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THE DETERMINANTS OF REGIONAL EXCHANGE IN MERCOSUR: GEOGRAPHY AND TRADE LIBERALIZATION

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Abstract

Since the mid-eighties many Latin American countries have been involved in a process of trade liberalization. The direct consequence of this liberalization was a strong increase in international trade flows between these countries and the rest of the world. This raise in the overall level of international trade has also been accompanied by an even stronger increase in regional exchange of goods and services .

What explains these upsurge in trade flows among Latin America countries? What role have played commercial policies in this phenomenon? . In particular, have unilateral -non preferential- trade liberalization schemes played an important role in this phenomenon?. What about the effect of sub-regional liberalizations schemes that became popular in the 1990s ? . How important is geography (distance) and "neighborhood" in explaining this increase in regional trade?

The purpose of this paper is to address these questions, concentrating our attention on the countries belonging to MERCOSUR. Both the theoretical analysis and the empirical evidence suggest that unilateral trade liberalization couple with geography has been an important factor at work. Mercosur itself -with its tariff preferences- was also an element that contributed to raise trade within the area; nevertheless, its quantitative importance is reduced once we control for the other variables.

Mercosur, Geography, Trade Integration.

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1. Introduction.

Since the mid-eighties many Latin American countries have been involved in a process of trade liberalization[2]. In some cases, the tariff reduction has been quite impressive (see table 1). The obvious consequence of this liberalization was a strong increase in international trade flows between these countries and the rest of the world . This raise in the overall level of international trade has also been accompanied by an even stronger increase in regional exchange of goods and services . For example, in the case of ALADI countries, the rate of change in regional trade between 1987 and 1992 surpasses that corresponding to total trade (see table 2). As a consequence, since 1987, these economies experienced an increase in their share of regional exports and imports on total exports and imports; it rose from 12% in 1987 to 16.5% in 1992.

What explains these upsurge in trade flows among Latin America countries? What role have played commercial policies in this phenomenon? . In particular, have unilateral- non preferential--trade liberalization schemes anything to do with this phenomena?. What about the effect of sub-regional liberalizations schemes that became popular in the 1990s ? . How important is geography (distance) and "neighborhood" in explaining this increase in regional trade.

The purpose of this paper is to address these questions, concentrating our attention on the countries belonging to MERCOSUR. In particular, we provided some evidence supporting the fact that the important increase in trade flows among Mercosur countries is driven by the exploitation of comparative advantages couple with geographical proximity. Both factors have been encouraged by the unilateral trade liberalization reforms pursued by each nation. The effect of preferential reduction in tariffs

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[2]For a throughout analysis of trade reform in Latin America in the last decade see Edwards (1994).

has also spurred trade among the four economies. Nevertheless, its contribution is far less important once appropriate control is taken for geography and unilateral liberalization policies.

The rest of the paper is organized as follows . Section 2 starts with a brief description of the commercial policies followed by Mercosur countries and the evolution of trade flows within the area. Section 3 presents an analytical framework that allows us to study the effects of unilateral trade policies on regional trade. Using a model originally developed by Krugman (1980) and later on modified by Stein and Frankel (1994), we show that in the presence of transport costs (interpreted in a broad sense), regional trade will be enhanced by a unilateral (non-discriminatory) trade liberalization. On top of that preferential arrangements have to be considered in order to evaluate the overall effect of commercial policy on regional trade. The model also serves to derive the effect of distance (geography) on trade flows. We show that geography is another factor that encourages the exchange of products among neighboring countries.

These hypothesis are empirically investigated in section 4. We estimate bilateral-trade gravity equations using data on trade flows for the four countries belonging to Mercosur: Argentina, Brazil, Paraguay and Uruguay. The results of the estimations show that distance is an important determinant of bilateral trade conducted by each of the countries considered. Interestingly , this effect is much stronger once appropriate control is taken for unilateral trade liberalization, confirming the intuition that this policy further encourages the effect of geography on regional exchange of goods. The empirical analysis also suggest that preferential trade arrangements like Mercosur have a positive effect on regional trade, though its relevance is reduced considerably once we account for geography and unilateral trade liberalization. Section 5 concludes with some summary remarks.

2. Trade Policies and the behavior of regional trade in Mercosur.

Mercosur was created by the Asuncion treaty signed by Argentina, Brazil, Paraguay and Uruguay in March of 1991. The treaty established the formation of a Trade Union among the four countries, starting in January 1995. Trade within the region is subject to zero tariff while imports from the rest of the world pay a common external tariff (CET) that varies from 0 to a maximum of 20%. The 100% preference for intraregional trade was obtained through a mechanism of automatic tariff cuts (applied at 6-months intervals) starting in March 1991 and ending in December 1994. Also, the CET, negotiated in the second semester of 1994, was put into operation, as scheduled, at the beginning of 1995 (table 3 presents the structure of the CET)[3].

Though some exceptions to the CET and to the zero tariff for intraregional trade were established, their importance is of second order --they amount to 300 items out of the 8000 tariff positions that were negotiated--. In any case these exceptions are scheduled to disappear in a period of five to six years.

But, trade liberalization in the region was not only accomplish through "regionalism" . Previously to the establishment of Mercosur there were important efforts in some countries to unilaterally reduce the barriers to trade (both tariffs and non-tariffs). In the case of Argentina, trade liberalization started in 1988 and were push forward by the new administration since 1989. The average tariff was reduced from a level of 45% in 1987 to 9% in 1994 (see table 4)[4]. Also most non-tariff barriers were eliminated.

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[3]For more details on the CET see Garriga and Sanguinetti (1995).

[4]Nevertheless, the unilateral trade liberalization policy suffer a "temporary"set back in October of 1992 when a 10% tax ("tasa de estadistica") was imposed on all imports. This tax was then reduced considerably at the beginning of 1995 with the implementation of the CET in Mercosur. For details about the

A similar process occurred in Brazil where tariff on imports were reduced from 31% in 1990 to 13.6% in 1994 (see table 5).

This process of liberalization has implied an important increase in the foreign trade conducted by these countries. For example, in the case of Argentina, the total exchange of goods with the rest of the world rose more than three times between 1987 and 1994 (see table 6). A similar process is also observed in Brazil (see table 7). Nevertheless, this rise in external trade has not been uniform across all destination: the exchange with neighboring countries has received a strong impulse. As table 6 shows, in the case of Argentina, the trade share corresponding to Mercosur countries rose from 15% (it was just 11% in 1985) in 1987 to 26% in 1994. For the case of Brazil this share was 6% in 1987 and rises to 14% in 1994. Taking the four countries of Mercosur together, while in 1988 the share of regional trade on total trade was 7.2% , it rose to 23.5% in 1994 (see table 8). What explains this surge in regional trade within Mercosur countries? Of course, the implementation of tariff preferences within the area since 1991 was bound to have consequences on trade flows. As table 9 shows between 1990 and 1994, the exchange of goods in Mercosur grew almost three times. Nevertheless, the adoption of trade preferences within the region does not seem to be the only force at work. Chile, a country not belonging to Mercosur (as yet), also experienced an important increase in its exchange with its neighbors. Its trade share corresponding to Mercosur rose from 11 in 1985 to 15% in 1994 (if exports are only considered the share goes from 8% in 1985 to 12% in 1994, see table 10). But, if regional preferences are not enough to explain this phenomena, what other forces may have been important in explaining the surge in regional trade? Geography is a factor that have been singled out as being an important determinant of trade flows. In the next section we present a model where unilateral trade liberalization

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recent evolution of the commercial policy in Argentina see Berlinsky (1994).

policies couple with the existence of transports costs may imply a rise in regional trade. This hypothesis is then empirically investigated using econometrics techniques in section 4.

3. The effect of Unilateral trade liberalization on regional trade in the presence of transportation costs: a simple model.

In this section we present a simple model that will help to study the effects of trade policy and of geography on trade flows. We based our analysis on a model developed by Stein and Frankel (1994) and Frankel et al (1993). These authors, in turn, extend a model, originally developed by Krugman (1980), to study the determinants of the bilateral volume of trade, and the world welfare implications of different trade agreements, specially the formation of trading blocks. The emphasis of our analysis will be somehow different. We depart from analyzing the optimality of trading blocks, and instead we concentrate our attention on the consequences for regional trade of unilateral trade liberalization in the presence of transportation costs.

In the tradition of the "new trade theory" (i.e. Krugman (1980), (1986) (1990)) the model assumes a non-competitive market structure with consumers that have preferences for variety. Formally, the utility of the representative consumer is given by,

$$U=\sum_i c_i^{\theta} \quad ; \quad 0\leq\theta\leq 1 \qquad (1)$$

where ci is the consumption of the i variety and θ is a parameter that takes values between zero and one. As it is clear from (1) welfare is positively associated with the amount of potential varieties the individual can access to. The higher the

value of the parameter θ, the lower the preference for variety.[5]

On the production side we assume that labor is the only factor of production. Increasing returns are introduced assuming that there is a fixed cost and a constant marginal cost of producing each variety. The (inverse) production function common to all varieties is then[6],

$$l_i=\alpha+\beta x_i \qquad \alpha,\beta\geq 0 \qquad i=1,..,n \qquad (2)$$

where li is the quantity of labor used in producing the i variety and xi is the quantity produced of that variety. We assume a non competitive, monopolistic competition scenario where there are as many firms as varieties. Thus, each firms set the price for its variety so as to maximize its benefits. Nevertheless, free access to the markets of goods (developing new varieties) will make benefits go to zero.

We are interested in the open economy version of this model where individuals can consume varieties produced elsewhere. For simplification we are going to assume a world economy composed of three countries: D ("domestic"), R ("regional") and NR ("non-regional"). We assume tastes and technologies, as described by equations (1) and (2), are the same in all economies as well as the size of their population L[7]. Thus, gains from trade arise only from increase in variety consumption[8]. With the purpose of introducing differences in transports costs, we assume that two of the three countries (D and R) are located nearby and the third (NR) is located far away. This hypothetical configuration helps to define

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[5]In the limit if θ =1 there is perfect substitution among varieties which means, from the point of view of consumer taste, that all varieties are identical.

[6]The total cost function is TC=Wα+Wβxi, where W denotes nominal wages.

[7]Later on we relax this assumption.

[8]Thus we left aside factor endowments considerations as a source of trade between nations.

--from the point of view of the countries that we put together-- two types of foreign goods. A first type, called regional good (variety), comes from the country located in the neighborhood. The second type of good (variety), called extra-regional, comes from the country located outside the region. The relevant thing here is that the transport cost is lower for the goods (varieties) coming from a country within the region compare to that corresponding to a good coming from the country out of the region. Then, if the producer price for a good i coming from country R is P^*_{ri} and that corresponding to a variety coming from out of the region is P^*_{nri}, then the prices that a domestic consumer located in country D will have to pay for each type of foreign good are,

$$P_{ri}=P^*_{ri}(1+t+a) \quad ; \quad P_{nri}=P^*_{nri}(1+t+b) \quad ; \quad b>a \qquad (3)$$

The letter t stands for the exogenous level of the import tariff which is assumed to be uniform across countries (no preferential arrangement among regional countries are assumed at this point), and a and b stand for transportation costs corresponding to regional and no regional goods respectively. Notice two things: first we have chosen a simple way of capturing transport costs. They are introduced as a % increase in the producer (FOB) value. Here we made a slight departure from related literature (see Krugman (1980) and Stein and Frankel (1994)) where iceberg-type transports cost are postulated[9]. Secondly, and perhaps more important, we assume tariffs are imposed on the FOB price

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[9]Our specification is simpler and it does not imply that the CIF price of the imported good rises more than proportionally with distance. The iceberg-type transport cost specification have the following form: p = p/(1-a) or p= p + p a /(1-a) where the last term in the second expression indicates the transport cost that have to be incurred when importing a good of value equal to p. It is easy to see that $\partial^2(pa/(1-a)) / \partial a^2 \geq 0$.

(excluding transport and insurance costs) of the imported goods.[10] This is a key assumption that will drive some of the results we derive below so some clarifications are needed. Transport cost are interpreted in a broad sense, encompassing not only physical transportation of goods, but also costs of communications and of general information regarding the other country institutions and habits. When transports costs are interpreted in this general way --we can renamed then as costs of doing international transaction-- it is clear that tariffs are not levied on this items. Alternatively, even if transport costs were understood as representing only physical costs, the common practice in international trade operations followed by some countries do not contradict the assumption that tariffs are charged on the FOB price[11].

The consumer problem faced by the representative individual situated in country D in a context of an open economy (people can purchase domestic and foreign varieties) can then be expressed in the following way,

$$\max U = \sum_{i=1}^{D+R+NR} c_i^{\theta} \qquad (4)$$

s.t.

$$\sum_{i=1}^{D} c_i p_{di} + \sum_{i=D+1}^{D+R} c_i p_{ri} + \sum_{i=D+R+1}^{D+R+NR} c_i p_{nri} \leq W+T$$

where domestic varieties are indexed between 1 and D, regional varieties between D+1 and R and non-regional goods are indexed

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[10] Stein and Frankel (1994) also make this assumption. An alternative case is presented in Frankel et al. (1993).

[11] USA and Mexico, for example, follow this convention. On the other hand, in Argentina tariffs are charged on the CIF price of the imported good.

between D+R+1 and D+R+NR. W stands for wages and T is the lump-sum transfer received by the consumer from the government. It , represents the way the authorities spend the revenues collected through tariffs.

The first order conditions gives raise to the following inverse demand equations,

$$p_{di}=\frac{\theta c_{di}^{\theta-1}}{\lambda} \quad ; \quad p_{ri}=\frac{\theta c_{ri}^{\theta-1}}{\lambda} \quad ; \quad p_{nri}=\frac{\theta c_{nri}^{\theta-1}}{\lambda} \qquad (5)$$

Using (5) it is easy to show that the elasticity of demand for each type of good (domestic, regional and non regional) is the same,

$$\epsilon_{ji}=\frac{\partial c_{ji}}{\partial p_{ji}}\frac{p_{ji}}{c_{ji}}=\frac{1}{1-\theta} \qquad j=d,r,nr \qquad (6)$$

In each country, a firm producing the variety i chooses the level of production so as to maximize profits,

$$\Pi_i=p_i x_i-(\alpha+\beta x_i)W \qquad (7)$$

Now, market clearing for each variety implies,

$$x_i=(c_{di}+c_{ri}+c_{nri})L \qquad (8)$$

where here we make use of the assumption that all countries are equal in size. Using (7) and (8), the first order condition for profits maximization yields,

$$(c_{di}+c_{ri}+c_{ri})+p_i\left(\frac{\partial c_{di}}{\partial p_i}+\frac{\partial c_{ri}}{\partial p_i}+\frac{\partial c_{nri}}{\partial p_i}\right)-\beta W\left(\frac{\partial c_{di}}{\partial p_i}+\frac{\partial c_{ri}}{\partial p_i}+\frac{\partial c_{nri}}{\partial p_i}\right)=0 \qquad (9)$$

Replacing (6) in (9) we arrive at the profit maximization price of variety i,

$$p_i=\frac{\beta W}{\theta} \qquad (10)$$

or, assuming the nominal wage is the numeraire of the economy, we have,

$$\hat{p}_i = \frac{p_i}{W} = \frac{\beta}{\theta} \qquad (10')$$

condition (10') assures that producer prices, in terms of wages, will be equal for all varieties , independently where the good is produced. In other words, FOB prices will be equal across countries ($\hat{P}_{di}=\hat{P}^*_{ri}=\hat{P}^*_{nri}$ $\forall i$). Assuming free entry so that profit are zero, it is found that the quantity of each variety is also the same whether the variety is produced locally or abroad,

$$x_i = \frac{\alpha\theta}{\beta(1-\theta)} \qquad (11)$$

Moreover, assuming full employment of the labor force ($L=\Sigma li$) and using (11) the number of varieties produced in each country depends upon the size of its labor force: $n=L(1-\theta)/\alpha$. As we assumed countries are of equal size, then the number of varieties produced in each country will also be the same[12].

From the first order condition corresponding to the consumer problem we can derive the relative demands (we eliminate subscript i for simplification),

$$\gamma_{r,d} = \frac{c_r}{c_d} = \frac{1}{(1+t+a)^{\frac{1}{1-\theta}}} \quad ; \quad \gamma_{nr,d} = \frac{c_{nr}}{c_d} = \frac{1}{(1+t+b)^{\frac{1}{1-\theta}}} \quad ; \quad \gamma_{nr,r} = \frac{c_{nr}}{c_r} = \frac{(1+t+a)^{\frac{1}{1-\theta}}}{(1+t+b)^{\frac{1}{1-\theta}}}$$

It is easy to see that relative demands of foreign goods (regional and non regional) will negatively depend on transportation costs and tariffs. What is perhaps less obvious is that relative demand of non regional goods in term of regional goods will be positively associated with the level of tariffs,

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[12]Thus the introduction of increasing returns have no effect on prices but on the amount of varieties produced in equilibrium by each country. If we identify variety with quality, the increasing return assumption implies that larger countries can produce better quality product at the same price.

$$\frac{\partial \gamma_{nr,r}}{\partial t} = \frac{1}{1-\theta} \left(\frac{(1+t+a)}{(1+t+b)} \right)^{\frac{\theta}{1-\theta}} \frac{b-a}{(1+t+b)^2} \geq 0 \qquad (13)$$

Then (13) establishes that a reduction in the tariff rate will reduce demand for extra-regional goods relative to regional ones. The intuition of this result is clear. A lower tariff raises the importance of the transportation costs differential (between regional and non regional goods) relative to the final price of the imported goods, thus increasing the relative price of goods coming from far away countries. Using (13), and recalling we are dealing with a world of three countries, we can find an expression for the share of regional imports on total imports,

$$S_r = [1+\gamma_{nr,r}]^{-1} \qquad (14)$$

and it is easy to show that,

$$\frac{\partial S_r}{\partial t} = -[1+\gamma_{nr,r}]^{-2} \frac{\partial \gamma_{nr,r}}{\partial t} \leq 0 \qquad (15)$$

Unilateral trade liberalization will then increase the share of regional imports on total imports. In other words, under the stated assumptions about transportation costs, non discriminatory trade policies will also have consequences on regional trade.

The effect of trade policies on regional trade can also be studied by analyzing the determinants of bilateral trade between pairs of countries. Given the assumption of symmetry, the bilateral volume of trade (BVT) will be twice the flow of goods in one direction. Thus, given our three country world configuration, we will have two (distinct) bilateral trade equations,

$$BTV_{d,r} = 2 \left(\frac{\gamma_{r,d}}{1+\gamma_{r,d}+\gamma_{nr,d}} \right) GDP \qquad (16a)$$

$$BTV_{d,nr} = 2 \left(\frac{\gamma_{nr,d}}{1+\gamma_{r,d}+\gamma_{nr,d}} \right) GDP \qquad (16b)$$

where $BVT_{d,r}$ correspond to bilateral trade between countries

belonging to the same region and $BVT_{d,nr}$ does the same but for countries that do not belong to the same area. Plugging (12) in (16a) and (16b) it is easy to show that[13],

$$\frac{\partial BVT_{d,r}}{\partial t} \leq 0 \quad ; \quad \frac{\partial BVT_{d,r}}{\partial a} \leq 0 \quad ; \quad \frac{\partial BVT_{d,nr}}{\partial t} \leq 0 \quad ; \quad \frac{\partial BVT_{d,nr}}{\partial b} \leq 0 \qquad (17)$$

In other words, the increase in the barriers to trade, either policy induced or of natural type (distance), will obviously have negative effects on bilateral trade flows between any pair of countries. What is perhaps less obvious, and constitutes an interesting implication of the model, is the sign of the cross derivatives,

$$\frac{\partial BVT_{d,r}}{\partial a \partial t} \geq 0 \quad ; \quad \frac{\partial BVT_{d,nr}}{\partial b \partial t} \geq 0 \quad ; \qquad (18)$$

Both expressions have positive signs implying that the negative effect of transport cost on trade will be less important the

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[13] An alternative exercise is to evaluate the effect on bilateral exchange of a preferential trade arrangement, i.e. the implementation of a regional trade liberalization. For example, let assume countries R and D decides to reduce their tariff on a bilateral basis while the tariff level with the NR country stays constant. In this case we can still use equation (16) to evaluate the response of trade if we assume that relative price effects (i.e. term of trade effect) are absent (see Stein (1994) for the more general case were relative prices change). This will be the case if, for example, we assume that the third country is very large compare to the two regional countries (the NR country is the "world economy"). Then the reduction in tariff between the two regional countries will imply only a small increase in the quantity demanded of D and NR goods relative to total demand (trade diversion will be small). As a consequence, FOB prices will also change very little. Under the stated assumptions is then easy to show that regional (bilateral) liberalization will of course increase trade between the two regional countries and that this raise in the exchange will be greater than the one obtained through a unilateral trade liberalization. Formally, $|\partial BVT_{r,d}/\partial t_{unil}| \leq |\partial BVT_{r,d}/\partial t_{bil}|$.

higher is the tariff level. Thus, in the presence of very protectionist policies, geography will not be an important determinant of trade flows.

Besides transport costs and trade policies, income is another important determinant of bilateral trade given that this variable determines total demand of goods in each country. For the symmetric case equations (16) indicate that the BVT is positively associated with (twice) the level of total income . If we now assume that countries can be different in size (different Ls) we arrive at the following expressions for the BVTs[14],

$$BVT_{d,r}=GDP_r GDP_d\left[\left(\frac{\gamma_{r,d}}{(L_d+L_r\gamma_{r,d}+L_{nr}\gamma_{nr,d}}\right)+\left(\frac{\gamma_{r,d}}{(L_r+L_d\gamma_{r,d}+L_{nr}\gamma_{nr,d}}\right)\right] \quad (19a)$$

$$BVT_{d,nr}=GDP_d GDP_{nr}\left[\left(\frac{\gamma_{nr,d}}{(L_d+L_r\gamma_{r,d}+L_{nr}\gamma_{nr,d}}\right)+\left(\frac{\gamma_{nr,d}}{(L_{nr}+L_d\gamma_{nr,d}+L_r\gamma_{r,nr}}\right)\right] \quad (19b)$$

Thus, in the more general case of countries of different size, the volume of bilateral trade depends positively on the product of the

[14]As the emphasis of the analysis is on the effect of nondiscriminatory trade policy, we don't have to worry about the effect of changes in relative prices (terms of trade effects) when we allow for differences in size.

countries' GDP, besides tariffs and transport costs[15]. In the next section we investigate the empirical relevance of equations (19) using the gravitational model.

4. Explaining bilateral trade in Mercosur: The gravitational equation.

In this section we want to empirically study the determinants of bilateral trade for the case of countries belonging to Mercosur. In particular, we would try to identify the contribution of trade policies--both regional and unilateral-- and of geography in the behavior of trade flows.

The gravitational model is an empirical construction which has been used extensively to study the determinants of bilateral trade. Similar to the formula used in physic to describe the attraction between two objects, the basic gravitational model postulates that trade flows between two countries is associated positively with the product of the countries GDPs and inversely with the distance between them. Though the model has been relatively successful in explaining bilateral trade flows, it has been criticized for its lack of microeconomic foundations. Some authors have tried to tackle this problem. For example, Andersen (1979), Bergstrand (1985), Leamer (1992) and Losada (1994) have provided theoretical models where the gravitational equation is derived within a context

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[15] It is easy to see that when tariffs are zero and there is no transportation costs the bilateral trade equations (19a) and (19b) are transformed into,

$$BVT_{d,r}=\frac{2GDP_dGDP_r}{GDP_w}$$

$$BVT_{d,nr}=\frac{2GDP_dGDP_{nr}}{GDP_w}$$

Where GDP_w indicates the GDP of the world. This expression is similar to the one found in Stein (1994).

of perfect competition and constant return to scale production functions. On the other hand, the model presented in the last section, which follows closely the work of Stein and Frankel (1994) and Frankel et al (1993), offers an alternative microfoundation of the gravity equation postulating a world economy subject to increasing returns and imperfect competition.

In any case the gravity equation represents an easy way of capturing the effects of geography on trade flows. It can also be extended, as we did in the last section, to incorporate the effects of trade policies.

The basic gravity equation model has the following form,

$$T_{ij}=\beta_o \frac{(GDP_i GDP_j)^{\beta_1}}{Dist_{ij}^{\beta_2}} \qquad (20)$$

where T_{ij} measures bilateral trade between countries i and j and $Dist_{ij}$ stands for distance between the two countries. Taking logs we arrive at,

$$\ln T_{ij}=\ln\beta_0+\beta_1 \ln(GDP_i GDP_j)-\beta_2 \ln Dist \qquad (21)$$

Equation (21) constitutes the basic gravity equation. Table 11 presents the results of the regression analysis. The estimation of equation (21) is presented in column R1. R2 adds a dummy variable to control for adjacency (takes a value of 1 in the case of countries with common borders) which, together with distant, helps to fully characterize the relative proximity between pairs of countries. The R3 regression incorporates, as another explanatory variable, the product of the countries' trade share in GDP. The aim is to capture the unilateral trade policies followed by the involved nations. Finally in R4 we add a Mercosur Dummy to evaluate the effect of the preferential tariff reductions implemented since 1991. We run the regressions for two selected years: 1987 and 1992. The dependent variables is bilateral trade flows between each Mercosur country and the rest of the world. All variables are in natural logs.

Starting with the results corresponding to 1992 (the last year for which we have information) we see that geography (distance) was an important determinant of bilateral trade for the Mercosur countries. Both distance and the dummy variable adjacency have the expected sign and are significant at 1% level. A similar result is obtained for the openness variable. The estimated coefficient for of this variable is, as expected , positive and significant. This is, of course, not surprising since if two countries' trade with the rest of the world raises , it is also probably that they will trade more with each other. What is less obvious is that the introduction of this variable in the regression raises the significance and the elasticity (response) of bilateral trade with respect to distance. That is, as we conjecture in the theoretical analysis of the last section, geography becomes a stronger determinant of (bilateral) trade once appropriate control is taken of the degree of unilateral openness of the economy.

The Mercosur dummy has the expected sign and it is significative. It is interesting to note that this happens even though this variable is closely correlated with Adjacency [16]. We conclude then that tariff preferences within Mercosur has had an independent and positive effect on regional trade. Nevertheless it is also clear that once geography and unilateral trade policies are taken into account, the effect of tariff preferences on bilateral trade is greatly moderated. These tariff preferences mean, on average, an increase in bilateral trade of only half percent point compare to the case were no control is taken for the existence of Mercosur.

We re-estimate all the regressions using data corresponding to 1987. The purpose of this exercise is to compare the results with those found for 1992. We chose 1987 because there are important aspects regarding trade policy that are different with respect to

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[16]Actually out of 19 observations corresponding to adjacency, 10 are in common with the Mercosur variable.

the trade policy present in 1992. First, Mercosur was not in place in 1987[17]. Second, unilateral trade liberalization --at least for the cases of Argentina and Brazil-- were not yet fully implemented in the region. The regressions results show that distance is still an important factor behind bilateral trade, though its relative importance seem to be somehow reduced compare to 1992: the adjacency variable is not significant in 1987. This result is consistent with the theoretical model presented in section 3 where higher tariffs reduced the importance of geography as a determinant of bilateral trade. In addition, the Mercosur dummy has no significant effect on trade in 1987, further confirming that at that time geography was not an important determinant of trade flows as it was in 1992.

5. Concluding remarks.

Latin America experience with trade liberalization since mid-eighties has been accompanied by a strong increase in regional exchange of goods and services. This phenomenon was particularly important for the countries belonging to Mercosur. Throughout the paper we have tried to identify the reasons behind this phenomenon; both the theoretical analysis and the empirical evidence suggest that unilateral trade liberalization couple with geography has been an important factor at work. Mercosur itself -with its tariff preferences- was also an element that contributed to raise trade within the area; nevertheless its quantitative importance is reduced once we control for the other variables.

The above findings are consistent with the idea that Mercosur constitutes a "Natural Block" (see Krugman (1991)(1992))[18]. Common borders, same cultural heritage, similar languages, etc., makes

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[17]Nevertheless some timid trade negotiations were being negotiated with Brazil on a sectoral basis.

[18]For an application of the concept of Natural Block to the case of Mercosur see Garriga and Sanguinetti (1994).

the cost of doing transactions among these countries low compare to extra-regional exchanges, and this will stimulate intra-regional trade. This evidence in favor of a "natural" association among Mercosur economies has a direct implication regarding the potential gains and costs of pursuing a trade integration scheme. In particular, under this scenario, tariff preferences would imply lower costs in terms of trade diversion.

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Table 1

Latin America Trade Liberalization: Tariff Indicators

Country	Starting year	Maximum Tariff		Number of Tariffs (levels)		Average Tariff	
		at the Beginning	at the end of 1993	Initially	at the end of 1993	Initially	at the end of 1993
Argentina*	1989	65	30		3	39***	15***
Brazil	1988	105	35	29	7	51**	14**
Colombia	1990	100	20	14	4	44***	12***
Chile	1973	220	10	57	1	94**	10**
	1985	35	11	1	1	35**	11**
México	1985	100	20	10	3	24*	12*

Source: E.C.L.A.C, 1994

* tariff rate includes others duties charged on imports

** simple average

*** weighted on imports

Table 2

Latin America Integration Association (LAIA)
Total Trade (Exports + Imports) - 1987 / 1992
(Millions of US$)

Country	From and Towards the WORLD			From and Towards LAIA			Share % (*)	
	1987	1992	Increase %	1987	1992	Increase %	1987	1992
Argentina	12,179	27,106	122.6	3,039	8,899	192.9	24.9	32.8
Bolivia	1,334	1,896	42.1	762	698	-8.4	57.1	36.8
Brasil	41,277	59,331	43.7	4,753	11,467	141.2	11.5	19.3
Colombia	13,252	13,270	0.1	1,426	2,766	93.9	10.8	20.8
Chile	9,125	19,377	112.3	1,785	4,015	124.9	19.6	20.7
Ecuador	4,250	5,543	30.4	716	894	24.9	16.8	16.1
México	32,879	75,291	129.0	1,079	3,387	213.9	3.3	4 5
Paraguay	946	2,079	119.8	422	910	115.5	44.7	43.8
Perú	5,795	6,685	15.4	1,001	1,786	78.4	17.3	26.7
Uruguay	2,332	3,630	55.7	914	1,605	75.5	39.2	44.2
Venezuela	18,816	26,087	38.6	1,407	2,843	102.0	7.5	10.9
Total	**142,186**	**240,295**	**69.0**	**17,105**	**39,270**	**129.6**	**12**	**16.3**

Source: Based on Intal Data, and Integración Latinoamericana Nº 139, p.69 a 71; 200 p.62 a 63.
(*) Regional Trade on Total Trade

Table 3
Common External Tariff

Tariff	Number of Positions	Frequency %
0	90	1,1
2	1326	16021
4	204	2,49
6	250	2,06
8	244	2,98
10	763	9,33
12	806	9,85
14	2122	25,94
16	810	9,9
18	900	11
20	666	8,14
Total	8181	100
Average Tariff		12,5
Standard Deviation		5,7
Minimum		0
Maximum		20

Table 4

ARGENTINA
Tariff Reform (1988-1994)
(in percentage)

	1987	1988	1989		1990							1991					1992	1993	1994
		oct.	oct.	dec	Jan.	Feb. - mar	Apr.	may	jun- Jul.	aug.	oct.	one	Apr.	may	oct	nov	nov	may	apr
Average Tariff	45	28,8	26,4	20,7	16,3	15,4	18,1	18,3	18,4	17,9	17,2	18,1	9,7	9,7	9,3	11,7	10,2	9,8	9,1
Std Deviation	22,5	13,9	12,8	10,6	8,3	8,9	8,3	5,2	5,2	5,2	5,3	8,3	9,5	9,5	8,9	7,7	5,1	9,5	5,7
Mode		40	37	30	24	24	24	24	24	24	24	22							
Máximum	85	40	40	30	24	24	24	24	24	24	24	22	22	35	35	35	20	20	20
Mínimum	0	0	0	0	0	0	0	5	5	5	5	0	0	0	0	0	0	0	0

Source: Cristini, (1991) and Fiel

Table 5
BRASIL - Average nominal tariff

Year	1980	1990	1991	1992	1993	1994
SECTORIAL DIVISION						
Agricultural and forestry products	NA	16.40	12.70	11.00	9.90	9.10
Mining	27.00	6.00	3.80	2.20	1.40	1.10
Non-metallic mining products	109.40	25.90	14.80	12.20	8.30	7.20
Metals	77.40	27.00	20.80	17.60	14.60	12.30
Machinery and equipment	56.30	40.70	30.70	26.10	21.30	19.60
Electricity and communications	95.40	45.20	37.00	31.90	26.20	21.50
Transportation equipment	101.90	47.00	37.00	31.40	25.70	21.30
Wood and articles of wood	125.30	21.10	11.30	10.70	10.20	9.90
Furniture	148.20	38.60	31.70	24.70	20.00	20.00
Paper and paper products	120.20	18.10	9.60	7.70	6.80	6.70
Rubber and articles thereof	107.30	51.40	36.70	29.30	20.70	15.20
Chemical products	48.20	17.50	13.10	11.70	10.00	9.50
Pharmacy products	27.90	24.70	18.50	15.70	12.80	12.60
Parfumes and cosmetics	160.50	58.20	41.60	28.70	24.00	19.60
Plastics	203.80	39.20	35.30	30.00	21.50	18.80
Textiles	167.30	35.70	34.70	27.50	23.80	17.00
Apparel articles & footwear	181.20	38.30	33.60	27.00	20.30	16.40
Food	107.80	26.70	20.70	17.00	14.90	13.10
Beverages	179.00	75.20	63.70	53.50	34.70	19.70
Tobacco products	184.60	79.10	69.50	60.00	37.30	19.10
Sundries	87.00	43.90	35.00	28.50	22.40	17.30
Simple Average	115.80	31.40	24.60	20.40	16.40	13.60
Standard Deviation	51.70	17.70	15.20	12.60	9.30	6.90

Source: 1980: Peñalver et al. (1983), Table 33; 1990-94,
Calculated from H. Kume y G. Piani (1991)

TABLE 6

Foreign Trade of Argentina by Regions

	Years	EXPORTS		IMPORTS		Balance	TOTAL (expo + impo)	
		Millions US$	Share from Total (%)	Millions US$	Share from Total (%)	Millions US$	Millones de US$	% del Total
MERCOSUR	1994	4740	30	5129	24	-389	9869	26
	1993	3684	28	4213	25	-529	7897	26
	1992	2327	19	3755	25	-1428	6082	22
	1991	1978	17	1805	22	173	3783	19
	1987	769	12	1003	17	-235	1772	15
	1985	668	8	698	18	-30	1365	11
Rest of LAIA (excludes México)	1994	1867	12	1190	6	677	3057	8
	1993	1384	11	983	6	401	2367	8
	1992	1356	11	1026	7	331	2382	9
	1991	1155	10	763	9	392	1918	9
	1987	508	8	568	10	-60	1076	9
	1985	563	7	541	14	22	1104	9
LATIN AMERICA and CARIBEAN BASIN (excludes México)	1994	6607	42	6319	29	288	12926	35
	1993	5381	41	5425	32	-44	10806	36
	1992	4020	33	5012	34	-992	9032	33
	1991	3530	29	2713	33	818	6243	31
	1987	1505	24	1653	28	-148	3158	26
	1985	1623	19	1271	33	352	2894	24
NAFTA (Includes México)	1994	2065	13	5344	25	-3279	7409	20
	1993	1548	12	4138	25	-2590	5686	19
	1992	1614	13	3453	23	-1839	5068	19
	1991	1517	13	2073	25	-556	3590	18
	1987	1012	16	1149	20	-138	2161	18
	1985	1318	16	780	20	538	2098	17
TOTAL for AMERICA	1994	8672	55	11663	54	-2991	20335	55
	1993	6929	53	9563	57	-2634	16492	55
	1992	5635	46	8465	57	-2830	14100	52
	1991	5047	42	4786	58	261	9833	49
	1987	2517	40	2802	48	-286	5319	44
	1985	2941	35	2051	54	889	4992	41
EUROPEAN UNION (EU)	1994	3874	25	6168	29	-2294	10042	27
	1993	3646	28	4139	25	-493	7785	26
	1992	3730	30	3633	24	97	7363	27
	1991	3956	33	2033	25	1923	5989	30
	1987	1815	29	1853	32	-39	3668	30
	1985	2041	24	1069	28	972	3110	25
SUBTOTAL (1)	1994	12546	80	17831	83	-5285	30377	81
	1993	10575	81	13702	82	-3127	24277	81
	1992	9365	77	12098	81	-2733	21463	79
	1991	9003	75	6819	82	2184	15822	78
	1987	4331	68	4655	80	-324	8986	74
	1985	4982	59	3120	82	1862	8102	66
REST OF THE WORLD	1994	3193	20	3713	17	-520	6906	19
	1993	2543	19	3082	18	-540	5624	19
	1992	2870	23	2774	19	96	5644	21
	1991	2975	25	1457	18	1518	4431	22
	1987	2024	32	1153	20	871	3177	26
	1985	3409	41	694	18	2715	4103	34
GRAND TOTAL	1994	15739	100	21544	100	-5805	37283	100
	1993	13118	100	16784	100	-3666	29902	100
	1992	12235	100	14872	100	-2638	27107	100
	1991	11978	100	8275	100	3702	20253	100
	1987	6355	100	5808	100	547	12164	100
	1985	8391	100	3814	100	4577	12205	100

Source: INDEC, CEI Report on Foreign Trade

(1) Por no contarse con información para los países del Caribe en 1994, este subtotal corresponde a ALADI en ese año

(2) Ex Comunidad Europea (CE); (3) Total América y UE

Table 7

FOREIGN TRADE OF BRASIL BY REGIONS

		EXPORTS		IMPORTS		BALANCE	TOTAL (expo+impo)	
		Millions of US$	Share from Total (%)	Millions of US$	Share from Total (%)	Millions of US$	Millions of US$	Share from Total (%)
MERCOSUR	1994	5,922	14	4,618	14	1,304	10540	14
	1993	5,396	14	3,332	13	2,064	8728	14
	1992	4,097	11	2,249	11	1,848	6346	11
	1991	2,309	7	2,269	11	40	4578	9
	1987	1,388	5	888	6	500	2276	6
	1985	990	4	684	5	306	1,674	4
Rest of LAIA (excludes México)	1994	2,773	6	1,405	4	1,368	4178	5
	1993	2,752	7	1,035	4	1,717	3787	6
	1992	2,381	7	1,024	5	1,357	3405	6
	1991	1,311	4	687	3	624	1998	4
	1987	1,414	5	672	4	742	2086	5
	1985	1,018	4	549	4	469	1,567	4
NAFTA (includes México)	1994	10,366	24	8,508	26	1,858	18874	25
	1993	9,474	24	6,980	27	2,494	16454	26
	1992	8,574	24	5,821	28	2,753	14395	26
	1991	6,655	21	5,689	27	966	12344	23
	1987	8,058	31	3,810	25	4,248	11868	29
	1985	6,751	26	3,379	26	3,372	10130	26
TOTAL for AMERICA	1994	21,055	48	14,531	44	6,524	35586	46
	1993	17,622	45	11,347	44	6,275	28969	45
	1992	15,052	42	9,094	44	5,958	24146	43
	1991	10,275	32	8,645	41	1,630	18920	36
	1987	10,860	41	5,370	36	5,490	16230	39
	1985	8,759	34	4,612	35	4,147	13371	34
EUROPEAN UNION (EU)	1994	11,812	27	8,291	25	3,521	20103	26
	1993	10,052	26	5,818	23	4,234	15870	25
	1992	10,627	30	4,577	22	6,050	15204	27
	1991	9,850	31	4,679	22	5,171	14529	28
	1987	6,941	26	3,365	22	3,576	10306	25
	1985	6,556	26	1,896	14	4,660	8452	22
SUBTOTAL (1)	1994	32,867	75	22,822	69	10,045	55689	73
	1993	27,674	71	17,165	67	10,509	44839	70
	1992	25,679	72	13,671	67	12,008	39350	70
	1991	20,125	64	13,324	63	6,801	33449	64
	1987	17,801	68	8,735	58	9,066	26536	64
	1985	15,315	60	6,508	49	8,807	21823	56
REST OF THE WORLD	1994	10,691	25	10,153	31	538	20844	27
	1993	11,109	29	8,513	33	2,596	19622	30
	1992	10,182	28	6,883	33	3,299	17065	30
	1991	11,495	36	7,717	37	3,778	19212	36
	1987	8,422	32	6,315	42	2,107	14737	36
	1985	10,324	40	6,645	51	3,679	16969	44
GRAND TOTAL	1994	43,558	100	32,975	100	10,583	76533	100
	1993	38,783	100	25,678	100	13,105	64461	100
	1992	35,861	100	20,554	100	15,307	56415	100
	1991	31,620	100	21,041	100	10,579	52661	100
	1987	26,223	100	15,050	100	11,173	41273	100
	1985	25,639	100	13,153	100	12,486	38792	100

Source: Bacen, DTIC y FUN Source: Bacen, DTIC y FUNCEX

(1) América plus EU (1) América plus EU

Table 8

TOTAL EXPORTS INSIDE-OUTSIDE MERCOSUR

	Inside MERCOSUR Mill. U$S	Outside MERCOSUR Mill. U$S	Ratio I/O %	Ratio I/Total %	Ratio O/Total %
1988	3009	41827	7.2	6.7	93.3
1989	3712	42881	8.7	8.0	92.0
1990	4127	42291	9.8	8.9	91.1
1991	5103	40830	12.5	11.1	88.9
1992	7215	43232	16.7	14.3	85.7
1993	10039	44217	22.7	18.5	81.5
1994 (*)	11766	50071	23.5	19.0	81.0

Source: Upon data from INDEC, Foreign Trade Secretary of Brasil, Central Bank of Paraguay.
COMTRADE (United Nations)

(*) Provisional

EXPORTS INSIDE-OUTSIDE MERCOSUR + CHILE

	Inside MERCOSUR plus Chile Mill. U$S	Outside MERCOSUR plus Chile Mill. U$S	Ratio I/O %	Ratio I/Total %	Ratio O/Total %
1988	4392	47530	9.2	8.5	91.5
1989	5480	49304	11.1	10.0	90.0
1990	5771	49243	11.7	10.5	89.5
1991	7108	47842	14.9	12.9	87.1
1992	9828	50744	19.4	16.2	83.8
1993	12905	50767	25.4	20.3	79.7
1994 (*)	15232	58250	26.1	20.7	79.3

Source: Upon data from INDEC, Foreign Trade Secretary of Brasil, Central Bank of Paraguay, Central Bank of Chile.
COMTRADE (United Nations)

(*) Provisional data

Table 9

Mercosur
Exports of each partner to the Custom Union
(US$ millions)

	ARGENTINA	BRASIL	PARAGUAY	URUGUAY	TOTAL
1984	656	1322	101	226	2304
1985	668	990	82	213	1953
1986	895	1170	133	392	2591
1987	767	1388	127	329	2611
1988	875	1643	155	336	3009
1989	1428	1380	379	526	3712
1990	1833	1320	379	595	4127
1991	1977	2309	259	557	5103
1992	2327	4097	246	544	7215
1993	3684	5395	298	661	10039
1994 (*)	4740	5922	377	728	11767

Source: INDEC, SECEX / MICT and Central Bank of Paraguay
(*) Provisional data

Table 10

CHILE

Foreign Trade of Chile by Regions

		EXPORTS		IMPORTS		BALANCE	TOTAL (expo+impo)	
		Millions of US$	*Share from Total (%)*	*Millions of US$*	*Share from Total (%)*	*Millions of US$*	*Millions of US$*	*Share from Total (%)*
MERCOSUR	1994	1352	12	2055	18	-703	3407	15
	1993	1089	12	1761	17	-672	2850	14
	1992	991	10	1741	18	-750	2731	14
	1991	770	9	1332	18	-562	2102	13
	1987	547	11	589	16	-42	1137	13
	1985	312	8	386	14	-74	698	11
Rest of LAIA (excludes México)	1994	774	7	565	5	209	1338	6
	1993	567	6	664	6	-98	1231	6
	1992	537	5	474	5	63	1011	5
	1991	425	5	562	8	-137	987	6
	1987	285	6	317	8	-32	602	7
	1985	173	5	383	14	-210	556	8
LATIN AMERICA and CARIBBEAN BASIN (excludes México)	1994	2233	19	2720	24	-487	4953	22
	1993	1729	18	2262	21	-533	3991	20
	1992	1609	16	2275	24	-666	3884	20
	1991	1263	14	1941	26	-678	3204	19
	1987	864	17	928	24	-65	1792	20
	1985	504	13	802	21	-298	1306	13
NAFTA (includes México)	1994	2295	20	3167	28	-872	5461	24
	1993	1847	20	2890	27	-1043	4737	24
	1992	1806	18	2326	24	-520	4131	21
	1991	1693	19	1877	25	-184	3570	22
	1987	1214	24	884	23	331	2098	24
	1985	998	26	728	27	270	1726	26
TOTAL for AMERICA	1994	4527	39	5886	49	-1359	10414	46
	1993	3576	38	5153	48	-1576	8729	44
	1992	3415	34	4601	48	-1186	8015	41
	1991	2956	33	3818	51	-862	6774	41
	1987	2078	41	1812	48	266	3890	44
	1985	1501	39	1531	56	-30	3032	46
EUROPEAN UNION (EU) (1)	1994	2716	23	2172	19	544	4724	21
	1993	2445	26	2085	20	359	4530	23
	1992	2932	29	1848	19	1084	4780	24
	1991	2884	32	1409	19	1475	4293	26
	1987	1702	33	917	24	784	2619	29
	1985	1352	35	604	22	748	1956	30
SUBTOTAL (2)	1994	7244	62	8058	72	-814	15302	67
	1993	6021	64	7238	68	-1217	13259	66
	1992	6347	63	6449	68	-102	12795	65
	1991	5840	65	5227	70	613	11066	67
	1987	3780	74	2729	72	1051	6509	73
	1985	2854	61	2135	42	719	4989	51
REST OF THE WORLD	1994	4402	38	3091	28	1311	7492	33
	1993	3395	36	3392	32	3	6787	34
	1992	3779	37	3084	32	695	6863	35
	1991	3209	35	2226	30	982	5435	33
	1987	1322	26	1064	28	258	2386	27
	1985	969	25	608	22	361	1577	24
GRAND TOTAL	1994	11645	100	11149	100	496	22794	100
	1993	9416	100	10630	100	-1214	20046	100
	1992	10123	100	9533	100	590	19659	100
	1991	9048	100	7453	100	1595	16501	100
	1987	5102	100	3793	100	1309	8895	100
	1985	3823	100	2743	92	1080	6565	85

Source: Data from Chilea Source: Data from Chilean Central Bank

(1) Former European Cor (1) Former European Communities

(2) Total for América y El (2) Total for América y EU

Table 11
Regression Results : Gravity Equations
Depend variable: Bilateral trade between Mercosur countries and the rest of the world, 1987 and 1992

	1987				1992			
VARIABLES	R1	R2	R3	R4	R1	R2	R3	R4
Coefficient	-1.98	-2.62	-2.11	-2.56	-3.36	-4.85	-4.07	-4.72
	(-3,27)	(-3,4)	(-2,92)	(-3,29)	(-6,6)	(-7,19)	(-6,9)	(-7,17)
GDP	0.95	0.94	1.09	0.95	0.98	0.95	1.08	1.07
	(26,3)	(25,4)	(27,1)	(25,8)	(32,9)	(31,9)	(31,9)	(31,7)
Distance	-1.4	-1.23	-1.49	-1.25	-1.15	-0.72	-1.03	-0.85
	(-9,7)	(-6,2)	(-7,98)	(-6,4)	(-9,38)	(-4,54)	(-6,5)	(4,83)
Adjacent		0.29	0.31			0.68	0.61	0.49
		(1,34)	(1,54)			(4,07)	(3,91)	(2,97)
Openess			0.79				0.74	0.74
			(7,20)				(6,63)	(6,72)
Mercosur				0.32				0.47
				(1,18)				(2,16)
R^2 - Adjusted	0.676	0.677	0.719	0.676	0.776	0.787	0.813	0.815
S.E. of Regression	0.68	0.68	0.64	0.68	0.54	0.53	0.50	0,49
N° of observations	341	341	341	341	314	314	314	314