vaccines, human use	130 053	2,22	NO
840999	Parts for diesel and semi-diesel engines	126 520	16,00	YES
852520	Transmission appar., for radioteleph. Incorporat. Reception apparatus	122 684	8,80	NO
490199	Books, brochures, leaflets and similar printed matter, nes	122 626	0,00	NO
310490	Mineral/chemical fertilizers,potassic,nes,in packages weighg > 10 kg	117 832	3,00	NO
840734	Engines, spark-ignition reciprocating displacing more than 1000 cc	114 020	18,00	NO
300210	Antisera and other blood fractions	113 633	3,10	NO
711319	Art. of jewelry & pt therof of/o prec. met. w/n platd/clad w prec t	113 254	18,00	NO
220830	Whiskies	112 515	17,33	YES
847990	Parts of machines & mechanical appl. nes havg individual functions	106 614	15,00	YES
853690	Electrical app for switchg/protec elec circuits,not exceed 1,000 V,nes	104 601	14,80	YES
844319	Offset printing machinery nes	99 244	7,00	NO
847330	Parts & access. of automatic data process. machines & units thereof	97 760	4,70	NO
330300	Perfumes and toilet waters	96 721	18,00	YES
853890	Parts for use with the appar. of headg no. 85.35,85.36 or 85.37,nes	92 481	10,00	YES
Total		5 608 398		

Table 5: EU - MERCOSUL Agreement; Frequency of Opportunities for Mercosur, by (two-digits) sectors of the Harmonised System. Period 2000-2001.

HS, Rev 2	Description of the Sector	Number of Opportunities
02	Meat and edible meat offal	6
03	Fish, crustaceans, molluscs, aquatic invertebrates nes	10
04	Dairy products, eggs, honey, edible animal product nes	1
07	Edible vegetables and certain roots and tubers	1
08	Edible fruit, nuts, peel of citrus fruit, melons	5
09	Coffee, tea, mate and spices	1
10	Cereals	3
11	Milling products, malt, starches, inulin, wheat gluten	2
16	Meat, fish and seafood food preparations nes	2
17	Sugars and sugar confectionery	2
18	Cocoa and cocoa preparations	2
19	Cereal, flour, starch, milk preparations and products	1
20	Vegetable, fruit, nut, etc food preparations	8
21	Miscellaneous edible preparations	1
22	Beverages, spirits and vinegar	1
24	Tobacco and manufactured tobacco substitutes	3
28	Inorganic chemicals, precious metal compound, isotopes	1
29	Organic chemicals	3
35	Albuminoids, modified starches, glues, enzymes	1
56	Wadding, felt, nonwovens, yarns, twine, cordage, etc	3
60	Knitted or crocheted fabric	1
61	Articles of apparel, accessories, knit or crochet	1
62	Articles of apparel, accessories, not knit or crochet	2
63	Other made textile articles, sets, worn clothing etc	4
64	Footwear, gaiters and the like, parts thereof	2
70	Glass and glassware	1
82	Tools, implements, cutlery, etc of base metal	2
85	Electrical, electronic equipment	2
TOTAL		72

Table 6: Mercosul gains* (in million, 2000-2001, US\$) in the top two-digits sectors related to the 72 products, under total trade liberalisation.

Top 5 Sectors	Gains (number of products)
02. Meat and edible meat offal.	480,1 (6)
20. Vegetable, fruit, nut, etc food prep.	414,0 (8)
03. Fish, crustac., molluscs, aq. Inverteb.	175,0 (10)
24. Tobacco and manuf. tobacco subst.	108,2 (3)
10. Cereals	78,3 (3)
TOTALS	1 255,6 (30)

* Arithmetic average of the results obtained with the three elasticity values.

Table 7: Selected Characteristics and Opportunities Among the 25 Top Mercosul Exports to the EU. Period 2000-2001; Exports in US\$.

Product	Description	Exports	Tariff	Chosen ?
230400	Soya-bean oil-cake&oth solid residues,whether or not ground or pellet	2 833 133	0,00	NO
120100	Soya beans	1 684 266	0,00	NO
090111	Coffee, not roasted, not decaffeinated	793 563	3,30	NO
260111	Iron ores&concentrates,oth than roasted iron pyrites,non-agglomerated	726 193	0,00	NO
880230	Aircraft nes of an unladen weight > 2,000 kg but not exceedg 15,000 kg	643 756	1,90	NO
200911	Orange juice,unfermentd¬ spiritd,whether/not sugard/sweet,frozen	624 503	41,78	YES
470329	Chemical wood pulp,soda/sulphate,non-coniferous,semi-bl/bleachd,nes	573 984	0,00	NO
760110	Aluminium unwrought, not alloyed	384 315	6,00	NO
020130	Bovine cuts boneless, fresh or chilled	375 074	91,00	YES
240120	Tobacco, unmanufactured, partly or wholly stemmed or stripped	355 631	14,70	YES
260112	Iron ores & concentrates,other than roasted iron pyrites,agglomerated	343 990	0,00	NO
030613	Shrimps and prawns, frozen, in shell or not, including boiled in shell	320 470	14,80	YES
020230	Bovine cuts boneless, frozen	313 686	193,03	YES
020741	Fowl cuts and offal, domestic, except livers, frozen	293 481	0,00	NO
410422	Bovine leather, otherwise pre-tanned, nes	277 329	3,35	NO
880240	Aircraft nes of an unladen weight exceeding 15,000 kg	246 817	1,80	NO
160250	Bovine meat and meat offal nes,excluding livers, prepared or preserved	212 240	26,17	YES
100590	Maize (corn) nes	211 099	115,00	YES
410431	Bovine and equine leather, full/split grains, nes	174 187	6,55	NO
870421	Diesel powered trucks with a GVW not exceeding five tonnes	147 177	13,80	NO
840991	Parts for spark-ignition type engines nes	145 610	3,60	NO
260300	Copper ores and concentrates	142 501	0,00	NO
720712	Semi-fin prod,iron/n-al steel,rect/sq cross sect,cntg by wgt<.25% carb	135 558	2,45	NO
840999	Parts for diesel and semi-diesel engines	132 392	3,60	NO
760120	Aluminium unwrought, alloyed	130 300	6,00	NO
Total		12 221 249		

Table 8: Mercosul trade flows (in billion US\$) with the EU, 1996-2000.

	1996	1997	1998	1999	2000
Exports	18,3	19,5	20,1	19,2	17,3
Imports	21,9	25,7	26,5	22,9	18,9
Total trade	40,2	45,2	46,6	42,1	36,2

Source: DATA INTAL, Inter-American Development Bank.

Table 9: Quartiles of the distribution of gains, EU and Mercosul.

Quartiles	Mercosul ¹	EU ²
a) For all computed gains.		
Min	0	4 809
Q1	233	6 042
Median	1 614	7 774
Q3	11 512	12 270
Max	275 877	92 975
b) For the higher quarter.		
Min	13 007	12 307
Q1	16 516	13 963
Median	23 055	21 596
Q3	101 812	25 267
Max	275 877	92 975

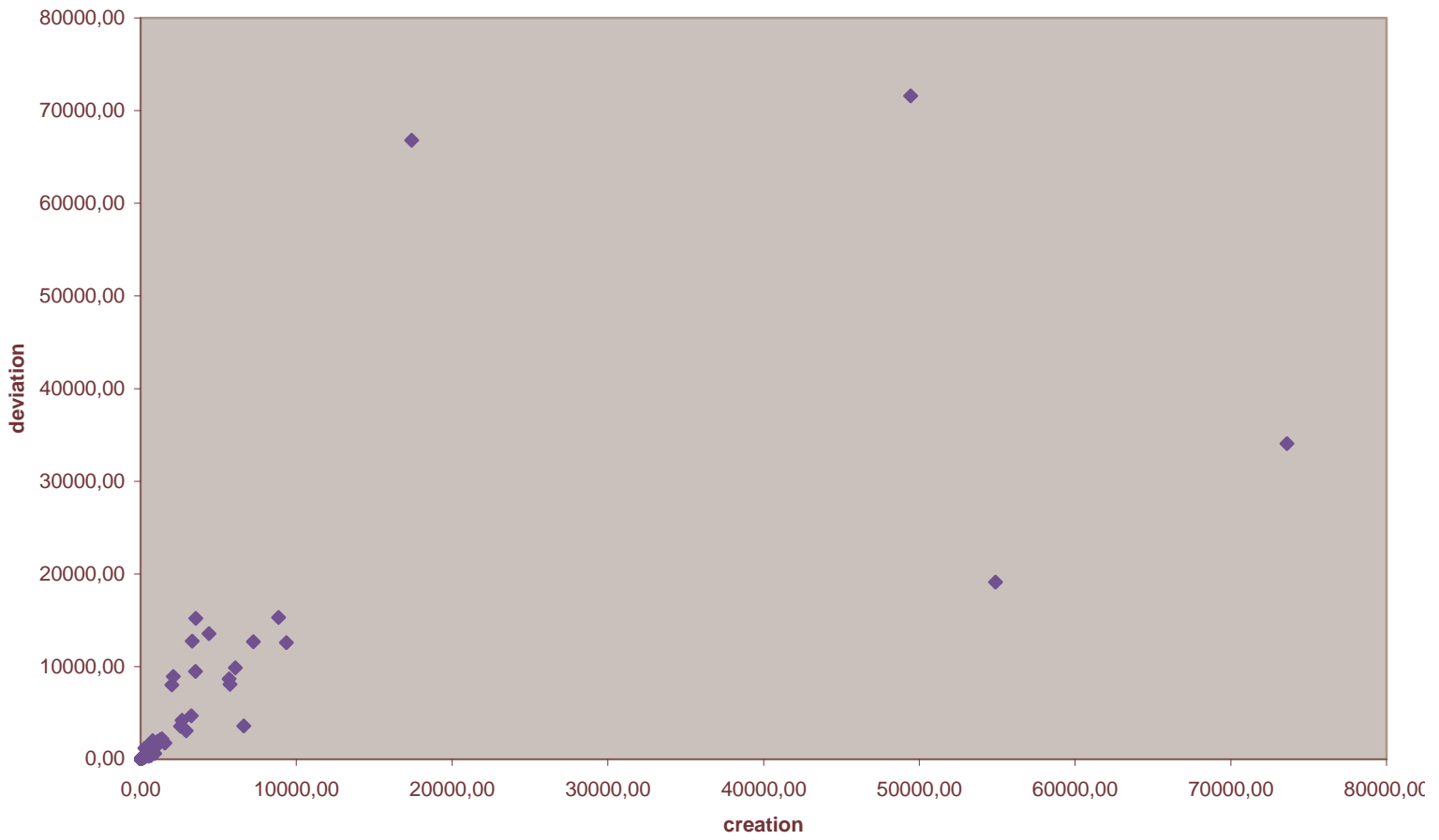
¹ 72 observations/products; ² 100 observations/products.

Table 10: Lower and upper bounds¹ for the five top gains, EU and Mercosul.

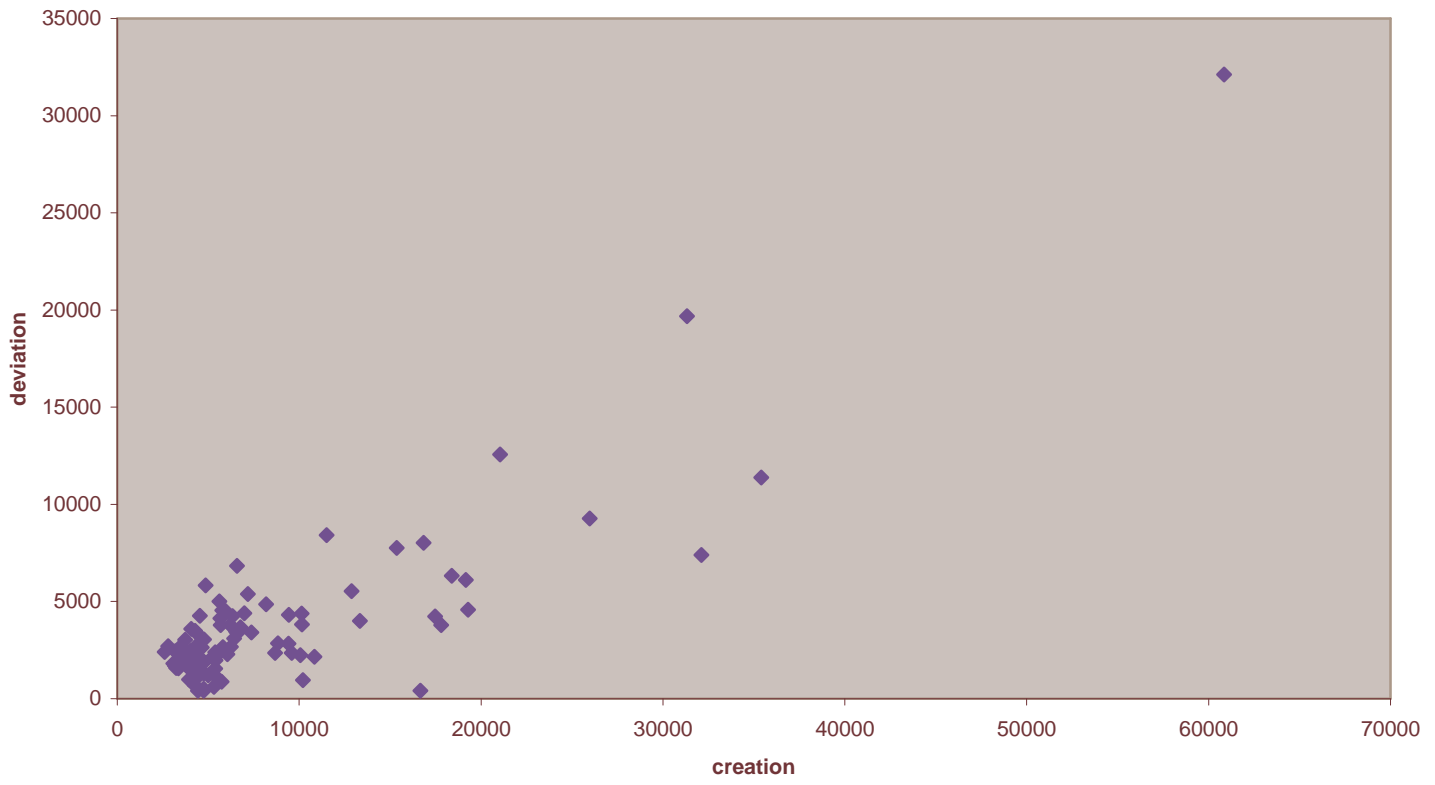
Order of the gains	Mercosul	EU
Top	178 198 ; 386 608	59 274 ; 131 304
2nd top	152 148 ; 328 447	32 718 ; 71 757
3rd top	140 811 ; 309 428	29 905 ; 65 980
4th top	77 371 ; 170 639	25 266 ; 55 726
5th top	71 457 ; 148 241	22 507 ; 49 704

¹ Computed using, resp., the lower and upper elasticity values.

Figure 1: Trade Creation x Trade Deviation
1.a: Mercosul.



1.b: EU



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