South-South RTAs and Industrial Location: is there asymmetric development?

Alessia Lo Turco*

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Abstract

*Department of Economics-Università Politecnica delle Marche-a.loturco@univpm.it.

1 Introduction

The target of this work is to analyze the impact of the formation of a South-South Regional Trade Agreement on the distribution of industrial activities across the countries involved in the agreement. The specific focus of the following pages is the Mercosur agreement, signed and enforced from 1991 onwards among Argentina, Brazil, Paraguay and Uruguay. The interest in the topic hinges on the very recent upsurge in the negotiation of South-South trade agreements and on the need to understand its consequences for the welfare and the development possibilities of the countries involved. As the phenomenon has widespread, economic theory has tried to shed some lights on its possible consequences.

The traditional trade theory Heckscher-Ohlin framework predicts that countries specialize according to their comparative advantage, the new trade theory sheds light on the relevance of increasing returns and market size in determining firms location decisions, finally, the New Economic Geography predicts that localization of production can even abstract from CA considerations and actually depend on the interplay of agglomeration and dispersion forces. Processes of cumulative causation can cause an uneven distribution of economic activity regardless initial differences in factor endowments. The reduction in transport costs can engender several localization patterns according to the mobility of factors, to the strength of agglomeration and dispersion forces. Generally speaking, NEG models predict a non-linear relation between falling trade costs and industrial localization: in autarky economic activity is dispersed across the different locations, for intermediate levels of trade costs the operating of agglomeration forces may induce economic activity to be localized in some locations only, while a further reduction in trade costs leads to the territorial dispersion of economic activity, since location becomes indifferent with zero trade costs.

The specific role played by South-South Preferential Trade Agreements (PTAs) is studied by Puga and Venables (1998): the model abstracts from comparative advantage as determinant of trade in order to focus on ag-

glomeration and dispersion forces as determinants of industrial development. Countries are supposed to be identical on the technology and factor endowments side, firms are only supposed to enter and exit the market according to short-run profitability affected by dispersion forces-1) factor market competition(the higher the share of industry in a country the higher the wages, the lower the profitability);2)product market competition (the higher the share of industry, the lower the output prices, the lower the profitability)- and agglomeration forces-1) forward linkages due to better and cheaper inputs in locations with more firms; 2) backward linkages due to the possibility of higher sales and more firms in countries with a higher industrialization. The interplay among these four forces can bear different implications for the different trade liberalization patterns.

Unilateral liberalization gives rise to cheaper imports and, by time, can favor industrialization in the Southern country. Multilateral liberalization turns to be superior because it allows for an improved market access in the Northern markets for all of the southern countries: the demand linkage goes together with the cost linkage and allows for rapid industrialization of countries in turn. South-South Preferential Trade agreements imply a reciprocal reduction in tariffs among southern countries with an unchanged tariff with respect to the rest of the world and with unchanged access to third countries: the demand link is quite important since it's the internal market and demand to foster industrialization.

The latter, though, occurs slowly and for one country in turn and benefits accruing from liberalization are lower than the one occurring under multilateral liberalization because no improved market access in Northern countries is at hand.

Once accounted for different sizes of the partners, the model might suggest a very slow path of diffusion of industrial activity from bigger partners to smaller ones. Then South-South integration would bring about a substantial agglomeration of activity followed, by time, by a slow process of diffusion.

Joining the notion of CA and trade diversion, Venables (2002) analyzes

the effect of the negotiation of a Customs Union (CU) on industrial development both in symmetrical and asymmetrical agreements. The idea is that the formation of a CU among countries with similar comparative advantage would cause the latter to be altered, benefiting the country with an intermediate comparative advantage with respect to the partners and the rest of the world and at the expense of partners with an extreme comparative advantage. Preferential tariffs therefore can affect production location enhancing the role of regional comparative advantage in determining production patterns: *ceteris paribus*, countries with a share of skilled labor higher than the partners (though lower than the rest of the world) would see, after the formation of the CU, their share of skilled labor intensive regional production increase with respect to the partners, at the same time, countries with a higher share of arable land would see their would become more and more specialized in primary productions.

Combining the suggestions from both models, whether building on agglomeration and dispersion forces or hinging on comparative advantages and trade diversion, the theoretical models seem to suggest that the formation of a South-South PTA would bring about the localization of higher skill intensive manufacturing activities in the largest and relatively more advanced partners leaving smaller and relatively more agricultural countries lagging behind with low skill intensive sectors. The main question suggested by the theory for the empirical work then concern whether the formation of a South-South RTA with the interplay between regional CA and agglomeration forces has actually hampered the possibility of industrial development for smaller and less advanced countries favoring their specialization in low skill intensive industries on behalf of larger and relatively more advanced partners.

Some empirical papers address the issue of economic integration, comparative advantage, geography and location of production: Midelfart-Knarvik et al.(2000) analyze the determinants of location of production across Europe using data on 33 industrial sectors in 14 EU countries between 1980 and 1997. Their dependent variable is the share of industry k production in

country i relative to the size of the industry k across Europe and country i's total production. Relative shares are predicted by the interaction of country and industry characteristics. They find that EU's cross country variation in industrial structure can be explained by comparative advantage combined with transport costs and geography. Factor endowments, in particular skilled labor, are important in attracting high skill intensive industries. Forward and backward linkages also matter. Finally, the fall in trade costs and government intervention makes economic forces become important in determining location.

In a following study, Midelfart-Knarvik and Overman (2002) investigate the role of European Structural Funds in reshaping the uneven distribution of economic activity among European countries. Apart from Ireland, European aids have attracted industries that are intensive in R&D in countries with low endowment of skilled labor. their main message is that the EU policy is successful only when directed more to strengthen than to contrast countries and regions' comparative advantages. furthermore EU SF have not succeeded in avoiding regional polarization within the Union and among the best performing regions the greatest number has improved its specialization.

Focusing on the MERCOSUR agreement, Sanguinetti et al.(2004) study the relocation of industry following the RTA formation in 1991. Using data on Argentina, Brazil and Uruguay over the period 1985-1998 they find that preferential trade liberalization has favored a reshaping of manufacturing production according to regional comparative advantage in labor and skilled labor. In addition, declining internal tariffs have weakened agglomeration forces determined by the distribution of market sizes. Their dependent variable is the country share production of industry k over the whole regional manufacturing product and the identification of the agreement effect comes via the introduction of the preferential margin and its interactions with country and industry specific characteristics in the regression. Preferential margins are measured for all of the MERCOSUR partners applying the schedule of preferences contained in the Asunciòn Treaty to the Brazilian MFN tariff

rate and substituting the MFN rate in the special regime sectors.

Table 1: Main Work on Economic Integration and Industrial Location

Authors	Topic	Methodology	Results
Midelfart-Knarvik et al.(2000)	Location within EU	Theoretical Model and Empirical test on 33 industries in 14 EU countries	Location of production determined by CA and Geography Skill abundant countries attract skill intensive industries and backward and forward linkages matter
Midelfart-Knarvik et al.(2002)	Location within EU & SF	Empirical test	SF successful when enhancing CA
Sanguinetti et al.(2004)	Location within MERCOSUR (Argentina, Brazil and Uruguay)	Empirical test	After the RTA formation weaker agglomeration forces and CA at work + dispersion of ec. activity preferential margins foster production in skilled intensive industries

The present work tries to unify, extend and improve the above empirical literature on RTAs formation and location of production and on MERCOSUR, focusing on the relation between the evolution of preferential market access, trade and production patterns in industrial sectors within the MERCOSUR agreement between 1985 and 2004.

The countries involved in the empirical analysis below are the four original members of the bloc, namely Argentina, Brazil, Paraguay and Uruguay. The present work represents a particular effort in data collection.

The specific piece of information on each member country preferential and Most Favored Nation tariff structure is from ALADI and goes from 1985 to 2004.

The data on production, capital and employment coming from the PADI database has been extended up to 2004 by means of information obtained from national statistical offices. Furthermore, the data on skilled labor and the number of establishments recollected form the same source have extended the available data set.

Finally the data on intra and extra-regional trade flows come from the COMTRADE data base.

In the end, all of the original information has been processed and harmonized in the ISIC rev. 2 classification. In Appendix A a broader description of the data and data sources is available.

In order to highlight the role of the South-South RTA in affecting location of production, the next section will provide evidence on the path of integration and trade patterns, subsequently another section will discuss the evolution of production concentration and specialization within the MERCOSUR bloc. Then an empirical model of the determinants of location patterns in MERCOSUR countries will be estimated. Finally, some conclusive remarks and policy implication will end the work.

2 The path of integration and trade

The first step to accomplish in order to study the relation between the policy change brought about by the negotiation of the agreement and the outcome of interest is to ascertain whether the policy change has occurred and in what measure.

The MERCOSUR RTA starts in 1991 with the Treaty of Asunciòn from which a trade policy convergence period began with the aim of the completion of the FTA and the start of the CU from 1995.

Table 2 resumes the evolution of intra and extra-zone tariffs from 1985 onwards, the table shows the weighted averages of the preferential and the Most Favored Nation (MFN) tariffs[1] were countries' sectoral exports to the world are used as weights. The intra-zone tariffs are lower and decline faster than the average extra-zone ones.

Intra-regional tariffs have actually been reduced dramatically after 1991.

Table 2: Evolution of tariffs by time

period	prf	mfn
1985-1990	32.99	32.99
1991-1994	6.88	15.71
1995-1999	1.57	11.96
2000-2004	0.26	11.99

Source: ALADI. Own computation.

In order to appreciate the evolution of preferential market access rev.2 ISIC sectors have been divided into 5 categories according to their technology content (Lall et al., 2005) and a complete list and description of the ISIC sectors and respective categories is displayed in table 13 in appendix B.

Table 3 shows the evolution from 1991 up to 2004 of preferential margins[2]. Resuming the information from the table, despite the preferential margins increase during the integration period, the least rapid and lowest erosion of

[1] Before 91 tariffs are supposed to be the same regardless of the trade partner.

[2] Calculated as $(mfn - pref)/mfn$

tariff rates occurs for resource based, medium and low tech manufacturing products

Table 3: Evolution of preferential margins

(mfn-prf)/mfn	Advanced	Low Tech	Medium Tech	Resource Based
1991-1994	0.65	0.68	0.70	0.70
1995-1998	0.98	0.95	0.94	0.92
1999-2004	0.99	0.99	0.99	0.98

Source: ALADI. Own computation.

More in detail, table 14 in appendix B shows that the the path of liberalization has been more rapid for those ISIC sectors classified among the advanced activities. These display the highest decrease in average preferential tariff rates between 1991 and 2004. The same does not occur for low tech and resource based manufacturing: furniture, footwear and food products experiment the lowest increase in preferential treatment.

To appreciate the evolution of the access into partner countries' markets table 4 shows the ratio of average preferential tariff respectively faced by small and big countries within the agreement.

The number displayed is the ratio between the average preferential rate applied by Brazil and Argentina and the average preferential rate applied by Paraguay and Uruguay. A value major than 1 implies that the average preferential tariff applied by big countries is higher than the one faced by big countries when accessing small countries' markets. Before the 90s a value higher than 1 implies that the average tariff applied by small countries is lower than the one applied by big partners. Things substantially change in the post agreement subperiod with the average tariff faced by small countries declining in relative terms in the advanced, medium and low tech sectors. In the resource based manufacturing sectors, the weighted average of tariffs applied by small countries is higher than the one applied by larger partners, though the value of the ratio increases from the 90s implying that average tariffs applied by smaller countries decline more rapidly than tariffs applied by larger partners.

Table 4: Partners' average tariffs

	Advanced	Low Tech	Medium Tech	Resource Based
1985-1990	2.14	1.17	1.44	1.13
1991-1994	1.22	0.43	0.36	**0.50**
1995-1998	0.44	0.21	0.21	**0.52**
1999-2004	**1.19**	**0.40**	**0.27**	**0.77**

Source: ALADI. Own computation.

Each column of table 15 in appendix shows the relative market access between the pair of countries within the agreement indicated on the first row. Here numbers in bold indicate reduced relative market access: Argentina liberalization path is slower in almost all the categories with respect to any of the partners with the only exception of medium tech products with respect to Uruguay until the end of the 90s. The ratio between Argentina's tariffs and the partners' ones is often more than one implying a relative higher level of protection for the country in the sub-regional market. Uruguay market access in Paraguay is reduced in low and resource based sectors. Brazil tariffs in general decline during the 90s, market access for the resource based manufacturing is anyway slightly reduced during 1999-2004 .

Summing up, despite a sharp decline in in intra-regional tariffs, building on the data available the liberalization process has not proved to be a symmetrical one among sectors. Declining tariffs have especially concerned advanced products with resource based and low tech manufacturing keeping the lowest preferential margins. Furthermore, tariff reductions have been more favorable for smaller countries although the path of liberalization in resource based products has been lower and slower in Argentina especially. The liberalization process has anyway affected trade flows. The evidence emerging from table 5 suggests an important role for the sub-regional market during the 90s for all of the countries involved, though, an overall decline in intra-regional trade shares emerges in the last part of the period under analysis. It is no surprise that the sub-regional market is much more important for smaller countries with intra-regional trade accounting on average

for more 40% of their overall trade. Table 6 shows that the exports of advanced, medium technology and resource based manufacturing products are increasingly important during the period [3]

Yeats (1998) reports important trade diversion effects from the formation of MERCOSUR. According to its study the most dynamic (fast-growing) products in Mercosur's intra-trade generally are capital-intensive goods in which members have not displayed a strong export performance in outside markets. Neither the RCA indices nor statistics about factor proportions indicate that Mercosur has a comparative advantage in those products. Carrillo and A-li (2003) report that the bloc formation has actually affected the exchange of capital goods. Very recently, Volpe Martincus and Sanguinetti (2005) study the relation between the bloc formation and export specialization focusing on the analysis of the re-orientation of exports between 1987 and 1998 for Argentina, Brazil, Chile and Uruguay. They find that preferential trade liberalization is an important factor explaining the tendency towards sectoral divergence of geographical patterns in the larger MERCOSUR partners: Argentina and Brazil have a stronger re-orientation of exports towards the region in those industrial sectors with higher preferential margins.

Table 5: Share of trade towards the subregion over overall countries external trade

	ARG	BRA	PRY	URY
1985-1990	0.14	0.07	0.48	0.37
1991-1994	0.21	0.12	0.41	0.44
1995-1998	0.26	0.15	0.54	0.49
1999-2004	0.23	0.10	0.55	0.42

Source COMTRADE-WITS. Own calculations.

According to the theory previously discussed the formation of a South-South RTA would enhance the importance of regional comparative advan-

[3]In more detail, table 16 in appendix B shows that smaller partners lose market shares in terms of exports to the region in all the sectors , while Argentina gains in almost all the sectors and Brazil improves its strong position in the low technology sectors.

Table 6: Regional shares of exports by manufacturing category

	Advanced	Low Tech	Medium Tech	Resource Based
1985-1990	0.27	0.11	0.06	0.28
1991-1994	0.28	0.12	0.07	0.26
1995-1998	0.29	0.11	0.07	0.30
1999-2004	0.30	0.08	0.08	0.29

Source COMTRADE-WITS. Own calculations.

tage both in determining trade specialization patterns and in shaping the distribution of economic activity among partner countries. To highlight the evolution of MERCOSUR countries trade specialization before and after the agreement the Balassa Revealed Comparative Advantage (RCA) is going to be shown. The general calculation of this index implies the weighting of countries' sectoral export shares by the world export shares in the same sector. This procedure, however, would highlight that countries in the region are typically more specialized in primary and mining products and in resource based manufacturing when compared to the rest of the world. More interestingly, weighting countries' sectoral export shares by the regional export shares in the same sector the revealed comparative advantage with respect to the region can be obtained. From this piece of information it is possible to analyze the change in trade specialization during the agreement period and, then, to have a guess about the relation of the South-South RTA formation and the reshaping of CA in the region. The calculation of the RCA index with respect to the region is made through the subsequent formula:

$$RCA_{ik} = \frac{\frac{\frac{x_{ik}}{x_i}}{\frac{x_{rk}}{x_r}} - 1]}{\frac{\frac{x_{ik}}{x_i}}{\frac{x_{rk}}{x_r}} + 1]} \tag{1}$$

with $\frac{x_{ik}}{x_i}$, representing country i's share of exports of product k over total country i's exports and $\frac{x_{rk}}{x_r}$ representing the region export share of product

Table 7: RCA index with respect to the region

	Advanced	Low Tech	Medium Tech	Resource Based
ARG				
1985-1990	-0.258	-0.185	-0.318	0.152
1991-1994	-0.199	-0.320	-0.437	0.182
1995-1998	-0.141	-0.286	-0.327	0.113
1999-2004	-0.179	-0.293	-0.366	0.129
BRA				
1985-1990	0.085	0.042	0.089	-0.067
1991-1994	0.079	0.081	0.117	-0.102
1995-1998	0.081	0.097	0.123	-0.084
1999-2004	0.083	0.093	0.118	-0.090
PRY				
1985-1990	-0.718	-0.491	-0.976	-0.166
1991-1994	-0.719	-0.151	-0.873	-0.064
1995-1998	-0.742	-0.054	-0.703	-0.039
1999-2004	-0.756	-0.132	-0.700	0.076
URY				
1985-1990	-0.513	0.224	-0.186	0.124
1991-1994	-0.373	0.159	-0.084	0.121
1995-1998	-0.382	0.157	-0.047	0.177
1999-2004	-0.425	0.134	0.014	0.221

Source COMTRADE-WITS. Own calculations.

k over the whole of regional exports. The RCA index in equation 1 is shown in its symmetric version and ranges between -1 and 1, with positive values implying a revealed comparative advantage in that specific product and 0 indicating the threshold between specialization and non-specialization (negative values). Results from the computation of the index are shown in table 7.

The general insight from the table is the increased degree of specialization in resource based manufacturing products for Paraguay and Uruguay. Brazil trade specialization in advanced, medium and low tech products improves and Argentina which is specialized in resource based manufacturing, improves its weak position in the advanced, low and medium tech sectors.

3 Patterns of countries specialization and geographic concentration of production

From the previous section then, trade liberalization has actually occurred within the MERCOSUR region although some differences in he path of liberalization have emerged among sectors and countries. Trade flows have been fostered especially in the advanced and medium tech products and countries export specialization has not changed: in most of the cases the original export specialization with respect to partners has strengthen. This section, then is devoted to the description of the evolution of the distribution of economic activity within the bloc. The main question to be answered is whether countries are more specialized according to regional comparative advantage after the formation of the agreement. As a consequence, another matter concerns the degree of concentration of economic activity within the region: is it more or less localized than before? what are the sectors with a higher degree of localization?

To ascertain the pattern of the degree of specialization and geographic concentration of industrial sectors within MERCOSUR and MERCOSUR partners, the entropy indexes will be used.

The index specified in equation 2 measures the degree of specialization of country i with $\frac{x_{ik}}{x_i}$ measuring the share of production of good k over the whole of country i industrial production. The index ranges between 0 (complete specialization) and lnk (complete de-specialization), then lower the degree of specialization.

$$Spec_i = -\sum_k \frac{x_{ik}}{x_i} * ln(\frac{x_{ik}}{x_i}) \tag{2}$$

In order to calculate the overall degree of specialization within a specific bloc, equation 3 shows that the $Spec$ index can be averaged by means of weights equal to each country weight on the total regional production.

$$Reg.Spec. = -\sum_i \frac{x_i}{x_r} * Spec_i \tag{3}$$

Similar indexes are calculated to compute the degree of concentration of a single sector or of the whole of manufacturing within a region according to equations 4 and 5.

$Conc_k$ measures the degree of geographic concentration of sector k within the region and $Reg.Conc.$ measures average concentration within the region

$$Conc_k = \sum_i \frac{x_{ik}}{x_i} * ln(\frac{x_{ik}}{x_i}) \tag{4}$$

$$Reg.Conc. = \sum_k \frac{x_{rk}}{x_r} * Conc_k \tag{5}$$

The calculation of the indexes of specialization and concentration for the whole MERCOSUR region and for the sub-periods 1985-1990, 1991-1994,1995-1998, 1999-2004 is presented in the first four lines of table 8. While specialization increases in the bloc during the whole time span, the 1991-1994 period displays a reduced level of geographic concentration of industrial production. From the lower part of the table, countries appear to be more and more specialized and a hint of industrial dispersion is only related to the 1991-1994 period for all the categories of manufacturing under analysis. From 1995 onwards the sharpest increase in geographical concentration is observed in the advanced sectors, followed by medium and low tech sectors respectively.

This evidence strengthens the above suspicion of localization of economic activities in larger partners, though, to have a better understanding of production location patterns, two relative measures of specialization and concentration are obtained from those in equations 2 and 4 weighting countries and sectors' shares by region shares, x_{rk}/x_r. Table 9 then shows that while the largest country in the bloc increases its degree of dispersion with respect to the partners during the 90s, Argentina, Paraguay and Uruguay dramatically increase their specialization after 1991. Results on relative concentration

Table 8: Specialization and Concentration: averaged data

		reg.Spec.	reg.Conc.	
1985-1990		74.97	2.58	
1991-1994		73.20	2.80	
1995-1998		73.00	2.59	
1999-2004		72.65	2.20	
	ARG	BRA	PRY	URY
1985-1990	2.49	2.89	2.21	2.66
1991-1994	2.45	2.86	2.21	2.56
1995-1998	2.44	2.83	2.17	2.42
1999-2004	2.40	2.78	2.13	2.23
	Advanced	Low Tech	Medium Te	Resource
1985-1990	0.516	0.603	0.622	0.848
1991-1994	0.568	0.702	0.737	0.852
1995-1998	0.490	0.668	0.673	0.843
1999-2004	0.393	0.556	0.567	0.835

Table 9: Growth in Relative Specialization and Concentration

	ARG	BRA	PRY	URY
1985-1990/1991-1994	1.55	-0.76	0.24	0.24
1991-1994/1995-1998	-8.59	0.33	-0.75	-1.22
1995-1998/1999-2004	-2.07	0.58	-0.42	-0.41
	Advanced	Low Tech	Medium Tech	Resource Based
1985-1990/1991-1994	-0.06	0.67	-0.01	0.09
1991-1994/1995-1998	0.08	-0.14	0.87	-0.54
1995-1998/1999-2004	0.04	3.58	0.15	-0.35

bear quite different insights with respect to the absolute level of concentration in table 8: the degree of dispersion increases in the advanced and medium technology sectors relatively to the whole of economic activity in the region especially between 1991 and 1998 and especially for the medium tech sectors; production, instead, appears to be more and more localized in the resource based manufacturing and to a lesser extent in the low tech sectors between 1991 and 1998.

Finally, table 10 shows the symmetric version of the Balassa Index calculated according to the formula in equation 1 using data on production.

Apart from the Brazil, all the countries in the bloc experience an increasing specialization in the resource based manufacturing products. Partially mirroring the evidence on trade specialization, Argentina slightly improves its position in the advanced and medium tech sectors in the first half of the period, and in low tech products during the 90s. Paraguay also improves its specialization in low tech products, its market share though is very low [4]

4 Discussion of the Evidence

From the previous sections some tentative and preliminary conclusions can be drawn. Average preferential tariffs in general decline within the bloc, the average tariffs for low tech and resource based products, though are the ones experimenting the slowest decline. When looking in more detail at the evolution of relative protection, the weighted average of the tariff applied by larger countries to smaller ones is lower than the one faced by the former in the latter's markets and it is declining during the 90s. The only exception is represented by the resource based products for which the average tariff applied by larger partners increases relative to the one applied by smaller ones. In general, though, the relative level of protection of big partners goes back to higher levels in the period 1999-2004, especially in the advanced sectors.

For Argentina, a possible consequence of the relatively more favorable market access in partner countries could be its increasing shares of exports

[4]Cfr.table 17 in appendix B. In the upper part of table 17 in appendix B the evolution of regional production shares by manufacturing categories is shown: the highest and increasing share in regional production is represented by the advanced manufacturing production, low and resource based manufacturing products display a declining regional share and the medium tech category stays unchanged. The lower part displays a more detailed information: smaller partners loose ground in all sectors with the exception of the resource based sector in Uruguay from the 90s. Brazil definitely gains in all the sectors from 1990 onwards, and Argentina spreads its production of low tech manufacturing until the end of the 90s and of advanced and medium technology products until 1994, definitely loses shares in the resource based manufacturing.

Table 10: Production Specialization

	Advanced	Low Tech	Medium Tech	Resource Based
ARG				
1985-1990	-0.17	-0.03	-0.14	**0.18**
1991-1994	-0.15	-0.09	-0.10	**0.18**
1995-1998	-0.20	-0.02	-0.13	**0.20**
1999-2004	-0.24	-0.04	-0.11	**0.24**
BRA				
1985-1990	0.06	0.01	0.04	-0.10
1991-1994	0.08	0.04	0.05	-0.15
1995-1998	0.07	0.01	0.05	-0.13
1999-2004	0.06	0.01	0.03	-0.11
PRY				
1985-1990	-0.66	0.09	-0.25	**0.28**
1991-1994	-0.64	**0.09**	-0.22	**0.25**
1995-1998	-0.68	**0.13**	-0.27	**0.29**
1999-2004	-0.76	**0.11**	-0.27	**0.34**
URY				
1985-1990	-0.29	-0.03	0.09	**0.19**
1991-1994	-0.31	-0.06	0.07	**0.19**
1995-1998	-0.43	-0.19	0.02	**0.31**
1999-2004	-0.45	-0.29	0.00	**0.36**

in the regional market in the low and medium tech products until 1998, and in the advanced and resource based manufacturing products (until the end of the period) also. This pattern is partially mirrored in an improved revealed comparative advantage in advanced, low and medium tech sectors during the 90s.

Small countries, instead, lose export shares in the regional market, Uruguay though appears more specialized in resource based manufacturing and, during the 90s, Paraguay improves its weak specialization in the same category and in the low tech products too. Brazil comparative advantages do not change substantially apart from an increase of specialization in the low tech category, mirrored in the higher absolute shares of exports within the market.

Summing up, from data on tariffs and trade emerges a relatively more favorable market access for Argentina, possibly mirrored in higher exports and improved export specialization with respect to the partners. A more or less stable position for Brazil and a sort of anchoring to resource based sectors for smaller partners.

Mimicking what observed in exports, the highest bulk of regional production is represented by advanced and resource based products with a particular growing role for the former. The "playing field" is not an even one, though: before integration in 1991, Brazil could account for more than three quarters of advanced, low and medium tech manufacturing production and for more than a half of resource based manufacturing products.

Argentina gets to acquire some of the regional production in the advanced sectors between 1985 and 1994 and of the medium and low tech sectors until the last part of the 90s. Uruguay improves its position in the resource based manufacturing until the end of the 90s, Brazil also gains regional production shares in these sectors until the end of the period. It is worth to notice that Brazil relative protection in the resource based manufacturing declines for all the 90s and goes back to a higher level in the 1999-2004 period, this might coincide with Uruguay loss of shares in the same period and with Argentina steepest decline from 43% in 1995-1998 to 35% in 1999-2004.

As a consequence, the distribution of economic activity is not so different from the beginning of the period, Brazil comes out with an improved position in all the sectors. The index of relative specialization and concentration, in fact, reveal the increasing specialization of Argentina, Paraguay and Uruguay and the consequent higher dispersion of economic activity in Brazil after the first part of the integration process. At the same time the advanced, medium and low tech manufacturing sectors appear to be more dispersed in the 90s than before, while the same does not occur for the resource based products.

Thinking about the implications of the formation of the South-South RTA for the reshaping of comparative advantages and location of production, the suspicion of an uneven distribution of economic activity between large and small partners after the formation of MERCOSUR emerges from the previous empirical evidence. A relatively freer access to partners countries' market has possibly helped Argentina to improve its position within the region both in export and production shares. If a process of diffusion of economic activity is at work concerns the spreading of some industries between Brazil and Argentina during the 90s. Nevertheless, only Brazil ends up with a more differentiated production structure with respect to the region, while the remaining countries experience an increasing specialization, that hinges on the resource based manufacturing sectors.

At this point the relation between the bloc formation and the subsequent patterns of production needs to be tested.

To this purpose, an empirical model will be estimated where, once accounted for country and industry specific factors affecting the distribution of activities within an integrated bloc, the specific role of the formation of a RTA in reshaping comparative advantages and enhancing concentration/diffusion of production will be tested.

5 The Empirical Model and the Estimation Strategy

This section is devoted to highlight the role of the formation of the South-South RTA in shaping of industrial location within the MERCOSUR region. In order to study the effects of geography and comparative advantage on industrial location in Europe, Midelfart-Knarvik et. al (2000) have developed a trade model allowing for different endowments, final demand effects and demand and cost linkages on intermediate inputs. Linearizing the model gives relative shares as predicted by the interactions by location characteristics and industry factor intensities. The same model is going to be used in this empirical analysis, though the role of the RTA is specifically taken into account by the interaction between the above mentioned interactions and the information on intra-regional tariffs and preferential margins. The model to estimate is the following

$$\Delta s_{ikt} = \alpha_0 + \sum_j \beta_j Z_{it} + \sum_j \gamma_j I_{kt} + \sum_j \delta_j Z_{it} I_{kt} + \sum_j \varepsilon_j pref_{ikt} Z_{it} I_{kt} + \theta_i + \eta_k + \tau_t + \epsilon_{ikt} \tag{6}$$

here Δs_{ikt} measures country i change in the degree of specialization in product k, as a matter of fact $s_{ikt} = \frac{x_{ikt}/X_{kt}}{x_{it}/X_t}$ measures the share of country i's industry k in the total regional industry k production (x_{ikt}/X_{kt} with x_{ikt} measuring country i's industry k production and X_{kt} measuring the regional production of k) normalized by the country weight in total manufacturing in the region(x_{it}/X_t with x_{it} measuring total country i's manufacturing production and X_t measuring total regional manufacturing production), Z_{it} and I_{kt} are respectively country i and industry k's characteristics affecting the location of k production in i, the following term is the interaction between the previous ones, and $pref_{ikt}$ measures the preferential tariff applied by partners to country i's product k a θ_i, η_k and τ_t represent country and industry

specific fixed effects and finally ϵ_{ikt} is a time-varying shock. [5]

- country specific factors: the arable land area, the population education level (measured as the secondary school enrolment rate)and the total labor force are introduced to measure countries'factor endowments; the economy market potential, *MP*, introduced to measure final demand effects;

- industry specific factors: labor intensity is detected by the share of employees over sector gross production, skill intensity by the share of non production workers, scale economies are detected by means of the number of establishments over sector gross output, the share of intermediate inputs over sector output is meant to measure the potential of sector forward linkages and finally agricultural intensity is measured by means of a dummy taking value one for resource based sectors[6] ;

- interactions: country specific factors are interacted with industry specific ones. Countries' labor force is interacted with labor intensity. Countries'population education level is interacted with skill intensity and market potential is interacted with the scale economy intensity.

Model 6 will be estimated both as above and substituting the preferential tariff, $pref_{ikt}$, with the preferential margin, $marg_{ikt}$ i.e. the difference between the MFN and preferential tariffs, over the MFN tariff, applied by partners in the agreement. The idea is that integration through the formation of a PTA not only implies the liberalization process witnessed by the reduction in intra-regional tariffs, but it implies also a wedge between tariffs applied to partners and tariffs applied to the rest of the world. This

[5]It is worth to notice that the dependent variable can be interpreted both as a specialization and a localization measure.
As a matter of fact $s_{ikt} = \frac{x_{ikt}/X_{kt}}{x_{it}/X_t} = \frac{x_{ikt}/x_{it}}{X_{kt}/X_t}$ so that it represents an index of country i's production specialization in industry k and the localization of industry k in country i relative to the localization of activity a a whole in i

[6]Excluding Coke and Petroleum

wedge may create substantial changes in the pattern of trade and then in the pattern of production.

Model 6 will be estimated by means of OLS and Within Group estimator controlling for heteroskedasticity and first order autocorrelation in the error term. The possible endogeneity of the right hand side variables is taken into account using lagged their values as regressors. Finally, in order to control for potential measurement errors and to avoid that short-run fluctuation in the regressors affect the estimation results the estimation of the empirical model has been done averaging the data within two and seven-year subperiods. Results from the estimation of the empirical model are shown in tables 11-12. The two table respectively show results when the preferential tariffs and margins are used to identify the effect of the formation of the RTA. Within each table, instead each pair of columns respectively display results for the whole sample, for the big partners and for the small ones. Complete results with the coefficients for the country and industry specific factors are displayed in appendix B in tables 18 - 21.

Summarizing results from table **??**, agriculture intensive industries do locate in agriculture abundant countries, and countries with higher market potential do attract countries with a higher share of intermediate inputs. The liberalization process with a reduction in tariffs strengthen the degree of specialization and concentration. The inverse relation implied by the negative sign on the coefficient for the interaction of the preferential tariff with $agr. * agr.int.-1$ suggests that a declining path of internal tariffs fosters localization of agricultural activities in agriculture abundant countries. The significance of the effect is higher for smaller partners when two year averages of the data are used and the size of the coefficient is even bigger when 7 year averages are used, though the significance is reduced.

Again the negative sign on $pref * mktpot * interm. - 1$ shows that the process of intra-regional liberalization has enhanced the operating of the forces of geography and cumulative causation for industries with a higher share of intermediates which tend to locate in countries with a higher market

potential. The latter effect is stronger for larger partners and non significant for smaller ones.

The remaining interaction terms are not always significant, the interaction between skill intensity and skill endowments , for example, when significant shows a negative sign implying a lower level of specialization for countries endowed with skilled labor in skill intensive industries. The effect of the interaction between the preferential tariff and $skill * skillint. - 1$ suggests that a reduction in tariffs increases the degree of dispersion of skill intensive industries. This result though is not uniform since the positive sign is maintained only for larger partners with smaller once facing an increased degree of specialization in skill intensive industries as the liberalization process takes pace. The effect, anyhow is not significant especially when fixed effects are taken into account.

Table 12 partially confirm the above results: higher preferential margins are associated with a higher degree of specialization in agriculture intensive industries. Furthermore, preferential margins do not seem to affect the degree of concentration induced by the operating of geography forces.

Table 11: Results-Preferential Tariff

	ALL				BIG				SMALL			
	2 -YEAR AV.		7-YEAR AV		2 -YEAR AV.		7-YEAR AV		2 -YEAR AV.		7-YEAR AV	
VAR./EST.	OLS	FE	OLS	FE	OLS	FE	OLS	FE	OLS	FE	OLS	FE
agr.*agr.int.-1	0.841***	1.137***	3.106***	3.380***	0.403*	0.199	2.119***	1.097	2.115***	2.496***	2.58	4.633**
	[0.243]	[0.341]	[0.727]	[0.760]	[0.239]	[0.323]	[0.512]	[0.726]	[0.604]	[0.591]	[1.662]	[1.976]
pref*agr.*agr.int.-1	-0.176***	-0.094	-0.635***	-0.577***	-0.069	-0.081	-0.440***	-0.795*	-0.298***	-0.383***	-0.234	-0.835*
	[0.052]	[0.072]	[0.164]	[0.206]	[0.053]	[0.092]	[0.123]	[0.448]	[0.113]	[0.129]	[0.338]	[0.428]
lab*lab.int.-1	-0.001	-0.001***	-0.002**	0.001	0	-0.002	0	0.001	-0.002	-0.005**	-0.005	0.003
	[0.000]	[0.000]	[0.001]	[0.001]	[0.000]	[0.001]	[0.001]	[0.004]	[0.002]	[0.002]	[0.004]	[0.008]
pref*lab*lab.int.-1	0	0	0	0	0	-0.000*	0	0	0	0	0.001	0
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.002]
skill*skill int.-1	-0.633	-0.48	-6.181***	-1.916	-0.897*	-0.685	-3.511***	-2.96	0.631	-3.819*	-0.121	1.367
	[0.392]	[0.473]	[1.176]	[1.696]	[0.490]	[0.547]	[1.088]	[2.021]	[2.026]	[2.017]	[5.186]	[8.059]
pref*skill*skill int.-1	0.139	0.086	1.349***	0.439	0.185*	0.132	0.733***	0.591	0.021	0.803	-4.485**	-3.581
	[0.085]	[0.099]	[0.251]	[0.305]	[0.106]	[0.115]	[0.227]	[0.372]	[0.649]	[0.538]	[1.977]	[3.738]
pref*mkt pot.-1	-0.104*	-0.028	-0.618***	0.172	-0.056	0.006	-0.256*	-0.071	-0.05	-0.608	2.689**	2.188
	[0.057]	[0.070]	[0.155]	[0.238]	[0.061]	[0.082]	[0.142]	[0.232]	[0.350]	[0.376]	[1.110]	[2.503]
scale*scale int.-1	0	0	0	0	0	0	0	0	0	-0.001	0.002	0.001
	[0.000]	[0.000]	[0.001]	[0.001]	[0.000]	[0.000]	[0.001]	[0.001]	[0.001]	[0.001]	[0.003]	[0.007]
pref*scale*scale int.-1	0	0	0	0	0	0	0	0	0	0	0	0
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.001]
mkt pot*interm	0.183***	0.220***	0.273***	0.322***	0.171***	0.194***	0.260***	0.348***	0.265***	0.274***	0.392***	0.304**
	[0.034]	[0.040]	[0.054]	[0.075]	[0.024]	[0.035]	[0.063]	[0.094]	[0.050]	[0.063]	[0.084]	[0.112]
pref*mkt pot*interm.-1	-0.048**	-0.136**	-0.129**	-0.358*	-0.071*	-0.101	-0.150*	-0.214	-0.025	-0.017	0.073	0.063
	[0.022]	[0.062]	[0.053]	[0.193]	[0.039]	[0.086]	[0.083]	[0.267]	[0.087]	[0.252]	[0.239]	[0.905]

Table 12: Results-Preferential Margin

	ALL				BIG				SMALL			
	2 -YEAR AV.		7-YEAR AV		2 -YEAR AV.		7-YEAR AV		2 -YEAR AV.		7-YEAR AV	
VAR./EST.	OLS	FE	OLS	FE	OLS	FE	OLS	FE	OLS	FE	OLS	FE
agr.*agr.int.-1	-0.033	0.364	-0.106	0.133	0.066	-0.591	0.146	-2.558	0.563**	0.592	0.998**	0.389
	[0.074]	[0.346]	[0.206]	[0.727]	[0.071]	[0.416]	[0.165]	[2.137]	[0.251]	[0.447]	[0.429]	[1.079]
marg*agr.*agr.int.-1	0.108***	0.101***	0.255***	0.304**	0.063**	0.092**	0.254***	0.419*	0.115**	0.154**	0.164	0.246
	[0.028]	[0.036]	[0.095]	[0.116]	[0.028]	[0.046]	[0.081]	[0.221]	[0.052]	[0.064]	[0.159]	[0.215]
lab*lab.int.-1	-0.000**	-0.001***	0	-0.001	-0.001**	-0.003*	-0.003***	-0.003	0.001	-0.001	-0.005	0.028
	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]	[0.002]	[0.001]	[0.004]	[0.003]	[0.003]	[0.012]	[0.026]
marg*lab*lab.int.-1	0	0	-0.000*	0	0.000*	0.000**	0.000***	0.000*	0	-0.000*	0	-0.001
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.001]
skill*skill int.-1	0.056	-0.008	0.411***	0.166	0.028	-0.015	0.113	-0.112	0.235	-0.263	-26.602*	-0.263
	[0.042]	[0.081]	[0.108]	[0.236]	[0.043]	[0.057]	[0.092]	[0.226]	[1.717]	[1.540]	[13.402]	[20.382]
marg*skill*skill int.-1	-0.033	-0.025	-0.453***	-0.18	-0.078	-0.061	-0.305**	-0.275	0.091	-0.218	1.970*	-0.259
	[0.039]	[0.050]	[0.079]	[0.117]	[0.051]	[0.058]	[0.128]	[0.167]	[0.234]	[0.203]	[1.040]	[1.710]
marg*mkt pot.-1	0.028	0.023	0.270***	0.189	0	-0.016	0.02	-0.042	-0.016	0.217	-1.103	0.41
	[0.036]	[0.047]	[0.077]	[0.164]	[0.041]	[0.056]	[0.123]	[0.167]	[0.159]	[0.145]	[0.674]	[1.259]
scale*scale int.-1	0	0	0	-0.001	0.001	0	0.002	-0.003	0.001	0.001	0	0.016
	[0.000]	[0.000]	[0.000]	[0.001]	[0.001]	[0.001]	[0.002]	[0.002]	[0.001]	[0.001]	[0.002]	[0.055]
marg*scale*scale int.-1	0	0	0	0	0	0	0	0	0	0	0	-0.001
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.004]
mkt pot*interm	0.169***	0.213***	0.251***	0.301***	0.162***	0.189***	0.258***	0.343***	0.261***	0.278***	0.385***	0.285**
	[0.034]	[0.040]	[0.054]	[0.066]	[0.025]	[0.035]	[0.061]	[0.085]	[0.049]	[0.060]	[0.080]	[0.133]
marg*mkt pot*interm.-1	-0.01	0.017	-0.08	0.002	0.037	0.031	0.084	0.121	0.037	0.056	-0.054	0.162
	[0.031]	[0.038]	[0.091]	[0.102]	[0.028]	[0.029]	[0.063]	[0.086]	[0.074]	[0.089]	[0.204]	[0.235]

6 Preliminary conclusion

This paper has addressed the relation between the formation of South-South RTAs and the distribution of economic activity focusing on the case of MERCOSUR between 1985 and 2004. The evidence of increased intra-regional preferential liberalization has gone hand in hand with increasing specialization in trade and production especially for smaller partners which hinge more and more on resource based and low skill intensive productions. The preliminary results from the estimation of an empirical model testing the relation between comparative advantage, geography and location of production takes the specific role of economic integration by means of the interaction between the preferential tariffs and margins and the endowment and factor intensity variables. Results suggest that intra-regional liberalization has been relevant in enhancing comparative advantage for resource abundant countries fostering their specialization in resource based products. The effect is larger and particularly significant for smaller partners. Intra-regional liberalization, furthermore, appears to have enhanced the operating of agglomeration forces.

Preferential margins again foster concentration of agriculture intensive activities in agriculture abundant countries, especially for larger partners.

7 References

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A.Data

A.Tables

Table 13: ISIC-Sectors and typology

isic rev.2	type	isic rev.2	type
111	Primary and mining	341	Medium Tech
113	Primary and mining	342	Medium Tech
121	Primary and mining	351	Advanced
122	Primary and mining	352	Advanced
130	Primary and mining	353	Resource Based
210	Primary and mining	354	Resource Based
220	Primary and mining	355	Medium Tech
230	Primary and mining	356	Medium Tech
290	Primary and mining	361	Medium Tech
311	Resource Based	362	Medium Tech
312	Resource Based	369	Medium Tech
313	Resource Based	371	Low Tech
314	Resource Based	372	Low Tech
321	Low Tech	381	Low Tech
322	Low Tech	382	Advanced
323	Low Tech	383	Advanced
324	Low Tech	384	Advanced
331	Low Tech	385	Advanced
332	Low Tech	390	Low Tech

Path of intra-regional liberalization

Table 14: Preferential Tariffs by ISIC sectors: 1991-2004

Type	Description	Product	growth 1991-2004	91-92
Low Tech	wood prod.	331	-100.00	11.90
Resource Based	oil and coke	354	-100.00	4.52
Medium Tech	rubber	355	-100.00	10.66
Medium Tech	ceramic	361	-100.00	7.69
Low Tech	other	390	-100.00	9.31
Advanced	transp. Equip.	384	-99.95	11.24
Advanced	scient. Eq.	385	-99.92	8.50
Advanced	electric mach.	383	-99.91	8.39
Advanced	chemicals	351	-99.88	4.17
Advanced	mach. No electr.	382	-99.81	6.86
Low Tech	textiles	321	-99.72	12.73
Medium Tech	glass	362	-99.62	8.33
Advanced	other chem.	352	-99.53	6.74
Low Tech	metal prod.	381	-99.38	9.42
Medium Tech	no metal min.	369	-99.33	8.90
Medium Tech	paper and prod.	341	-99.32	8.95
Low Tech	no ferrous met.	372	-99.31	4.72
Low Tech	iron and steel	371	-99.13	6.63
Resource Based	oil ref.	353	-98.83	3.94
Medium Tech	plastic prod.	356	-98.67	13.64
Resource Based	other food	312	-98.37	9.12
Low Tech	leather	323	-98.30	9.17
Low Tech	wearing apparel	322	-98.07	14.31
Resource Based	drinks	313	-98.05	12.33
Medium Tech	printing and publishing	342	-96.63	9.56
Resource Based	tobacco	314	-96.57	20.81
Low Tech	footwear	324	-96.53	22.49
Low Tech	furniture	332	-95.57	19.13
Resource Based	food products	311	-95.26	8.78

Table 15: Partners' average tariffs

advanced	BRA-ARG	ARG-PRY	ARG-URY	BRA-PRY	BRA-URY	PRY-URY
1985-1990	1.56	**2.65**	1.31	4.14	2.04	0.49
1991-1994	0.86	**3.65**	**1.26**	3.13	1.08	0.34
1995-1998	0.00	**12.51**	**1.58**	0.00	0.00	0.13
1999-2004	0.00	3.96	**5.84**	0.00	0.00	1.47
low tech						
1985-1990	1.30	**0.91**	0.94	1.18	1.22	1.03
1991-1994	0.39	**1.11**	**0.85**	0.44	0.33	**0.76**
1995-1998	0.00	**1.12**	**1.07**	0.01	0.00	**0.96**
1999-2004	0.00	1.05	**3.25**	0.00	0.00	**3.09**
medium tech						
1985-1990	1.51	**1.24**	0.99	1.88	1.50	0.80
1991-1994	0.38	**1.39**	0.78	0.53	0.30	0.56
1995-1998	0.06	**3.95**	0.88	0.25	0.05	0.22
1999-2004	0.00	0.94	1.97	0.00	0.00	2.09
resource based						
1985-1990	1.49	1.12	0.81	1.66	1.21	0.73
1991-1994	0.40	1.23	**0.70**	0.49	0.28	**0.57**
1995-1998	0.08	1.14	**1.04**	0.09	0.08	**0.91**
1999-2004	0.26	0.56	**2.40**	0.15	0.62	**4.25**

Source: ALADI. Own computation.

Table 16: Share of exports towards the subregion over total MERCOSUR exports

	Advanced	Low Tech	Medium Tech	Primary and Mining	Resource Based
ARG					
1985-1990	0.32	0.29	0.34	0.46	0.40
1991-1994	0.28	0.24	0.18	0.70	0.45
1995-1998	0.38	0.30	0.31	0.74	0.51
1999-2004	0.40	0.29	0.29	0.72	0.57
BRA					
1985-1990	0.59	0.52	0.50	0.23	0.25
1991-1994	0.67	0.63	0.72	0.15	0.34
1995-1998	0.58	0.57	0.59	0.11	0.27
1999-2004	0.57	0.63	0.60	0.12	0.22
PRY					
1985-1990	0.01	0.05	0.00	0.24	0.09
1991-1994	0.00	0.05	0.00	0.11	0.05
1995-1998	0.00	0.04	0.01	0.09	0.05
1999-2004	0.00	0.03	0.01	0.13	0.08
URY					
1985-1990	0.08	0.14	0.16	0.07	0.26
1991-1994	0.05	0.08	0.10	0.04	0.16
1995-1998	0.04	0.08	0.09	0.05	0.17
1999-2004	0.03	0.05	0.10	0.03	0.14

Source COMTRADE-WITS. Own calculations.

Trade Patterns

Table 17: Regional production shares by category and country

	Advanced	Low Tech	Medium Tech	Resource Based
1985-1990	0.30	0.17	0.09	0.44
1991-1994	0.29	0.16	0.09	0.47
1995-1998	0.33	0.14	0.09	0.44
1999-2004	0.35	0.14	0.09	0.43
	ARG	BRA	PRY	URY
Advanced				
1985-1990	0.181	0.808	0.002	0.009
1991-1994	0.245	0.744	0.002	0.010
1995-1998	0.197	0.796	0.001	0.006
1999-2004	0.130	0.865	0.001	0.004
Low Tech				
1985-1990	0.240	0.734	0.010	0.016
1991-1994	0.276	0.698	0.010	0.016
1995-1998	0.279	0.702	0.009	0.010
1999-2004	0.196	0.790	0.008	0.006
Medium Tech				
1985-1990	0.193	0.782	0.005	0.020
1991-1994	0.274	0.700	0.005	0.021
1995-1998	0.225	0.756	0.004	0.015
1999-2004	0.173	0.812	0.004	0.011
Resource Based				
1985-1990	0.373	0.587	0.015	0.024
1991-1994	0.483	0.475	0.014	0.027
1995-1998	0.435	0.524	0.013	0.028
1999-2004	0.346	0.617	0.013	0.024

Production Patterns

Table 18: Results-two-year averages-Preferential Tariff

	ALL		BIG		SMALL	
	OLS	FE	OLS	FE	OLS	FE
mkt pot.-1	0.583**	1.866*	-2.374**	-1.541	-1.999	4.955**
	[0.273]	[1.070]	[1.205]	[1.386]	[2.278]	[2.288]
arable land-1	-0.369***	-2.176***	-0.749	-0.759	-5.052**	-2.812
	[0.125]	[0.372]	[0.597]	[0.592]	[2.249]	[1.965]
lab.-1	0.089***	1.851***	-1.134***	-2.061**	4.407***	5.390***
	[0.025]	[0.466]	[0.435]	[1.018]	[1.468]	[1.301]
skill-1	0.159**	0.085	-0.048	-0.061	0.172	-15.898***
	[0.072]	[0.159]	[0.225]	[0.230]	[2.338]	[5.817]
agr.int.	0.041	0	-0.155	0	-1.275***	0
	[0.164]	[0.000]	[0.141]	[0.000]	[0.455]	[0.000]
lab.int.-1	0.003*	0.012***	0.011	0.051	0.011	0.044
	[0.002]	[0.004]	[0.007]	[0.032]	[0.035]	[0.047]
skill int.-1	-0.052	0.293	0.088	0.263	-2.484	0.294
	[0.091]	[0.239]	[0.069]	[0.184]	[5.499]	[4.590]
scale int.-1	0	0.001	-0.002	-0.001	-0.003	-0.006
	[0.001]	[0.001]	[0.003]	[0.004]	[0.003]	[0.004]
interm.int.-1	0.274	2.931*	0.987	2.003	-1.061	-1.6
	[0.598]	[1.717]	[1.057]	[2.343]	[2.781]	[8.032]
agr.*agr.int.-1	0.841***	1.137***	0.403*	0.199	2.115***	2.496***
	[0.243]	[0.341]	[0.239]	[0.323]	[0.604]	[0.591]
pref*agr.*agr.int.-1	-0.176***	-0.094	-0.069	-0.081	-0.298***	-0.383***
	[0.052]	[0.072]	[0.053]	[0.092]	[0.113]	[0.129]
lab*lab.int.-1	-0.001	-0.001***	0	-0.002	-0.002	-0.005**
	[0.000]	[0.000]	[0.000]	[0.001]	[0.002]	[0.002]
pref*lab*lab.int.-1	0	0	0	-0.000*	0	0
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
skill*skill int.-1	-0.633	-0.48	-0.897*	-0.685	0.631	-3.819*
	[0.392]	[0.473]	[0.490]	[0.547]	[2.026]	[2.017]
pref*skill*skill int.-1	0.139	0.086	0.185*	0.132	0.021	0.803
	[0.085]	[0.099]	[0.106]	[0.115]	[0.649]	[0.538]
pref*mkt pot.-1	-0.104*	-0.028	-0.056	0.006	-0.05	-0.608
	[0.057]	[0.070]	[0.061]	[0.082]	[0.350]	[0.376]
scale*scale int.-1	0	0	0	0	0	-0.001
	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.001]
pref*scale*scale int.-1	0	0	0	0	0	0
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
mkt pot*interm	0.183***	0.220***	0.171***	0.194***	0.265***	0.274***
	[0.034]	[0.040]	[0.024]	[0.035]	[0.050]	[0.063]
pref*mkt pot*interm.-1	-0.048**	-0.136**	-0.071*	-0.101	-0.025	-0.017
	[0.022]	[0.062]	[0.039]	[0.086]	[0.087]	[0.252]
Constant	-1.713***	-35.598***	35.656	46.375**	-38.231	-35.925
	[0.570]	[9.499]	[0.000]	[21.553]	[0.000]	[23.185]
Observations	821	821	450	450	371	371
R-squared		0.3		0.33		0.38

Robust Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 19: Results-two-year averages-Preferential Margin

	ALL		BIG		SMALL	
	OLS	FE	OLS	FE	OLS	FE
mkt pot.-1	-0.006	0.952	-2.437*	-1.635	-2.547**	2.254
	[0.042]	[0.995]	[1.285]	[1.548]	[1.037]	[1.512]
arable land-1	-0.255**	-1.996***	-0.532	-0.501	-5.104**	-3.041
	[0.117]	[0.360]	[0.639]	[0.632]	[2.090]	[1.951]
lab.-1	0.075***	1.723***	-0.884*	-2.266*	4.759***	6.190***
	[0.024]	[0.481]	[0.473]	[1.213]	[1.372]	[1.322]
skill-1	0.072	-0.076	-0.009	-0.088	0.679	-17.546***
	[0.071]	[0.153]	[0.230]	[0.264]	[2.458]	[5.432]
agr.int.	0.036	0	-0.176	0	-1.086**	0
	[0.153]	[0.000]	[0.140]	[0.000]	[0.481]	[0.000]
lab.int.-1	0.004**	0.016***	0.015**	0.054*	-0.006	0.013
	[0.002]	[0.004]	[0.007]	[0.032]	[0.039]	[0.048]
skill int.-1	-0.135	0.088	0.032	0.21	-0.98	1.31
	[0.092]	[0.230]	[0.065]	[0.164]	[5.539]	[5.011]
scale int.-1	0	0.001	-0.004	0	-0.004	-0.006
	[0.001]	[0.001]	[0.003]	[0.004]	[0.003]	[0.004]
interm.int.-1	-1.027***	-1.126***	-0.996***	-0.819***	-1.959***	-2.423***
	[0.193]	[0.237]	[0.146]	[0.214]	[0.413]	[0.531]
agr.*agr.int.-1	-0.033	0.364	0.066	-0.591	0.563**	0.592
	[0.074]	[0.346]	[0.071]	[0.416]	[0.251]	[0.447]
marg*agr.*agr.int.-1	0.108***	0.101***	0.063**	0.092**	0.115**	0.154**
	[0.028]	[0.036]	[0.028]	[0.046]	[0.052]	[0.064]
lab*lab.int.-1	-0.000**	-0.001***	-0.001**	-0.003*	0.001	-0.001
	[0.000]	[0.000]	[0.000]	[0.002]	[0.003]	[0.003]
marg*lab*lab.int.-1	0	0	0.000*	0.000**	0	-0.000*
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
skill*skill int.-1	0.056	-0.008	0.028	-0.015	0.235	-0.263
	[0.042]	[0.081]	[0.043]	[0.057]	[1.717]	[1.540]
marg*skill*skill int.-1	-0.033	-0.025	-0.078	-0.061	0.091	-0.218
	[0.039]	[0.050]	[0.051]	[0.058]	[0.234]	[0.203]
marg*mkt pot.-1	0.028	0.023	0	-0.016	-0.016	0.217
	[0.036]	[0.047]	[0.041]	[0.056]	[0.159]	[0.145]
scale*scale int.-1	0	0	0.001	0	0.001	0.001
	[0.000]	[0.000]	[0.001]	[0.001]	[0.001]	[0.001]
marg*scale*scale int.-1	0	0	0	0	0	0
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
mkt pot*interm	0.169***	0.213***	0.162***	0.189***	0.261***	0.278***
	[0.034]	[0.040]	[0.025]	[0.035]	[0.049]	[0.060]
marg*mkt pot*interm.-1	-0.01	0.017	0.037	0.031	0.037	0.056
	[0.031]	[0.038]	[0.028]	[0.029]	[0.074]	[0.089]
Constant	-0.886	-29.685***	29.397**	50.337**	-43.692	-43.228**
	[0.000]	[9.004]	[14.687]	[25.389]	[0.000]	[20.793]
Observations	820	820	450	450	370	370
R-squared		0.3		0.33		0.39

Robust Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 20: Results-7 year averages-Preferential Tariff

	ALL		BIG		SMALL	
	OLS	FE	OLS	FE	OLS	FE
mkt pot.-1	3.225***	-8.830**	0.822	1.295	-14.100***	-1.55
	[0.723]	[3.506]	[0.887]	[0.889]	[4.275]	[6.076]
arable land-1	-1.378***	-7.790***	0	0	3.271	5.486
	[0.435]	[1.712]	[0.878]	[0.000]	[3.395]	[6.160]
lab.-1	0.298***	12.586***	1.016***	0	0	0
	[0.078]	[3.689]	[0.187]	[0.000]	[3.911]	[0.000]
skill-1	0.596*	0.591	1.603***	1.565**	25.642**	0
	[0.310]	[0.645]	[0.260]	[0.636]	[10.924]	[0.000]
agr.int.	0.022	0	-0.009	0	-2.354***	0
	[0.420]	[0.000]	[0.383]	[0.000]	[0.838]	[0.000]
lab.int.-1	0.008	0.011	0.021	0	0.011	-0.056
	[0.005]	[0.014]	[0.017]	[0.089]	[0.094]	[0.225]
skill int.-1	-0.495	-0.49	0.078	0.601	71.542**	51.988
	[0.336]	[1.118]	[0.213]	[1.007]	[27.437]	[48.223]
scale int.	0.001	0.005	-0.001	0.013*	-0.003	-0.017
	[0.002]	[0.006]	[0.006]	[0.007]	[0.008]	[0.041]
interm. int.-1	2.109	8.229	2.72	4.379	-5.493	-5.675
	[1.538]	[5.485]	[2.142]	[6.936]	[7.581]	[29.453]
agr.*agr.int.-1	3.106***	3.380***	2.119***	1.097	2.58	4.633**
	[0.727]	[0.760]	[0.512]	[0.726]	[1.662]	[1.976]
pref*agr.*agr.int.-1	-0.635***	-0.577***	-0.440***	-0.795*	-0.234	-0.835*
	[0.164]	[0.206]	[0.123]	[0.448]	[0.338]	[0.428]
lab*lab.int.-1	-0.002**	0.001	0	0.001	-0.005	0.003
	[0.001]	[0.001]	[0.001]	[0.004]	[0.004]	[0.008]
pref*lab*lab.int.-1	0	0	0	0	0.001	0
	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.002]
skill*skill int.-1	-6.181***	-1.916	-3.511***	-2.96	-0.121	1.367
	[1.176]	[1.696]	[1.088]	[2.021]	[5.186]	[8.059]
pref*skill*skill int.-1	1.349***	0.439	0.733***	0.591	-4.485**	-3.581
	[0.251]	[0.305]	[0.227]	[0.372]	[1.977]	[3.738]
pref*mkt pot.-1	-0.618***	0.172	-0.256*	-0.071	2.689**	2.188
	[0.155]	[0.238]	[0.142]	[0.232]	[1.110]	[2.503]
scale*scale int.-1	0	0	0	0	0.002	0.001
	[0.001]	[0.001]	[0.001]	[0.001]	[0.003]	[0.007]
pref*scale*scale int.-1	0	0	0	0	0	0
	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.001]
mkt pot*interm	0.273***	0.322***	0.260***	0.348***	0.392***	0.304**
	[0.054]	[0.075]	[0.063]	[0.094]	[0.084]	[0.112]
pref*mkt pot*interm.-1	-0.129**	-0.358*	-0.150*	-0.214	0.073	0.063
	[0.053]	[0.193]	[0.083]	[0.267]	[0.239]	[0.905]
Constant	-5.747***	-135.786***	-19.441	-9.628**	-83.778	-72.098
	[1.721]	[37.193]	[0.000]	[4.746]	[0.000]	[81.279]
Observations	209	209	106	106	103	103
R-squared		0.81		0.86		0.82

Robust Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 21: Results-7 year averages-Preferential Margin

	ALL		BIG		SMALL	
	OLS	FE	OLS	FE	OLS	FE
mkt pot.-1	0.038	-10.141***	-0.291	0.815	-1.416	-4.188
	[0.135]	[3.539]	[1.473]	[1.253]	[4.388]	[16.001]
arable land-1	-0.914**	-6.719***	0	0	4.802	-2.191
	[0.405]	[1.724]	[1.343]	[0.000]	[5.773]	[9.349]
lab.-1	0.273***	11.043***	1.135***	0	0	0
	[0.079]	[3.518]	[0.264]	[0.000]	[6.807]	[0.000]
skill-1	0.32	0.972*	1.421***	1.557***	30.353*	0
	[0.323]	[0.557]	[0.474]	[0.557]	[17.945]	[0.000]
agr.int.	0.254	0	-0.421	0	-1.595*	0
	[0.386]	[0.000]	[0.307]	[0.000]	[0.805]	[0.000]
lab.int.-1	0.008*	0.017	0.045***	0.055	0.07	-0.387
	[0.005]	[0.017]	[0.017]	[0.077]	[0.170]	[0.369]
skill int.-1	-0.680**	-0.316	-0.011	0.824	87.409**	1.122
	[0.318]	[0.855]	[0.196]	[0.869]	[43.711]	[66.504]
scale int.	0.001	0.007	-0.008	0.018	-0.003	-0.096
	[0.002]	[0.007]	[0.009]	[0.012]	[0.014]	[0.331]
interm. int.-1	-1.435***	-2.325***	-1.503***	-1.470**	-2.817***	-5.083**
	[0.320]	[0.612]	[0.377]	[0.553]	[0.947]	[1.995]
agr.*agr.int.-1	-0.106	0.133	0.146	-2.558	0.998**	0.389
	[0.206]	[0.727]	[0.165]	[2.137]	[0.429]	[1.079]
marg*agr.*agr.int.-1	0.255***	0.304**	0.254***	0.419*	0.164	0.246
	[0.095]	[0.116]	[0.081]	[0.221]	[0.159]	[0.215]
lab*lab.int.-1	0	-0.001	-0.003***	-0.003	-0.005	0.028
	[0.000]	[0.001]	[0.001]	[0.004]	[0.012]	[0.026]
marg*lab*lab.int.-1	-0.000*	0	0.000***	0.000*	0	-0.001
	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.001]
skill*skill int.-1	0.411***	0.166	0.113	-0.112	-26.602*	-0.263
	[0.108]	[0.236]	[0.092]	[0.226]	[13.402]	[20.382]
marg*skill*skill int.-1	-0.453***	-0.18	-0.305**	-0.275	1.970*	-0.259
	[0.079]	[0.117]	[0.128]	[0.167]	[1.040]	[1.710]
marg*mkt pot.-1	0.270***	0.189	0.02	-0.042	-1.103	0.41
	[0.077]	[0.164]	[0.123]	[0.167]	[0.674]	[1.259]
scale*scale int.-1	0	-0.001	0.002	-0.003	0	0.016
	[0.000]	[0.001]	[0.002]	[0.002]	[0.002]	[0.055]
marg*scale*scale int.-1	0	0	0	0	0	-0.001
	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.004]
mkt pot*interm	0.251***	0.301***	0.258***	0.343***	0.385***	0.285**
	[0.054]	[0.066]	[0.061]	[0.085]	[0.080]	[0.133]
marg*mkt pot*interm.-1	-0.08	0.002	0.084	0.121	-0.054	0.162
	[0.091]	[0.102]	[0.063]	[0.086]	[0.204]	[0.235]
Constant	-4.331**	-101.774***	-21.668	-9.009	-100.814	31.352
	[1.699]	[32.978]	[0.000]	[6.305]	[0.000]	[124.687]
Observations	209	209	106	106	103	103
R-squared		0.81		0.87		0.83

Robust Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%