Competitiviness, Commercial Blocs and Regional Growth

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ABSTRACT

This paper analyzes the effects of the Mercosul Preferential Trade Agreement on export intensity of different regions in Brazil. A gravity model is employed to explain the intensity of exports of different Brazilian regions according to country of destination, differentiating those pertaining to Mercosul. Using panel data, we implement the model in three different ways: a pooled cross section model, a fixed effects model and a first differences model. Besides GDP, population and distance, typical explanatory variables of the gravity model, indicators of regional openness and competitiveness came out as an important variable to explain regional export performance. Moreover, the results indicate that the Mercosul commercial bloc does not improve the export performance of regions, which are explained by the other economic variables of the model.

KEYWORDS

Mercosul, regional development, and gravity model.

JEL Classification:
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1. INTRODUCTION

The interest in economic integration among countries has recently being renewed, as Free Trade Areas and other types of Preferential Trade Agreements (PTAs) are flourishing all over the world. The debate is very lively on whether regional economic integration ("regionalism") is welfare improving, and thus is a building block towards the achievement of free trade, or if it is welfare reducing, and thus is a stumbling block to achieve free trade[1].

However, even if one agrees that recent Preferential Trade Agreements are, on the majority, committed to open regionalism, and thus welfare improving for participating countries and the world as a whole, economic integration may affect unevenly the regions of participating countries. As relative prices change in these countries, they will increasingly specialize in the production of goods in which they have a comparative advantage; the regions that concentrate a large share of the booming or contracting industries will be more than proportionally affected by economic integration. Therefore economic integration may affect different regions of a country in a different way, thereby easing or aggravating regional disparities in a country (Bröcker 1988). Thus, it is very important that we have a better understanding on how economic integration impacts the economic structure of the regions comprising the participating countries.

The objective of this article is to evaluate the impacts of the different economic integration blocs on Brazilian state's trade flows (as in previous works by the authors, such as Sá Porto 2002a, Sá Porto 2002b, Sá Porto and Canuto 2002 and Sá Porto and Canuto 2004). We will use a gravity model extended to include economic integration variables for the main economic integration blocs, such as Mercosur, Nafta and the European Union (the most relevant trading blocs for Brazil, given the country's total trade). Besides, we will add variables that account for the share of each state interregional and international trade flows on Brazil's total trade, which simulate the openness of regional economies. Moreover, we will add a variable that account for each state's competitiviness. These variable will add to the explanatory power of the model.

But in order to evaluate the impacts of regional integration on Brazil's regional trade flows, instead of using two dummy variables, one for an economic integration bloc and another for a region of the country (as in previous works by the authors), we use a *dummy* variable specific for each trade pair between a Brazilian region and a trading partner. Those impacts will be assessed using Brazilian state exports to twenty-four countries, which account for about 80 per cent of the country's total trade. This approach allows one to evaluate the effects regional integration on state's trade flows in more detail, since we estimate the direct effect that a specific trade flow to a partner country has on a state's economy.

Moreover, as in Sá Porto and Canuto 2004, we will use panel data and implement the model

[1] The literature on whether regional trade arrangements are welfare improving or welfare reducing is vast. See, for example, Pomfret (1988) and Bayoumi e Eichengreen (1997).

in three different ways, following a methodology developed by Cheng e Wall (1999): a pooled cross-section model (PCS model), a fixed effects model (FE model) and a first differences model.

This article is organized in four sections, including this introduction. In section 2 we will review the theoretical and empirical literature of the gravity model, as well as of the regional impacts of economic integration. In section 3, we present our econometric models and results. We present our conclusions in section 4, as well as further research for this study.

2. LITERATURE REVIEW

In this section, we will carry out a brief literature review with regards to the theoretical and empirical aspects of the gravity model, as well as briefly review the literature on the impacts of economic integration on regional development.

2.1 – Theoretical and Empirical Analyses on the Gravity Model

The original gravity model was proposed independently by Tinbergen (1962) and Pöyhönen (1963), and was later on improved by Linnemann (1966). Tinbergen's initial objective was to account for the factors that explained the size of trade flows between two countries. He found three types of factors which explained those flows: the total potential supply of the exporting country, the factors related to the total potential demand of the importing country, and the factors related to a resistance to trade. The first two factors were basically the Gross Domestic Product (GDP) of the exporting and importing country, respectively. Later on, Linnemann included the size of the populations of both countries, in order to reflect the role of economies of scale. Finally, a third factor was resistance to trade, be it natural or artificial. Natural trade resistance was defined as the obstacles to trade imposed by nature, such as transportation costs, transport time etc., whereas artificial barriers are those imposed by governments, such as tariffs, quantitative restrictions, exchange controls, etc. Dummy variables were also included in the model, specially those ones for preferential trade arrangements. Thus, the original gravity model was the following:

$$X_{ij} = a_0 (Y_i)^{a1} (Y_j)^{a2} (N_i)^{a3} (N_j)^{a4} (Dist_{ij})^{a5} e^{(Pref)\, a6} (e_{ij}), \qquad (1)$$

where X_{ij} is the dollar value of exports from country i to country j; Y_i is the nominal value of country i's GDP; Y_j is the nominal value of country j's GDP; N_i is the population of country i; N_j is the population of country j; $Dist_{ij}$ is the distance between the commercial centers of the two countries, and is used as a proxy for the trade resistance variables; Pref is a dummy variable which equals to 1 if both countries belong to a specific preferential trade area and zero otherwise; and e_{ij} is the error term. The coefficients a_0 through a_6 are to be estimated by the econometric regression.

As it was originally proposed, the gravity model's main weakness was its lack of a solid theoretical microeconomic foundation. The model described in equation (1) above is not an economic model, although it is a plausible one. In particular, the greatest challenge was to develop a

structural model from a reduced form model such as equation (1). Many authors have contributed in order to build a theoretical microeconomic foundation for the gravity model, such as Anderson (1979), Bergstrand (1985 and 1989), Deardorff (1998) and Anderson and van Wincoop (2003)[2]. Moreover, other authors have added other explanatory variables to the original gravity equation (such as relative distance, GDP deflator, exchange rates, a country's openness index, etc.), in order to increase its explanatory power.

Besides the problem mentioned above, the gravity model has also other problems from the econometric point of view. The gravity model has been implemented empirically in most cases using cross section data. For instance, one can pick several years in a time series and compare different cross section, evaluating how a coefficient's estimate evolved over time in a specific time period by comparing the coefficient´s estimate of one seccional unit with an estimate of another seccional unit.(one can compare, for example, Mercosur's 1990 coefficient with the coefficient for 1998). But the problem here is that even though this method can yield a high value for the R^2, this method tends to underestimate the trade volume between pair of countries which has a high volume of trade, and it overestimates the trade volume between pair of countries which has low volume of trade (Cheng and Wall 1999). This generates a "heterogeneity bias", which is overcome by Cheng and Wall (1999) by removing the gravity model's assumption of one only intercept for all trade flows between pairs of countries[3].

As we use trade data between the Brazilian states and the country's main trade partners, this problem will arise, as the trade between the state of São Paulo and the United States, for example, is substantially different from the trade between the state of the state of Mato Grosso and Paraguay. To correct this problem, in this article we use a methodology developed by Cheng and Wall (1999), which estimates the gravity model using three different models. The first is the pooled cross section model (PCS model), in which the standard gravity equation is estimated using pooled cross section data, the constrain in which the intercept is the same for all trade pairs is kept, and, finally, the coefficients are estimated using the ordinary least squares (OLS) method for the pooled data[4]. When this model is estimated, the heterogeneity bias is not corrected (the coefficients estimates are indeed biased); rather, those estimates are compared to the estimates of two other models: a fixed effects model and a first differenced model.

In the fixed effects model (FE model), the restriction in which the intercept is the same for all trade pairs is removed and it is assumed that there are fixed and specific effects for each trade flow (the dependent variable in a gravity model)[5]. An advantage of the fixed effects model is that the time invariant variables are incorporated into the specific intercept for each trade pair (Wall

[2]For a detailed literature review on the theorethical foundations of the gravity model, please see Sá Porto (2002b).
[3] Another commom problem with *cross-sections* models is the impossibility of testing the stability of the coeficientes; with this regard, please see Soloaga and Winters (2001).
[4]Cheng and Wall (1999), p.6.
[5] For a detailed analysis on the econometrics of fixed effects models, see Johnston and DiNardo (2001).

1999), solving a possible specification error (Anderson and van Wincoop 2003). That is, the fixed effects model is robust to a possible omission of time-invariant, non-observable regressors (Johnston and DiNardo 2001). Under this method, dummy variables are created for each trade pair (thus simulating the unique intercept for each trade pair) and are added to the original gravity equation.

Finally, our third model is the first differences model (FD model), where the first difference operator is applied to the dependent and independent variables of the standard gravity equation, thus eliminating any time invariant variable (such as distance and adjacency). As in the case of the FE model, the first differences model is robust with regards to any omission of time invariant variables, but it has one disadvantage, as its intercept does not vary for each specific trade pair.

With respect to the empirical tests of the gravity model, it empirically explains a large part of international trade among countries.[6] Moreover, it is being widely used in models which seek to estimate the welfare impacts of a regional integration scheme.[7] The literature on the empirical tests of the gravity model to evaluate regional integration cases is large; since the end of the 1960s, many studies have sought to evaluate the effects of the European Union, such as Aitken (1973), Frankel (1992) and Frankel and Wei (1992), Frankel, Stein and Wei (1995), Kume and Piani (2000), among others.[8]

2.2 – The Impacts of Economic Integration on Regional Development

The impacts of economic integration on regional development can be analyzed theoretically as follows. A neoclassical view of economic theory recognizes that regions have different natural endowments and policy-created strenghts. As economic integration proceeds and trade barriers fall for all participating countries, relative prices change for all sectors within regional economies. Each region will then specialize in the production of the goods that intensively use those endowments and strengths, and the industrial structure of the countries (and their regions) will change accordingly to exploit comparative advantages.

As trade barriers fall, welfare increases for the world as a whole as well as for for the countries whcih participate of a regional integration scheme, but the thoery does not show how

[6] For example, Bergstrand's (1989) generalized gravity equation explained empirically between 40 and 80 percent of the variation across countries in one-digit SITC trade flows

[7] Viner (1950) noted that, while a customs union between some (and not all) countries would create trade and thus have positive effects on welfare, trade diversion might offset these positive effects. A regional integration scheme is net creator of trade if trade creation is larger than trade diversion. These net effects from trade creation and trade diversion are known as the static effects of economic integration. In the gravity model, when a bloc is net trade creator the coefficient for the bloc dummy variable is positive. Note, however, that in some cases it is possible that one or more countries in a regional bloc obtain significant gains even though the bloc's net trade creation is negative (as, for instance, argues Panagariya 1999, p. 483). As in the literature, we assume that a bloc is net trade creator when the net effect is positive.

[8] Once again, see Sá Porto (2002b) for a detailed review of this literature.

those effects are transmitted throughout the regions of participating countries. In fact, it is possible that some countries have positive welfare effects while other may have their total welfare decrease. Trade liberalization given by regional integration benefits the industries (and the regions where these industries are located) which use the factors intensive in the use of the country's most abundant factors, and increases income and welfare in those industries. A region in a country will gain from economic integration if it concentrates a large share of those gaining industries. Moreover, trade liberalization increases the real returns of those factors specific to the country's export industries, and, again, if a region concentrates a large share of those industries, it will gain from regional integration. This is the standard analysis[9] using the neoclassical theory of international trade to assess the impacts of liberalization in the participating countries of a PTA, extended to include the regions of those countries.

The argument is further developed in the more recent new economic geography literature. Fujita, Krugman and Venables (1999) show that, in a relatively closed economy, the capital city (and its larger metropolitan area) is where firms typically have the best access to both domestically produced inputs and to domestic markets. This creates forward and backward linkages in this "core" economy which lead to agglomeration of economic activity there. As trade liberalization moves forward, those linkages become less important, as firms will receive more intermediate inputs from abroad and will sell a larger part of their output abroad, and thus there will be less incentives to locate (in the case of new firms) or maintain location in the country's core. Firms and consumers will become more outward oriented, and trade liberalization will lead to spatial deconcentration. Congestion costs which may develop in the core region help to push industry away from the center and towards other regions. But as external trade now plays the role of balancing supply and demand for each sector's products in each location, industrial specialization is facilitated and driven by intra-industry linkages. Thus, regions will specialize and industrial clustering of particular industries in each region will occur[10].

With respect to the empirical tests of the impacts of economic integration on a participating country's region, note that the empirical tests of the gravity model mentioned in the subsection 2.1 have all dealt with testing the overall impacts of economic integration arrangements, i.e., they assessed the welfare impacts of those arrangements in the countries as a whole. But none of those studies considered how economic integration affected the different regions of a country. Indeed, few studies have tried to evaluate the regional impacts of economic integration[11]. Two of these studies have used the gravity model; one such study is the one by Bröcker (1988). This author uses a variant of the gravity model to estimate the impact of the EEC and EFTA on the regions of four countries in Northern Europe (Germany, Norway, Sweden, and Denmark), and he extends the

[9] A análise padrão sobre os efeitos da liberalização econômica de acordo com a teoria neoclássica do comércio pode ser encontrada nos livros textos de economia internacional, como Krugman e Obstfeld (1999).
[10] Fujita, Krugman and Venables (1999) pp. 329-343.
[11] A more detailed version of this literature review of this subsection can be seen in Sá Porto (2002b).

original gravity model to include other variables, such as regional supply, regional demand, international and interregional trade flows among regions. Using 1970 data, he evaluated the impacts of integration in Europe for a total of 73 regions and 36 industries.

The impacts of Mercosur in Brazil´s regions was evaluated by Sá Porto (2002a). Using a gravity model expanded to include dummy variables for Mercosul and for a region in Brazil, he found that the trade bias[12] with Mercosur has increased from 3.4 in 1990 to 27.1 in 1998 in Brazil´s region South. That is, trade between a state in the Brazilian South (a region that borders all the Mercosur countries) in 1998 was more than 27 times larger than trade with other countries. Brazil´s Southeast, a region which includes the country´s three largest regional economies, saw its trade bias increase from 4.7 in 1990 to 21.9 in 1998. The other regions (North, Northeast and Center-West) also had increases in their trade biases with Mercosur, although at a much smaller scale. He concluded that, although as a whole Mercosur was net trade creating[13] and Brazilian states as a whole benefited from Mercosur, the results imply that a Preferential Trade Agreement such as Mercosur impacts differently the regions of participating countries. Thus, a PTA that is welfare improving for the country as a whole may increase welfare in only a few regions of the partner countries.

Sá Porto and Canuto (2002) continued that study[14], including a industry dummy variable and extending the analysis to the year 2000. In order to analyze the impacts of the change in Brazil's exchange rate regime in early 1999, they showed that Brazilian states' trade flows to Mercosur countries fell substantially in 2000, but they remained higher that trade levels that prevailed prior to the implementation of Mercosur's custom union (January 1st 1995). Sá Porto and Canuto (2004) further extended this previous study, by using panel data and the three models designed by Cheng and Wall (1999) previously mentioned: pooled cross section, fixed effects and first differences models. They showed that regardless of the data type that is used (cross setion or panel), the results for the impacts of Mercosur on Brazilian states trade flows are robust, that is, they are the same and are independent of the data structure used.

Other methods can be used to associate changes in international and interregional trade flows with changes in regional economic structures. One set of models is based on input-output tables, such as the interregional input-output (IRIO) model or the multiregional input-output (MRIO) model, such as Polenske (1970) and Polenske (1980). Shift-share models are also used to estimate the regional impacts of PTAs (such as the study by Kume and Piani 1999).

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[12] In the literature, trade bias is a measure of the net effect of trade creation and trade diversion.

[13] This is true to the extent that higher trade bias with Mercosul will improve welfare in the South and Southeast due to the increase in exports. He used, as in the literature, trade bias as a proxy for changes in welfare effects. However, the view that trade bias can be used as a proxy for changes in welfare effects is not consensual (see, for example, Bhagwati and Panagariya 1996).

[14] See also Sá Porto (2002b).

General equilibrium models have also been used to evaluate the economic integration impacts on the regional economies of participating countries. Barros (1997) used such a model to evaluate the impacts of Mercosur trade flows in Brazil's Northeastern region. By means of a model which simulates the impacts of economic integration by using the changes in the bilateral exchange rates of all Mercosul partners (thus assuming that the effetcs of integration are passed to the economy through changes in relative price, which will in turn affect GDP growth), he found that the impacts of the implementation of Mercosur were positive but modest: the region's GDP would grow by an extra 2% per year due to Mercosur, five years after its implementation. That is less than the rest of the country would due to Mercosur (around 3% a year). Moreover, he also found that those positive impacts on the region's states were differentiated: whereas the states of Ceará and Rio Grande do Norte would benefit the most from Mercosul (and the states of Pernanbuco and Bahia as well), the states of Piauí, Alagoas and Maranhão (the region's poorer states) would hardly benefit from Mercosur, whereas Paraíba would actually lose from Mercosur.

Domingues (2002a) uses General equilibrium model to evaluate the impacts of the Free Trade Area of the Americas (FTAA) to the Brazilian economy, at both regional and industry levels. By diving the country in two regions, the state of São Paulo and the rest of the country, the author shows that at a aggreagate level the implementation of the FTAA would act as a force towards the concentration of production in São Paulo. Moreover, the liberalization from the implementation of the FTAA would have differentiated effects in the countries' sectors, as, for example, the automotive industry would reconcentrate in the regional economy of São Paulo due to the FTAA.

Brandão, Lopes e Pereira (1996) used a GTAP general equilibrium model to simulate the impacts of adopting a complete customs union in Mercosul by the year 2006 on the Brazilian economy as a whole and then in its sectors. They showed that the impacts on Brazil's total production are very small, but the impacts on the country's trade flows are large: the increase in Brazilian exports of capital intensive goods and Machinery and Electrical Equipment goods would be very significant, whereas Brazil's imports would also grow on most sectors considered on that study.

Haddad, Domingues e Perobelli (2001) use another type of general equilibrium model (EFES-IT) to evaluate aggregate as well as regional and industry impacts in Brazil of three possible free trade arrangements: the implementation of the FTAA, the implementation of a Free Trade Area between Mercosur and the European Union (EU), and a generalized (with all Brazil's main trade partners) free trade area. They show that the three regional liberalization schemes have concentration effects in the Brazilian economy, i.e., they tend to reinforce economic activity to locate and/or relocate to the states in the Southeast and South regions, the country's most developed regions. Moreover, they show that regional and industry effects of liberalizations tend to occur in a small set of Brazil's states.

Finally, a GTAP general equilibrium model is also used in Domingues (2002b), where he uses that model to simulate the welfare impacts in Brazil, Argentina and Uruguay of two possible free trade arrangements: the implementation of the FTAA, and the implementation of a Free Trade Area between Mercosul and the European Union (EU). He found that in the first case all non-FTAA countries would have welfare losses, and Argentina and Uruguay as well. In that simulation Brazil would face net welfare gains from an FTAA. In the second case (a Mercosul-EU Free Trade Area) non-participating countries would face welfare losses (as in the previous case), but Brazil, Argentina and Uruguay would have welfare gains, although Brazil's gains would be much larger than those gains accrued to the other two Mercosul partners.

3. ECONOMETRIC MODELS AND RESULTS

In the next section, we will use a standard gravity model but we will add dummy variables for the three main economic integration blocs, namely Mercosur, Nafta and EU (European Union), as well as time dummy variables (as in Sá Porto and Canuto 2004). Moreover, we will add variables which measure Brazil's twenty seven states degree of openness and competitivenes. We use panel data for the state's exports, and the results are evaluated using three different models: a pooled cross section model (PCS model), a fixed effects model, (FE model) and a first differences model (FD model).

In section 3.2 we evaluate the effects of integration in Brazil's states and regions by using another approach. Instead of using a *dummy* variable for a trade bloc and another for a region, and then evaluate its joint effect (as in Sá Porto and Canuto 2004), here we use a dummy variable for a region-country pair. Thus, we have a dummy for the pair Region South and Argentina, for example, another for the pair Region South and Uruguay, and so on. Since we have twenty-four countries and five regions, we have 24 x 5 = 120 region-country dummies. Here we measure the specific effects that a partner country may have on a state's (which belongs to a specific region) export flow by means of a specific dummy variable for a region-country pair.

3.1 Main Model

In this section, the basic model to be estimated (PCS model is the following:

$$\ln X_{ijt} = \ln a_0 + a_1 \ln Y_{it} + a_2 \ln Y_{jt} + a_3 \ln N_{it} + a_4 \ln N_{jt} + a_5 \ln Dist_{ij} + a_6 Adj + a_7 Mercosur + a_8 Nafta + a_9 EU + a_{10} Dummy94 + a_{11} Dummy98 + a_{12} Dummy02 + a_{13} Interreg + a14 Internat + a_{15} Compet + \log e_{ij} \quad (2),$$

where Xij is the dollar value of exports from the state i to country j, Yi is the nominal value of state i's GRP, Yj is the nominal value of country j's GDP, Ni is the population of state i, Nj is the population of country j, Distij is the distance between the commercial centers of the state and the country, Adj is a dummy variable which equals to 1 if the state and the country are adjacent, Mercosul is a dummy variable that equals to 1 if the country belongs to Mercosul, and 0 if that is not the case (of course, all the states also belong to Mercosul since Brazil is part of Mercosul), Nafta is a dummy variable that equals to 1 if the country belongs to Nafta, and 0 if that is not the case, EU is a dummy variable that equals to 1 if the country belongs to the European Union, and 0 if that is not the case, Dummy94 is a dummy variable that equals to 1 if the export from state i to

country j occured in 1994, and 0 if that is not the case, Dummy98 is a dummy variable that equals to 1 if the export from state i to country j occured in 1998, and 0 if that is not the case, Dummy02 is a dummy variable that equals to 1 if the export from state i to country j occured in 2002, and 0 if that is not the case, Interreg is state i´s share of interregional trade, Internat is state i´s share of international trade, and Compet is state i´s degree of competitiveness.

These three last variables are defined as follows. Interreg is state i´s share of interregional trade, that is, the state's exports to the rest of Brazil plus the state's imports from the rest of Brazil, and that divided by the country's total interregional trade (the country's total regional exports plus total regional imports). Internat is state i´s share of international trade, that is, the state's exports to the rest of the world plus the state's imports from the rest of the world, and that divided by the country's total international trade (the country's total exports plus total imports). These two variables are measures of the country's degree of openness. Finally, Compet is state i´s degree of competitiveness, that is, the state's exports to the rest of Brazil plus the state's exports to the rest of the world, and that divided by the state's gross regional product. This is a measure of how competitive a state's total exports (interregional and international) are with respect to its Gross Regional Product.

Secondly, we will estimate the first differences model (FD):

$$d(\ln X_{ijt}) = a_{0ij} + a_1 d(\ln Y_{it}) + a_2 d(\ln Y_{jt}) + a_3 d(\ln N_{it}) + a_4 d(\ln N_{jt}) + a_5 \text{Mercosur} + a_6 \text{Nafta} + a_7 \text{EU} + a_8 \text{Dummy94} + a_9 \text{Dummy98} + a_{10} \text{Dummy02} + a_{11} \text{Interreg} + a_{12} \text{Internat} + a_{13} \text{Compet} + \log e_{ij} \quad (3),$$

where the all the variables are the same as in equation (2), d is the first difference operator diferença and a_{0ij} is the intercept of the state-country trade pair. In the first difference model, the effect of the time invariant variables (such as distance and adjacency) is captured by the intercept (as in Bayoumi and Eichengreen 1997).

Then we will estimate the fixed effects model (FE):

$$\ln X_{ijt} = a_{0ij} + a_{0t} + a_1 \ln Y_{it} + a_2 \ln Y_{jt} + a_3 \ln N_{it} + a_4 \ln N_{jt} + a_5 \text{Mercosur} + a_6 \text{Nafta} + a_7 \text{EU} + a_8 \text{Dummy94} + a_9 \text{Dummy98} + a_{10} \text{Dummy02} + a_{11} \text{Interreg} + a_{12} \text{Internat} + a_{13} \text{Compet} + \log e_{ij} \quad (4),$$

where the all the variables are the same as in equation (3) above, a_{0ij} is the is the intercept of the state-country trade pair and a_{0t} is a constant. In a fixed effects model, the are factors specific to a

state-country trade pair, and those effects are correlated with the dependent variable (bilateral trade) and with the independent variables. Thus, in this model we will asuume that the gravity equation has as a unique intercept for each state-country trade pair and one for all bilateral trade flows. Since we have 27 states and 24 countries (Brazil's lagest trade partners in 2003) in the sample, we thus have 648 intercepts for the different state-country trade pairs[15].

We have chosen to use the standard gravity equation, with all of its traditional variables: GDP, population and distance. We tried to substitute the population variables with per capita GDP, but its coefficients were neither stable nor significant. Moreover, after our tests we removed the adjacency variable for it was insignificant in the presence of the distance variable. We also added variable which were proxies for a state openness, the state's shares of interregional[16] and international trade, and they contributed to increase the model's explanatory power. Finally we added a variable, the state's competitiveness index, to measure the effect of a state's degree of competitiveness on its trade.

With respect to the treatment of the data, we remover all zero flows in order to remove the influence with trade very little or did not trade at all abroad. We only kept the state-country flows which were greater than zero for at least two years in our sample (which included, as mentioned before, the years 1990, 1994, 1998 e 2002). In table A.1 (in the appendix), we marked all the export and import trade flows with a X and a M, respectively, and we marked the zero trado flows with a zero.[17].

The results for the coefficient estimation for the three models are displayed in Table 1. In the case of the PCS model, we first notice that the coefficients for GDPs (Y_i and Y_j) and for distance ($Dist_{ij}$) have the expected sign and are significant. Second, one of the population coefficients (the one for the partner country) was not significant, although the coefficients for the exporting state was significant. Moreover, the time dummies were not significant either, and one did not have the expected sign (in the case of 1998). These results were similar to other studies by the authors.

With regards to the regional integration dummy variables (Mercosur, Nafta and EU), we notice that the Mercosur coefficient is significant but considerably less significant here than in Sá Porto and Canuto (2004), for instance[18]. The reason for this is that Mercosur is a less important destination for Brazilian states' exports than it is for Brazilian state's total trade, i.e., Mercosur is

[15] The twenty four countries are the following (with corresponded to 85 percent of Brazil's total trade in 2003): France, Germany, Italy, United Kingdom, Netherlands, Belgium, Spain (which are part of the European Union), United States, Mexico, Canada (which are part of NAFTA), Argentina, Paraguay, Uruguay (which are part of Mercosul), Chile, Colombia, Venezuela, China, Japan, South Korea, Russia, Switzerland, Nigeria, Saudi Arabia and Algeria. The 27 Brazilian states are: São Paulo, Rio de Janeiro, Minas Gerais, Espírito Santo (which comprise the Region Southeast), Paraná, Santa Catarina, Rio Grande do Sul (which comprise the Region South), Goiás, Mato Grosso, Mato Grosso do Sul, Distrito Federal (which comprise the Region Center-West), Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia (which comprise the Region Northeast), Acre, Amapá, Amazonas, Pará, Rondônia, Roraima e Tocantins (which comprise the Region North).

[16] This index was built based on interregional data (see Haddad et al. 2002). This variable is of importance, as a large share of Brazil's states trade is done with other Brazilian states (see Perobelli 2004).

[17] The source of this data is SECEX (2003).

[18] Note that while here we used export data, Sá Porto and Canuto (2004) used total trade (exports plus imports) data.

more important for Brazil's imports than for Brazil's exports. For the EU coefficient, unlike Sá Porto and Canuto's (2004) results, the EU coefficient is significant. This means that the EU is important for Brazilian states' exports (and less important for states' imports). That is, in spite of the absence of trade preferences between Brazil and the EU, that bloc of countries is an important destination for Brazilian states. Finally, the NAFTA coefficient is not significant (as in Sá Porto and Canuto 2004). This may be an odd result at first, as Nafta countries (specially the U.S.) are an important trade partner of Brazilian states. This may be due to the fact that these trade flows may have specificities that cannot be explained to this aggreagate variable and needed to be explained by the dummies of the state-country trade pairs (the subject of the next section)

The coefficient of the share of interregional trade variable was significant and had the expected sign (negative), that is, the states which have larger shares of interregional trade tend to trade less internationally. Moreover, the coefficient of the share of international trade variable was also significant and had the expected sign (positive), the states which have larger shares of interregional trade tend to trade more with foreign countries. Finally, coefficient for the degree of competitiveness variable was significant and had the expected sign (positive), meaning that states that are more competitive tend to trade more with Brazil's trade partners.

Table 1 - Gravity Equation Coefficients Estimates for the Export Trade Flows between Brazilian States and Brazil's Major Trading Partners, PCS, FE e FD Models , 1990-2002

Independent variable	"Pooled" Cross Section data (PCS)	Fixed Effects(FE)	First Differences (FD)
Constante a_{0ij}	-14.05*	_**	-1.86*
	(1.36)		(1.55)
Y_i	0.57*	0.44*	0.37*
	(0.10)	(0.09)	(0.09)
Y_j	0.84*	0.67*	0.65*
	(0.05)	(0.04)	(005)
N_i	0.94*	0.89*	0.94*
	(0.11)	(0.13)	(0.12)
N_j	0.03	0.01	0.09
	(0.18)	(0.15)	(0.17)
$Dist_{ij}$	- 0.71*	_***	_***
	(0.12)		
Mercosul	1.05*	2.01*	1.89*
	(0.18)	(0.18)	(0.20)
NAFTA	0.22	0.19	- 0.03
	(0.16)	(0.12)	(0.13)
EU	0.75*	0.56*	0.49*
	(0.12)	(0.09)	(0.14)
1994	0.14	-0.03	0.17
	(0.12)	(0.10)	(0.13)
1998	- 0.19	-0.16	0.01
	(0.17)	(0.10)	(0.12)
	0.18	0.08	- 0.02
2002	(0.16)	(0.10)	(0.10)
Interregional	-4.64*	_***	_***
	(2.00)		
International	4.40*	_***	_***
	(1.88)		
Competitiviness	2.75*	_***	_***
	(0.20)		
R^2	0.57	0.43	0.39
Number of observations	1961	1961	1961

* Significant at the 5% level, one-tail test.

** The trade pair intercepts were omitted for space reasons.

*** These variables are invariant in the FE and FD models.

Notes: X_{ij} is the dependent variable. Standard errors are given in parentheses. All variables except dummies are expressed in natural logarithms for the PCS and FE models, and in first differences for the FD model; estimation by ordinary least squares.

The results for FE and FD models are as follows. First we notice that variables such as distance, degree of openness (interregional and international) and degree ofcompetitivenes were excluded since they are time invariant[19]. Moreover, we also notice that the values for the coefficients for the GDP (0.44 and 0.67 for the FE model, and 0.37 and 0.65 for the FD model, respectively) and population (0.89 and 0.01 for the FE model, and 0.94 and 0.09 for the FD model) variables are not substantially different from the results for the PCS model. They were somewhat lower in the FE and FD models. With regards to the regional integration variables, the Nafta coefficients remained insignificant in both models. The Mercosur and Eu coefficients were now larger than the PCS model: 2.01 and 0.56 for the FE model, and 1.89 and 0.49 for the FD model, respectively. Finally, the time dummies were all insignificant, as was the case in the PCS model.

3.2 Main Model with region-country pairs dummies

In this section, we will choose one of the models from the previous section (PCS, FE and FD models) and then add dummies for all of the region-country pairs. The objective here is to evaluate whether there are specific effects on Brazilian state's exports that are explained by factors that are related to that specific sending region or receiving country for that trade flow. We will use the same panel data and the PCS (pooled cross section) model, which is equivalent to the fixed effects and first differences models previously shown. The three model that were estimated in the previous subsection yielded similar results for the coefficients, but the PCS model comprises all the variable, including the time invariant variables, so that it is easier to assess the increased explanatory power that may eventually be added to the original model by the new region-country dummy variables. Thus, our model is as follows:

$$\ln X_{ijt} = \ln a_0 + a_1 \ln Y_{it} + a_2 \ln Y_{jt} + a_3 \ln N_{it} + a_4 \ln N_{jt} + a_5 \ln Dist_{ij} + a_6 Adj + a_7 Mercosur + a_8 Nafta + a_9 EU + a_{10} Dummy94 + a_{11} Dummy98 + a_{12} Dummy02 + a_{13} Interreg + a14 Internat + a_{15} Compet + a_{ij} Region_i\text{-}Country_j + \log e_{ij} \quad (5),$$

where the all the variables are the same as in equation (1), and $\underline{Region_i\text{-}Country_j}$ Mercosul is a dummy variable for the trade between state i (which belongs to one of Brazil's five regions) and country j (one of 24 Brazil's main trade partners). If, for example, a dummy $\underline{Region_i\text{-}Country_j}$ is defined for the trade between Region Southeast and Argentina, that dummy equals to 1 if the state belongs to Region Southeast (for example, São Paulo) and the country is Argentina, and 0 if that is

[19] Our interregional and international trade share and degree of competitiveness indices were built for the year as in Haddad et al. (2002).

not the case. We have to choose a reference region, so that we do not get perfect multicolinearity in our regression, so we chose the Region Northeast as the reference region since it is the less open of all five Brazilian regions. Thus, we have 4x24 = 96 of these dummies.

We had similar results as in the previous subsection with respect to the stability and significance of the coefficients of GDP, population, distance, NAFTA, EU, time dummies, and openness and competitiveness variables, so we will thus concentrate here on the analysis of the region-coutry pairs coefficients. Our results are presented in Table 2, where we only present the regression estimates for those coefficients that are significant. Turning our attention to Mercosur countries, we notice that the only export flows to those countries that are important (relatively to the reference region) is the exports from Region South (to Paraguay) and North (to Argentina and Uruguay). Region Center-West had a negative coefficient with respect to exports to Paraguay, meaning that the Center-West exports less to Paraguay than the reference region (the Northeast), which is supposedly the less open Brazilian region. The estimates for the coefficients for the other export flows are not significant, meaning that there are not any other factors left to be explained solely to specificities of that particular trade flow, that is, the traditional gravity variables, plus the regional integration and the degree of openness and competitiveness variables can solely explain those trade flows.

We also note that, when we look at the export flows towards European countries (EU and non-EU), there are important specifities to export flow to those countries, specially from Region South, Southeast and North. The same happens with export flows from the South and the Southeast towards Mexico and the U.S. Things like trade agreement in some sectors such as the automobile industry and trade links that have been forged since colonial times (such as export of coffee and iron ore to Europe) may explain some of those specifities.

South American countries that are not part of Mercosul have also trade specificities with exports coming from regions South and Southeast. Russia and South Korea have trade specificities with regions South and Center-West. Finally, Japan and China have important import links left to be explained with all of the four regions.

Table 2 - Gravity Equation Coefficients Estimates for the State-Country pair Dummies, for the Export Trade Flows between Brazilian States and Brazil's Major Trading Partners, PCS Model, 1990-2002

		Region			
Bloc	**Country**	**S**	**SE**	**N**	**CW**
Mercosur	**ARG**	-	-	1.82	-
	URU	-	-	1.26	-
	PAR	1.46	-	-	- 1.44
Nafta	**MEX**	1.79	1.62	-	-
	USA	2.14	1.69	-	- 1.35
	CAN	-	-	-	- 2.13
EU	**FRA**	1.76	-	1.05	-
	GER	2.34	1.25	0.96	0.58
	ITA	2.24	1.61	-	-
	UKG	2.34	-	1.25	-
	NTL	3.39	1.97	1.09	4.22
	BEL	2.82	2.19	1.85	2.09
	SPA	2.39	1.06	1.05	-
South America	**COL**	1.11	-	-	- 2.78
	VEN	1.44	1.14	-	- 1.51
	CHL	1.39	1.32	-	- 1.65
Rest of Europe	**SWI**	1.11	-	-	-
	RUS	2.63	-	-	2.15
Rest of Asia	**JAP**	2.05	1.59	2.35	1.17
	CHI	3.67	2.54	1.61	2.18
	KOR	2.01	2.66	-	1.21
Africa/ Middle East	**NIG**	2.17	-	-	-
	ALG	-	-	-	-
	SAU	3.38	1.45	-	-

4. CONCLUSIONS AND FURTHER RESEARCH

In this paper w presented a model that shows the aggregate impacts of Mercosul in Brazil's regions, a model that controls for income and distance effects and concentrates on the economic integration, openness, competitiveness and specificities of region-country pair effects on the Brazilian states' trading patterns. We showed in last subsection that the openness variables (share of interregional and international trade) and the degree of competitiveness variable were important in order to explain Brazilian states export patterns.

Moreover, we showed that, besides of the traditional gravity variables (GDP, population and distance), the economic integration variables (such as Mercosur, EU and Nafta), and the openness and competitiveness variables, in some specific cases there are things left unexplained by those previous variables that are specific to a region-country trade pair. For example, we showed that Japan and China have trade biases with all four (South, Southeast, North and Center-West) regions, with regards to exports coming from those regions to those countries.

This study can be extended in several ways. First, we can assess the previously mentioned impacts at the industry or sectoral level. In order to evaluate this, we can estimate the current gravity equation using data at the industry level, aggreagted at the one-digit SIC level, for example, or with the sectors grouped in a few sectors, in a classification which include, for example: agriculture, natural resource-based industry; non-durable consumer goods; durable consumer goods; and intermediate goods. Moreover, we can further increase the explanatory power of the model by adding interactive dummy variables, such as: industry-GDP interaction dummy; distance-industry dummy; and region-industry-country interaction dummy.

APPENDIX

Table A.1: Presence of trade flows between Brazilian states and Brazil's trade partners, 1990, 1994, 1998 e 2000.

	ARG	CHL	FRA	GER	ITA	JAP	MEX	HOL	PAR	U.K.	URU	USA
AC	000X	0X00	0000	000X	0X0X	000X	0X00	000X	0000	XX0X	000X	XXXX
	00mm	0000	00m0	0000	0000	mmmm	0000	0000	0000	0m00	0000	mmmm
AL	XXXX	0XX0	XXXX	XXXX	XX0X	XXXX	0000	00XX	00X0	0000	0XXX	XXXX
	mmmm	0mmm	mmmm	mmmm	mmmm	mmmm	mmm0	0mmm	mmmm	mmmm	00mm	mmmm
AM	XXXX	XXXX	XXXX	XXX0	XXXX	XXXX	XXXX	X0XX	XXXX	XXXX	XXXX	XXXX
	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	m0mm	mmmm	mmmm	mmmm
AP	XXXX	XXX0	XXXX	0XXX	XXX0	XXXX	00X0	XXX0	0XX0	XXX0	XXXX	XXXX
	m0mm	0000	0mmm	mmmm	mmmm	mmmm	00mm	00m0	0000	m0mm	0000	mmmm
BA	XXXX	XXXX	X0XX	XXXX	XXXX	XXXX	XXXX	XXXX	00XX	XXXX	XXXX	XXXX
	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	m0mm	mmmm	mmmm	mmmm
CE	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	0XXX	XXXX
	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm
DF	00XX	00XX	XX0X	XX00	0X0X	00X0	0000	0X0X	0XXX	0000	0XXX	XXXX
	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	m0m0	mmmm	0mmm	mmmm
ES	XXXX	0XXX	0XXX	XXXX	XXXX	XXXX	0XXX	X0XX	00XX	XXXX	00XX	XXXX
	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	0mmm	mmmm	mmmm	mmmm
GO	XXXX	XXXX	XXXX	XXXX	X0XX	XXXX	XXXX	XXXX	XXXX	XXXX	0XXX	XXXX
	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	0mmm	mmmm	mmmm	mmmm	mmmm	mmmm
MA	XXXX	0XXX	X0XX	XXXX	X0XX	XXXX	XXXX	XXXX	0XX0	0XXX	0XX0	XXXX
	mmmm	0000	mmmm	mmmm	mmmm	mmmm	m0mm	mmmm	0000	mmmm	000m	mmmm
MG	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	00XX	XXXX	XXXX	XXXX
	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm
MS	XXXX	000X	XXXX	XXXX	XXXX	XXXX	00XX	XXXX	XXXX	0XXX	XXXX	XXXX
	mmmm	m0mm	mmmm	mmmm	mmmm	mmmm	000m	mmmm	mmmm	0mmm	00mm	mmmm
MT	X0XX	00XX	XXXX	XXXX	XXXX	XXXX	00XX	XXXX	00XX	XXXX	XXXX	XXXX
	mmmm	0mmm	0mmm	mmmm	mmmm	mmmm	00mm	mmmm	0mmm	0mmm	mmmm	mmmm
PA	XXXX	00XX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	00XX	XXXX	00XX	XXXX
	mmmm	0mmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	00m0	mmmm	00mm	mmmm
PB	XXXX	0XXX	X0XX	XXXX	XXXX	XXXX	X0XX	XXXX	XXXX	XXXX	XXXX	XXXX
	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	00mm	mmmm	mmmm	mmmm
PE	XXXX	XXXX	XXXX	XXXX	0XXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mm0m	mmmm	mmmm
PI	XXXX	X0XX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	X0XX	XXXX	000X	XXXX
	0mmm	m0m0	mmmm	mmmm	0mmm	mmmm	mmmm	m0mm	0mmm	0mmm	mmmm	mmmm
PR	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	0XXX	XXXX	XXXX	XXXX	XXXX	XXXX
	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm
RJ	XXXX	XXXX	0XXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm
RN	XXXX	0XXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
	mmmm	mm0m	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	m00m	mmmm	mmmm	mmmm
RO	0XXX	0000	00XX	XXXX	XXXX	0XXX	XX0X	XXXX	00X0	XXXX	0XXX	XXXX
	0mmm	0000	00mm	0mmm	0mmm	mmmm	00mm	0m0m	0000	mmmm	00m0	mmm
RR	X000	0000	0000	000X	0000	0000	0000	0000	0X00	0000	0X00	0X0X
	m000	0000	0m00	0m00	0mm0	mm00	0000	0m00	0000	0000	0000	mmmm
RS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm
SC	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm
SE	XXXX	XXXX	0X00	XX0X	XXXX	0X00	X0XX	XXXX	XXXX	XX00	0XXX	XXXX
	mmmm	0mmm	mmmm	mmmm	mmmm	mmmm	0m00	0mmm	mmmm	mmmm	0mmm	mmmm
SP	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	mmmm	Mmmm
TO	00X0	0000	000X	00XX	00X0	0000	00X0	0XXX	0000	000X	0000	00XX
	00mm	00mm	00mm	00mm	0mm0	0m0m	0000	0000	0000	000m	00m0	0mmm

Note: X = exports are present; M = imports are present; 0 = absence of export or import; first line in for exports, and the second line is for imports; first column=1990; second column=1994; third column=1998; fourth column=2002

REFERENCES

ANDERSON, James E. "A Theoretical Foundation for the Gravity Equation," American Economic Review, Vol. 69 No. 1, pp. 106-116, 1979.

ANDERSON, James E. & VAN WINCOOP, Eric. "Gravity with Gravitas: A Solution to the Border Puzzle," American Economic Review, Vol. 93 No. 1, 2003.

BAYOUMI, T., & EICHENGREEN, B. “Is Regionalism Simply a Diversion? Evidence from the Evolution of the EC and EFTA”, in T. ITO & A.O. KRUEGER, (eds.). *Regionalism versus Multilateral Trade Arrangements*, University of Chicago Press, 1997.

BERGSTRAND, Jeffrey H. "The Generalized Gravity Equation, Monopolistic Competition, and the Factor-Proportions Theory in International Trade," The Review of Economics and Statistics, Vol. 71, pp. 143-153, 1989.

BERGSTRAND, Jeffrey H. "The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence," The Review of Economics and Statistics, Vol. 67, pp. 474-481, 1985.

CHENG, I.-H., WALL, H. J. *Controlling for heterogeneity in gravity models of trade*. Federal Reserve Bank of St. Louis, 1999 (Working Paper, 010B), revised in 2004. Web site:<http:// research.stlouisfed.org/wp/1999/1999-010.pdf>.

DEARDORFF, Alan V. “Does Gravity Work in a Neoclassical World?”, in FRANKEL, Jeffrey, (ed.). *The Regionalization of the World Economy*, University of Chicago Press, 1998.

DOMINGUES, Edson. “Dimensão Regional e Setorial da Integração na Área de Livre Comércio das Américas: Projeções em Equilíbrio Geral para a Economia Brasileira,”. FEA/USP, 2002a (Ph.D. Thesis).

——————. “Sensitivity Analysis in Applied General Equilibrium models: an Empirical Assessment for Mercosur Free Trade Area Agreements.” Latin American Meeting of the Econometric Society (LAMES), São Paulo, July, 2002b.

KUME, Honório & PIANI, Guida. "Efeitos Regionais do Mercosul: uma Análise Diferencial-estrutural para o Período 1990-1995," Economia Aplicada, Vol. 3 No. 1, 1999.

POLENSKE, Karen R. "Empirical Implementation of a Multiregional Input-output Gravity Trade Model," In A. P. Carter and A. Brody, eds. Contributions to Input-output Analysis, 1970.

POLENSKE, Karen R. The U.S. Multiregional Input-output Accounts and Model. Lexington, Mass. : Lexington Books, 1980.

SÁ PORTO, P. C. de. Mercosul and Regional Development in Brazil: a Gravity Model Approach. *Revista de Estudos Econômicos*, v. 32, n. 1, jan./mar. 2002a.

————————. *Os impactos dos fluxos de comércio do Mercosul sobre as regiões brasileiras*. IE/Unicamp, Sep. 2002b (Ph.D. Thesis).

SÁ PORTO, P. C. de, CANUTO, O. Mercosul: gains from regional integration and exchange rate regimes. *Economia Aplicada*, v. 6, n. 4, oct./dec. 2002.

————————. Uma avaliação dos impactos regionais do Mercosul usando dados em painel. *Pesquisa e Planejamento Econômico*, v. 34, n. 3, sep./dec. 2004.

SECEX. *Sistema Alice*. Ministério do Desenvolvimento, Indústria e Comércio (MDIC), 2003.

THORSTENSEN, V. *et alii. O Brasil frente a um mundo dividido em blocos*. São Paulo: Nobel e Instituto Sul-Norte de Política Econômica e Relações Internacionais, 1994.

VINER, Jacob. The Customs Union Issue. Washington, D.C.: Anderson Kramer Associates, 1950.