Trade, Poverty and Employment: The Social Consequences of Integration with China*

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Abstract

This paper estimates the potential effects of a free trade agreement (FTA) between China and Mercosur on poverty, income distribution, welfare and employment. The case of Argentina, in particular, is investigated. To this end, partial equilibrium techniques are combined with micro econometric methodologies employing data from household surveys to examine the likely effects of an FTA with China on poverty and income distribution. We find that the FTA would result in a small reduction in poverty as well as an improvement in the income distribution. Highly disaggregated data at the industry level is used for the first time to estimate labor demand-output and wage elasticities in order to estimate the effects of an agreement with China on sectoral and aggregate employment rates. According to this, trade with the PRC did not have a significant effect on industrial employment, even in a period of swift trade liberalization like the nineties.

Key words: China, Import Competition, Trade and Labor Market Interactions, Employment, Income Distribution, Poverty.

JEL Classification: F14, F15, F16, F17, L60.

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1. Introduction

Imports from the Popular Republic of China (PRC) increased exponentially in the last decade, in parallel to a shredder deterioration of the social indicators of Argentina. Industrial employment, in particular, suffered a stiff reduction over the period. Labor-intensive industries, highly contested by imported products not only from the PRC, in particular, experienced the most pronounced fall in employment and production. Poverty increased and income distribution worsened up significantly, raising concerns on the potentially disruptive effects of highly competitive Chinese imports on jobs and wages of the poor.

As the PRC is rapidly becoming one of the most important destinations of Argentina's exports and a privileged source for its imports, talks about a possible free trade agreement (FTA) between China and MERCOSUR have resounded more loudly. For instance, in a forthcoming study Castro, Monat and Tramutola (2005) examine the feasibility of that FTA and its potential economic effects for the Mercosur countries, with particular attention to Argentina.

Thus, in the first half of this paper, we investigate the potential social impacts that could have such increased trade integration with the PRC for Argentina. To this end, partial equilibrium techniques are combined with micro econometric methodologies employing data from household surveys to examine the likely effects on poverty and income distribution.

A first contribution of this paper is that we refine the micro-simulation / general equilibrium models proposed by Porto (2003a) and Porto (2003b) at estimating econometrically the passtrough of changes in tariffs on imported goods to domestic prices for Argentina. Other advances vis-à-vis the seminal methodology put forward by Porto are also presented.

What is the relationship between trade with the PRC and the steep decrease in manufacturing employment experienced by Argentina in the last decade? In the second part of this paper we try to empirically answer this question for the first time in the literature. To do so, we draw on to a dynamic econometric model that uses panel data for 28 sub-sectors of the Argentine manufacturing industry for 1989-2003. As the empirical literature on the effects of trade with low-wage countries on labor demand has been so far focused on developed countries, this paper makes an additional contribution at exploring for the first time the impact of a low-wage economy such as China on industrial employment in a developing country, Argentina.

2. A Preliminary Ex-ante Evaluation of the Effects of a FTA with China on Poverty, Income Distribution and Welfare for Argentina

2.1. Introduction

The signing of a memorandum of understanding between Argentina and the Popular Republic of China (PRC) in November 2004 started a heated debate about the potential negative effects of Chinese imports on the employment and wage levels. Bearing these worries in mind, this work presents a detailed analysis of the possible effects that an FTA between MERCOSUR and RPC might have on poverty and income distribution in Argentina.

Using a model of micro-simulation based on household surveys, this work presents an ex-ante examination of the impacts of a trade agreement between MERCOSUR and the RPC in the levels of poverty and income distribution in Argentina. Our main finding is that an FTA with the PRC would result in a small reduction of the poverty levels throughout the country, as well as an improvement in the income distribution.

2.2. Recent Developments in Poverty and Income Distribution in Argentina

Historically, Argentina was characterized by social indicators that, in comparative terms, were much more favorable than those found in the rest of Latin America. The levels of poverty, inequality and employment were relatively low in comparison to the countries of the region. Nevertheless, socioeconomic indicators began to deteriorate in the mid-seventies, ending in record levels of poverty and inequality after the 2001/2002 crisis.

Between 1992 and 2002 Argentina experienced a dramatic and persistent growth in poverty (40 percentage points, from 19.9 % to 58 %). In terms of the population base, 15 million people were drawn to poverty in merely ten years. Nevertheless, half of these "new poor" started living below the poverty line as a consequence of the convertibility crisis in December 2001.

Indexes of the poverty gap and severity of poverty experienced similar increases. At the same time, the evolution of extreme poverty proved to be equally serious during the nineties, where the equivalent of 9 million people could not afford the minimum caloric intake needed to survive, in the form of a Basic Food Basket (BFB).

In contrast, socioeconomic indicators began to improve after 2003, when economic growth resumed. Led by import-substituting sectors, industrial employment recovered from the continuous slump experienced since 1998. This relationship between poverty and unemployment is highlighted by some authors like Kritz (2004), that finds that a high percentage of poor people come from an unemployed household (about 40%).

CEDLAS (2004) used income distribution indicators such as the Gini and Theil Indexes to monitor the socioeconomic situation throughout the nineties. All indicators

present the same trend: a strong growth in income inequality between 1992 and 2001, followed by a moderate decline from 2002 on.

By the end on 2004, poverty levels –although improved with respect to 2002- remained at a stubbornly high 40.2%. Indigence, or extreme poverty, remained at a 15%. These two indicators consist of our baseline scenario.

2.3. Trade, Poverty and Income Distribution: A brief review of the literature for the Argentine case

The structural reforms experienced by Argentina during the nineties, provoked great interest in the effects of trade liberalization on poverty and income distribution. All studies published up to date, focus on the effects of trade liberalization in the observed wage gap between skilled and unskilled workers, and thus, in income distribution. Its impact on poverty, without any doubt, has been dangerously neglected, with exception of the seminal work put forward by Porto (2003a).

Though the increasing wage gap between skilled and unskilled workers seems to be a worldwide phenomenon, the assessment of the Argentine case presents a number of additional questions. Due to the structural reforms implemented during the nineties, the true cause of the increasing poverty and inequality levels has remained elusive, and under constant debate.

Galiani and Sanguinetti (2003) found evidence of an increase in the wage gap of skilled and unskilled workers for Argentina, coming to the conclusion that the trade liberalization only explains 10% of the change in the wage differential. Gasparini and Acosta (2004) reach to a similar conclusion, accounting the higher openness to trade a 15 % of the difference in the labor income. In turn, Cicowiez (2001) finds a similar, but significantly smaller result (3 %) with a CGE setup.

These studies, however, only examine the effects of trade liberalization on labor income distribution. As mentioned, the first model that explicitly linked trade reforms, poverty and welfare for the Argentine case was developed by Porto (2003a, 2003b). Porto put forward an ambitious empirical framework that incorporates household heterogeneity in a general equilibrium model of trade. Using such a framework, this author found pro-poor welfare effects in the MERCOSUR implementation. Likewise, in an ex-ante assessment, he found potential poverty reducing effects both in a national trade reform scenario (i.e. unilateral tariff reduction of Argentina) and in a foreign trade reform scenario (i.e. elimination of tariffs in the rest of the world) of about 2-5% of the Argentinean population base.

Accordingly, the present study tries to contribute to the debate with an assessment of the potential social consequences for Argentina in poverty, income distribution and welfare of an FTA between MERCOSUR and PRC. In order to so, we extend and modify the Porto (2003a, 2003b) setup, as we will discuss in the next section.

2.4. The model

2.4.1. Poverty Effects

As mentioned, this section tries to estimate the potential poverty effects of an FTA with PRC, extending Porto's (2003a) model. As the author points, the main methodology consists of three different links. The first one is a trade shock that causes a change in the domestic prices of traded goods (exports and imports) in Argentina. The second one measures the labor income response of households in Argentina, followed by the induced change in poverty, via the headcount ratio.

Trade policy affects domestic prices of different goods. In this paper, we expand the set of original products to six. Three exportable goods, such as agricultural manufactures (dairy products, beef, oils), industrial manufactures (textiles, chemicals, transport material) and Primary goods (oilseeds, hides). And three importable goods, such as consumption goods (food, appliances) and capital goods (machines), and intermediate goods (inputs). It is assumed that Argentina is a small open economy, facing exogenously given prices for these goods.

An FTA with PRC would introduce a shift in protection due to a preferential reduction of tariffs for Chinese imports. This change would affect the price of the importable good g in region r, according to

$$(1) \qquad p^{i}_{g,r} = p^{i}_{g} * \psi_{r}\left(\tau_{g}\right)$$

Where $p^{i}_{g}*$ is the international price and $\psi_{r}\left(\tau_{g}\right)$ is the passthrough coefficient function. Whereas the original model only assumes a passthrough between 0.2 and 0.8 for all goods, **this paper estimates a regional passthrough coefficient for all imported goods**, as we explain below.

In turn, due to lack of data, we cannot estimate a passthrough function to domestic prices of exports.[1] Domestic price of exports is then defined by

[1] According to 2003 official data, Argentina only exported to the PRC 249 products at six-digit level of the HS system. Exports were narrowly concentrated on primary and energy products, with soybeans and soy oil accounting for almost 84 percent of total exports to the PRC. Imports from PRC were more diversified but only accounted for 8 percent of total Argentine imports. As Castro, Monat and Tramutola (2005) remark, it is expected that a FTA with the PRC will increase significantly Argentine exports, in particular of agriculture products where the country has a comparative advantage. Specially, exports of food products that represent an important share of the household consumption basket could experience a very marked boost in volumes and prices as they face very high tariff and non-tariff protection in China. Going back to Diaz Alejandro (1965) and Canitrot (1983), the literature has dubbed this group of products as "wage goods". According to this view, the Argentine economy has the peculiarity that some of the principal tradable goods also account for the lion's share of the household consumption basket. A depreciation of the real exchange or steep increases in the international prices of these goods would hence have a negative impact on household income and therefore in income distribution and poverty. In a forthcoming version of this paper we propose a methodology to estimate the passtrough of these "wage goods" to domestic prices and thus poverty and income distribution.

(3) $$p_g^e = p_g^e * \left(\tau_g^*\right)$$

Where p_g^e is the international price and τ_g^* is the Chinese MFN. As Nicita and Olarreaga (2000) assume, producers receive the international price for their exports. Consumers in China, in contrast, pay a higher value since the Chinese MFN makes imports more expensive. After the FTA is implemented, equilibrium prices paid by Chinese consumers are unchanged, since the Argentinean supply is not large enough to satisfy the Chinese demand, therefore not affecting prices inside China. As a result, Argentinean exporters now receive the international price plus the MFN for their exports. This represents an increase in the domestic price of exports equal to the Chinese MFN, weighted by the export share to PRC.[2]

Changes in the Wage Revenue of the Households

Labor income of each household is defined by

(4) $$Y^j = \sum_m w_m^j$$

Where w_m^j is the labor income of each household member m. The change in household income given a change in the Chinese MFN, and therefore export prices is then

(5) $$dY^j = \sum_m \frac{\partial w_m^j}{\partial p_g^e} \frac{\partial p_g^e}{\partial \tau_g^*} d\tau_g^*$$

Since a very similar expression can be put forward for the case of a change in the Argentinean MFN and its effect on import prices, the percentage change in total household labor income equals

(6) $$\frac{dY^j}{Y^j} = \sum_m \theta_m^j \varepsilon_{w_m^j} \frac{\partial \ln p_g^e}{\partial \tau_g^*} d\tau_g^*$$

Where $\varepsilon_{w_m^j}$ is the elasticity of the wage earned by household member m with respect to the price p_g^e, and θ_m^j is the share of the labor income of the member m in total household income. The estimated change in household income j, $\Delta \hat{Y}^j$, is therefore

[2] We assume that both China and Argentina reduce all its tariffs to zero.

(7) $$\Delta \hat{Y}^j = Y^j \left(\sum_m \theta_m^j \hat{\varepsilon}_{w_m^j} \right) \Delta \ln \hat{p}_g^e \left(\tau_g^*; \tilde{\tau}_g^* \right)$$

Where, generically $\tilde{\tau}_g^*$ is the new Chinese MFN (zero after the FTA is implemented), $\hat{p}_g^e$ is the predicted price of the exported good g, and $\hat{\varepsilon}_{w_m^j}$ is the predicted price-wage elasticity. The predicted household income j is then

(8) $$\tilde{Y}^j = Y^j + \Delta \hat{Y}^j$$

Measuring Poverty Effects

As Porto (2003a), we introduce one of most often used indicators for measuring poverty in the literature: the headcount ratio. It measures the percentage of the population who is below the line of poverty z.

(14) $$HC = \frac{1}{N} \sum_i 1\{y^i < z\}$$

N represents the whole of the population, and 1 {} is a function that takes the value of 1 if the income every individual i is bigger than the poverty line z. Both the individual income and the line of the poverty are expressed in units of equivalent adult. This methodology adjusts the individual income to account for different caloric needs, according to the age and genre of the individual.

To calculate the effects on poverty of an FTA with PRC, it is necessary to obtain the "counterfactual" income for every individual in the sample. The new headcount ratio, $\tilde{F}(z)$, is the accumulated density function of the logarithm of the counterfactual (predicted) individual income, $\tilde{y}^i$. Therefore, if the FTA is poverty reducing, the expression (14b) should hold.

(14b) $$F(z) \geq \tilde{F}(z)$$

If we use (14) to calculate the changes in the poverty, a significant bias will be introduced due to the limited size of the sample. Therefore, we must use the empirical approximation to the formula (14b) with non-parametric methods. The change in the headcount ratio then is defined by

$$(15) \qquad \Delta\hat{HC} = \frac{1}{nh}\int_0^z \sum_i \left[K\left(\frac{\tilde{y}^i - y}{h}\right) - K\left(\frac{y^i - y}{h}\right)\right]$$

Where K is a Gaussian Kernel, h is the optimal bandwidth, and n the size of the sample. To estimate integral of (15), there was in use a numerical method (Simpson's rule).

Price-Wage Elasticities

The price-wage elasticities link the changes in prices of traded goods with the labor income of workers. Since there is no available price data at the individual level, these elasticities have to be estimated using variations in prices and household surveys, following Wolak (1996) and Deaton (1997).

The National Statistics Office of Argentina, INDEC, puts together the Permanent Household Survey (EPH), which is gathered in October and May. This survey is the main source of individual and household information, including income, employment and other relevant variables. One distinct feature that improves our estimation from previous ones is the use of a longer series, from 1995 to 2003 (two per year). Since the original estimation ranged from 1992 to 1998, our time window selection will inexorably affect the final results.[3] Price of exported and imported products was also retrieved from INDEC.

The relationship between prices and wages could be different for different types of labor, since wages, in turn, depend on skill intensities. We use then three types of labor: unskilled (primary education only), semi skilled (secondary education) and skilled (college education). Our econometric strategy therefore tries to capture the price-wage elasticities with the following specification.

$$(13) \qquad \log w^j = \alpha + \sum_g (E^j \log p_g^j)\beta_g + E^j\gamma + z^{j'}\delta + \mu^j$$

Where E^j is a vector of dummies for each type of labor, γ is a vector associated with the labor dummies, $z^{j'}$ is a vector of individual characteristics (age, age squared, genre, marital status), and $E^j\beta_g$ are the estimated price-wage elasticities. $\log p_g^j$ is the price of the traded good g, and μ^j the error term. This varying coefficient model by Hsiao (1986), uses international prices as regressors, therefore avoiding possible endogeneity problems. Standard errors were corrected to account for clustering by skill intensity, since all individuals face the same prices.

[3] However, we are confident that this selection is a more accurate portrait of the socio-economic status of the country, especially after a recession that started in 1998 and ended in 2002.

Table 1 reports the estimation of price-wage elasticities. Prices of exportable manufactures, impact positively on wages of all skills. In contrast, higher prices of primary goods exports cause wages to decline. Also, we find a positive effect of the prices of imported machines on wages of all skills, indicating some degree of substitution between labor and machines. Finally, higher prices in consumption and intermediate goods reduce wages.

During the nineties, and especially since 1996, Argentina increased substantially its trade with PRC. From 1990 to 2004, Argentina increased tenfold its exports to China, from US$ 240 million to US$ 2,600 million. Since the 2002 devaluation, Argentina doubled its sales to PRC. However, the composition of exports remained extremely concentrated, with soybeans (Primary goods) and soy oil (Agricultural Manufactures) accounting for 70%-80% of total exports to PRC. In the other hand, imports grew between 1990 and 2004 from US$ 12 million to US$ 1,400 million, after suffering a big slump with the devaluation of the argentine peso in 2002. In turn, Argentina's imports from China present a much more diversified pattern, where Electrical and Mechanical Machines (Capital Goods), Organic Chemicals (Intermediate Goods) and Toys (Consumer Goods) account for 50%-60% of total imports from PRC.

Table 2 exhibits the price responses of exported and imported goods to the elimination of tariffs in Argentina and PRC. Both countries show some fair degree of protection in each of those goods.[4] Argentina protects consumption goods the most, with an average MFN of 19.5%, while China does this with the Agricultural Manufactures. Given the importance of soybean exports to PRC, the price shock is highest in Primary Goods (2.84%), followed by Agricultural Manufactures (1.92%). The reduction in import prices, in contrast, is lead by the Consumption Goods (-1.93%). Since we are unable to calculate the passthrough coefficient to the domestic prices of exported goods, we focus on the tariff passthrough to domestic prices of imports.

2.4.2. Estimating Tariff Passthrough

In a recent review of the literature on trade, inequality and poverty, Goldberg and Pavnic (2004) point that Porto's (2003b) assumption of complete passtrough from trade policy to domestic prices may not be innocuous, as may have an important bearing on its predictions. In order to remedy this potential drawback of the model, we proceeded to econometrically estimate the tariff passtrough to prices.

To capture the effect of trade liberalization on domestic prices, we follow a model based on the scarce tariff passthrough literature, put forward by Feenstra (1989) and further developed by Nicita (2004). In that context, the equation to be estimated takes the following form:

$$(14) \qquad \ln P_{g,t} = \beta_0 + \beta_1 X_{g,t} + \beta_2 Z_{g,t} + \beta_3 \ln TC_{g,t} + \gamma \ln(1+\tau_{g,t}) + \varepsilon_{g,t}$$

[4] In order to account for the high non-tariff barriers in some sectors in PRC, we chose to include an average Ad Valorem Equivalent (AVE).

Where $X_{g,t}$ is a control variable which proxies for costs of production ($X_{g,t}$ is the international price of good *g* approximated by its average unit value, and expressed in domestic currency), while $Z_{g,t}$ is a proxy of the price of import competing goods (it includes local supply and regional income). $TC_{g,t}$ is a proxy for trade costs (it is the trade-weighted distance in miles to each trading partner), and finally, γ is the average passthrough for all imported goods.

Table 3 shows the main results for equation (14): the average passthrough to domestic prices of imports is equal to 0.76. It is noteworthy that this estimation must be taken as a reasonable approximation, since it is capturing the effects of a full unilateral liberalization, and not the effects of a FTA.

We assume then, that a 76% of the price change of imported goods is transmitted to the domestic price of imported goods. Also, we assume that the Great Buenos Aires Region is where prices are set. This allows us to introduce price variations at the regional level for the domestic price of imported goods.

Adding an Additional Dimension: Regional Effects

Since regional price data disaggregated by goods is unavailable for the Argentine case, our approach consists of calculating an average passthrough for each region. We then try to capture this effect using the variations of the aggregated CPI for each region, vis-à-vis the Great Buenos Aires region (GBA). The passthrough effect is twofold: 0.76 for the GBA Region, and a percentage of that for the other regions. This percentage is calculated by a simple OLS model using monthly CPI data from 1992 to 2004 for all regions. CPI series were retrieved from one representative province from each Region, assuming that regional prices move in a similar way.

Our estimation strategy is somewhat similar to Olarreaga and Nicita (2004). We regress the change in prices of each Region $\Delta P^r{}_t$, vis-à-vis the current and lagged change in prices in GBA Region, ΔP_t^{GBA} and ΔP_{t-1}^{GBA}. Thus the equation takes the following specification:

$$(15) \quad \Delta P^r{}_t = \beta_1^r D^r + \beta_{2,t}^r D^r \Delta P_t^{GBA} + \beta_{3,t}^r D^r \Delta P_{t-1}^{GBA}$$

We use a vector of dummies D^r to capture the effects of the passthrough in each region.
Estimation results are shown in Table 4. Regional passthrough ranges from 0.78 (Cuyo Region) to 0.95 (La Pampa Region). Total regional passthrough then, is the product of these coefficients and 0.76 (except for GBA).

2.5. Results

2.5.1. Poverty and Indigence

Tables 5 and 6 show the impact on poverty of a FTA with PRC. Poverty and indigence are reduced according to our post-FTA scenario. At the national level, poverty decreases by a –1.28%, while extreme poverty by a –0.87%. This, in terms of the Argentinean population base, is equivalent to more than 120,000 people leaving poverty and 31,000 leaving indigence. The regions that benefit the most from this are GBA and Northwest (NW), were reductions equaled to –1.36% and –1.24%. Given that GBA is the most populated region of Argentina (and where most poor people live), this small reduction in the poverty level, accounts for more than 50% of the people leaving poverty.

Figure 1 shows the estimated income density for all regions, previous and after the implementation of the FTA (dotted line is the counterfactual income after the FTA). The two vertical lines are the extreme poverty (leftmost) and poverty lines (rightmost), according to Table 7. These are expressed in equivalized income, accounting for the different household compositions (age, gender and number of persons per household). The poverty line reflects the amount of equivalized pesos that costs to purchase a basket comprising food, clothing, housing, etc. In contrast, the extreme poverty line only accounts for the cost of food.

However, poverty is not only measured by the headcount ratio. Other indicators such as the Foster-Greer-Thorbecke index (FGT) are useful to assess poverty effects.[5] The headcount ratio is not useful to assess the situation of those who remained poor. For that purpose, the FGT(1) is used. The Poverty Gap indicator, presented in Table 8, shows that according to our estimations, the people that remained poor are better off with the FTA.

2.5.2. Income distribution

The other variable of our interest is income distribution. In order to evaluate the impact of the FTA on inequality, a number of indexes were calculated with the estimated counterfactual income. Particularly, Gini and General Entropy indexes were used for this task.

According to our estimations, as Tables 9 and 10 show, the implementation of a FTA with has a pro-poor bias. A reduction in inequality is observed in each region, and in the country as a whole. This is probably one of the most remarkable and controversial results gathered from this paper, as theory would predict a pro-rich bias when a country liberalizes trade with PRC.

The percentile ratios, shown in Table 11, indicate that the poorest decile, while better off, is outperformed by the second and third poorest deciles. As the numbers point, the bulk of the reduction in inequality comes from middle-income households, whose

[5] For an explanation of the different indicators see Ravallion (1992)

wage increase is relatively higher. However, as Table 12 shows, inequality between regions is worse when the FTA is signed.

3. Trade and Employment in Argentina

Perhaps the phenomenon that has aroused more controversy amongst the public and expert opinion in Argentina on regards of an increased trade relationship with China is its potential impacts on employment, in particular in the industrial sector. This controversy, in turn, is part of a much broader debate on the effects of international trade on unemployment.

As a contribution to this ongoing debate, in this section we provide, firstly, a brief examination of the available statistical information as well as a review of the literature on the effects of trade on employment in Argentina. Secondly, we present the results of an econometric analysis aimed at measuring the incidence of trade opening, and trade with China in particular, on industrial employment.

3.1. A brief review of the literature for the Argentine case

The empirical evidence on the impacts of trade on employment in Argentina during the 1990s is far from being conclusive. In an early study, Márquez y Pages (1998), examined the relationship between trade and unemployment since the 1960s in Latin America and could not find any substantial effect. A comprehensive study of the IADB (2004), using household survey data for 10 Latin-American countries, including Argentina, could not find a statistically significant association between the two phenomena. In a similar work, that also contemplates the effects of exchange rate appreciations, Haltiwanger and others (2004), did not find robust results on regards the relationship between trade liberalization and changes in net employment in the region.

Particularly for the case of Argentina, Sanguinetti y Galiani (2003) only found a small correlation between trade opening and the rate of employment in the nineties. Pessino and Andres (2005), in turn, attribute the negative effects of trade liberalization on net employment more to the distortions and rigidities of the Argentine labor market institutions than to trade itself. Sánchez and Buttler (2002), points out to other explicative factors besides trade liberalization, such as labor costs, access to credit finance, financial and real shocks, informality, amongst the most important. Other studies, such as Altamir and Beccaria (1999), Beckerman (2000), and Damill, Frenkel and Mauricio (2002), in contrast, point out to the exchange rate appreciation combined with the accelerated process of trade liberalization as the main culprit of the net loss of employment suffered by the Argentine industry over the period.

In sum, the evidence presented in the studies on the trade and employment for the case of Argentina is far from being conclusive and the matter seems to be still an open debate.

3.2. Some stylized facts

Beyond the controversies of the debate, it is possible to describe some stylized facts of the evolution of industrial employment and the process of trade liberalization for 1991-2003. This description will provide the background for our posterior econometric analysis of the impact of international trade, and trade with China in particular, on Argentina's industrial employment.

3.2.1. Trade liberalization and industrial employment

Figure 2 illustrates one of the key features of the period: a continuous reduction in the employment levels in the Argentine industrial sector. Between 1991 and 2002, industrial employment fell by almost 40%. Losses in industrial employment were only partially compensated by an increased in employment in the services sector. The net effect on overall employment was negative; that reflected in two-digits unemployment rates over most of the period. Only from 2003 on, employment in the industry has experienced a nuance recovery.

All manufacturing sectors exhibited a tendency to reduce its labor force but natural resources-intensive sub-sectors such as foodstuff and beverages did so in a minor proportion. In parallel to these steep job losses, the aggregate productivity of the industrial sector, exhibited an average increase of 6.8% for 1991-1999. Productivity increased the most in capital-intensive sub-sectors such as iron and steel, electric machinery and transport equipment and the least in natural resources and labor-intensive sub-sectors.[6]

In parallel to these changes in the level and composition of industrial employment, Argentina experienced a deep and accelerated process of trade liberalization[7]. The trade-opening (exports plus imports) coefficient as percent of the GDP went from 6% in 1993 to 23.4% in 2001, falling to 21.7% in 2003 as a result of the peso depreciation in 2002. Imports as percent of the GDP increased from 9% in 1990 to 11% in 2001, and fall to 8% in 2003. Exports as percent of the GDP augmented from 7% to 12% over the period[8].

Nonetheless, as we observe in Figure 3, trade penetration varied significantly across manufacturing sub-sectors in the nineties. For capital-intensive sectors such as electric and non-electric machinery, transport equipment, professional and scientific instruments, and other manufactures, import penetration was far superior to the manufacturing industry media. Some labor-intensive sectors such as shoes also experienced a significant increase in imports' competition. However it is not possible to determine from these simple figures whether the sub-sectors with the highest import penetration coefficients were the ones suffering the highest reductions in employment.

In order to measure more rigoursly whether the increase in import competition was associated with a destruction or creation of employment in the manufacturing sector,

[6] For a comprehensive analysis of the changes in the Argentine industrial employment see Altimir and Beccaria (1999), and Beccaria, Altimir and Gonzalez Rosada (2003). Dussel Peters (2004) offers a comparative analysis with Mexico and Brazil..
[7] See Berlinski (2004) for a detailed account of the Argentine trade liberalization process in the 1990s.
[8] These indicators were calculated with data retrieved from ECLAC (2004)

we calculated in Table 13 a simple correlation coefficient between the employment rate and the import penetration coefficient across sub-sectors and time.

The results presented above suggest that the increase in imports penetration was not associated on average with a significant process of employment destruction in the manufacturing sector of Argentina in the 1990s[9]. These results must be taken with caution, however, as they are only simple correlations that do not control by other factors' influence –as macroeconomic phenomena and policy or reforms to the labor market institutions – on industrial employment. In addition, they do not allow to explore the dynamic effects of trade liberalization, that is, how trade integration impinges on the employment rate over time; in the understanding that labor market adjustments are not automatic but only take place gradually[10]. In order to conduct such an analysis is required an econometric methodology that allows us to investigate the effects of trade liberalization controlling for these additional variables. In the next section, we present the results of such an empirical analysis with particular attention to the case of trade with the PRC.

3.2.2. Trade with the PRC and changes in manufacturing employment

Significant trade with China is a relatively new experience for Argentina. Figure 4 shows the import penetration coefficient distinguishing by sourcing country. As can be observed there, imports from the PRC have only become a relevant share of the total import coefficient of Argentina since the mid-1990s. This already small share of Chinese imports declined severely as a result of Argentina's economic collapse in 2001 and only slightly recovered in 2003.

Beyond these aggregate trends, it is important to know what happened at the sectoral level. Table 14 shows information on PRC import penetration and exports to the PRC for 28 sub-sectors of the Argentine manufacturing industries between 1990 and 2003. Chinese imports penetration is concentrated in a few sectors, mostly capital-intensive, such as electric and non-electric machinery, scientific and professional instruments and other manufactures. These sub-sectors, as we showed in the previous section, are the ones facing more competition from imports from all sources not only from China. Some labor intensive sectors as shoes and clothing also faced relatively higher import competition from China. In a similar manner, Argentine exports penetration to the PRC was also concentrated in a few sectors such as food, leather products and iron and steel.

3.3. Trade with the PRC and industrial employment

The stylized facts presented above and the existing literature for the Argentine case seem to suggest that increased integration to international trade flows had only a minor influence on the changes occurred to employment in the Argentine manufacturing industry in the last decade. Other factors such as changes in sectoral

[9] Sanguinetti and Galiani (2003) reach similar results.

[10] For instance, the presence of annual collective wage-setting mechanisms introduces a certain lag in the transmission of trade shocks –and other shocks- to wages. Laws and norms that regulate the firing and hiring of workers also retard the impact of these shocks on the employment rate.

productivity, real exchange rate fluctuations, business cycles and labor market institutions seem to have a more important bearing on the sheer decline in manufacturing employment exhibited by Argentina over the period.

In this section, we present the results of a dynamic econometric analysis that uses panel data for 28 industrial sub-sectors from ECLACs' PADI database to measure the impact of trade liberalization in general, and trade with the PRC in particular, on the sectoral and aggregate employment of the Argentine manufacturing industry for 1989-2003.

Our econometric methodology was originally developed by Greenaway, Hine and Wright (1998) for the United Kingdom and has been adapted here to fit the peculiarities of the Argentine employment and production data. This methodology permits to quantify the changes in industrial employment resulting from a more efficient utilization of labor as result of an intensified import competition. It also allows capturing the dynamic effects of gradual adjustment over time of the rate of industrial employment to changes in the import and exporting penetration coefficients.

3.3.1. The model

As we detailed in the next section our econometric approach is based on a dynamic model of labor demand that permits to quantify job losses deriving from a more efficient use of labor.

Following Greenway et. al. (1998), we assume a Cobb-Douglas production function for a representative firm *i* in time *t*:

$$q_{it} = A^{\gamma} k_{it}^{\alpha} l_{it}^{\beta} \qquad (1)$$

where q is gross real production, k is capital stock and l units of labor utilized, and where α and β are the share of each factor used in production. Firms demand labor and capital until the marginal benefit of labor is equal to the cost of labor. (w) and the marginal benefit of capital is equal to the interest rate (c). Solving this system of equations for the firm's production to eliminate capital from the equation yields the following expression:

$$q_{it} = A^{\gamma} \left(\frac{\alpha L_{it}}{\beta} \cdot \frac{w_i}{c} \right)^{\alpha} l_{it}^{\ \beta} \qquad (2)$$

Using logarithms and rearranging equation (2), we obtain the derived labor demand for the firm and thus the industry:

$$\ln l_{it} = \phi_0 + \phi_1 \ln\left(w_i / c \right) + \phi_3 \ln q_{it} \qquad (3)$$

where $\phi_0 = -(\gamma \ln A + \alpha \ln \alpha - \alpha \ln \beta)/(\alpha + \beta)$; and, $\phi_1 = -\alpha/(\alpha + \beta)$; and $\phi_2 = 1/(\alpha + \beta)$

Assuming the technological efficiency of the production process increases over time and the rate of technological change is correlated with the changes in trade flows, we assume that the parameter *A* in the production function changes in the following way:

$$A_{it} = e^{\delta_0 T_I} M_{it}^{\delta_1} X_{it}^{\delta_2}, \delta_0, \delta_1, \delta_2 > 0 \qquad (4)$$

where *t* is a time trend, *M* is the import penetration coefficient y *X* is the export penetration coefficient. This allows us to rewrite equation (3) as:

$$\ln l_{it} = \phi_0^* - \mu_0 T - \mu_1 \ln M_{it} - \mu_2 \ln X_{it} + \phi_1 \ln\left(w_i / c\right) + \phi_2 \ln q_{it} \qquad (5)$$

where $\phi_0^* = -(\alpha \ln \alpha - \alpha \ln \beta)/(\alpha + \beta)$; $\eta_0 = \eta\delta_0$; $\eta_1 = \eta\delta_1$; $\eta_2 = \eta\delta_2$; y $\eta = \gamma/(\alpha + \beta)$

3.3.2. Data

The PADI Database comprises production, employment and wages for the 28 ISIC Rev.2 3-digit industrial sectors. Since the series stops in 1998, updating became the only solution in order to come up with a longer dataset. This was done with more recent data not available in electronic format, from two Argentine official statistical and research agencies *Instituto Nacional de Estadisticas y Censos* (INDEC) and *Centro de Estudios de la Produccion (CEP)*. Specifically, an hourly wage index, a production index and an employment index were used to update all sectors. Trade data came from COMTRADE (2004).

One problem common to all studies using the ISIC classification lies in the arrangement of industries within each chapter or subheading. In this case, some industries particularly vulnerable to Chinese imports, such as toys, bycicles, etc, are included in catch-all categories, presenting additional problems to isolate the potential effects of higher imports on employment. The other problem is the lack of public and reliable firm surveys for Argentina. This allows us only to work with industry aggregates, as opposed to other studies that are able to setup up firm level panels.

3.3.3. Econometric Strategy

The selection of our econometric strategy was dictated by the statistical information available, in this case, the PADI database of ECLAC that contains data on employment, production, wages and productivity at the industry level (three digits of the ISIC classification, as mentioned above) for the 1970-1990 period, updated until 2003 with data from INDEC.

The wealth of this statistical information permitted us to utilize a dynamic panel data methodology. Following Fajnzylber and Maloney (2001) and Greenway et.al (1998) we commenced from the following specification,

$$l_{it} = \mu_0 T - \sum_j \mu_{1j} \ln M_{i,t-j} - \sum_j \mu_{2j} \ln X_{i,t-j} + \sum_j \phi_{0j} \ln l_{i,t-j} + \sum_j \phi_{ij} \ln w_{i,t-j} + \sum_j \phi_{2j} \ln Q_{i,t-j} + \theta_t + \theta_i + \varepsilon_{it} \qquad (5)$$

where l is employment, w wages, q is gross sectoral production, θ_t and θ_i are fixed effects for year and industry respectively and ε_{it} is an error term. The index i and t denote industry and time. All the variables are expressed as logarithms, thus the η coefficients are the relevant elasticities.

In order to correct potential heteroesquedacity and serial correlation problems, we used first differences of each variable, eliminating the time error term μ_i in the following way,

$$\Delta l_{it} = \eta_l \Delta l_{i(t-1)} + \sum_{j=0}^{n} \eta_{w(t-j)} \Delta w_{i(t-j)} + \sum_{j=0}^{n} \eta_{q(t-j)} \Delta q_{i(t-j)} + + \mu_t + \varepsilon_{it} \quad (2)$$

where Δ is a time-difference operator. This differentiation gives necessarily an error term transform in a MA(n) structure that is correlated with the lagged and differenced dependent variable. This problem was solved including additional lagged variables as instruments in order to enhance the efficiency of the estimates, in what is called a Generalized Methods of Moments (GMM)[11]. Estimations were carried out using three different specifications: GMM in levels, GMM in differences and systemic GMM (that combines levels and differences). Our preferred specification is the last one, thus results always refer to it.

Finally, following Bernard, Jensen and Schott (2003), an indicator of transportation costs was introduced as an instrument to control for potential correlation problems between the trade variables –specifically, imports from different origins-. Here, transport costs are proxied by the distance in miles to each partner. This, in turn, is weighted by the period's average trade weight.

3.3.4. The results

The econometric analysis presented here examines firstly the relationship between international trade –measured by changes in the total import and export penetration coefficients[12]- and changes in industrial employment controlling for other variables. Secondly, the effects of trade with the PRC are examined.

3.3.4.1. Total trade

In equation (1) Table 15, shows that, consistent with the results of studies for other countries[13], an increase in production has a positive effect on labor demand whereas a rise in wages has a negative impact but that operates with some lag. That is, raising

[11] See Arellano and Bond (1991) for a detailed description of the GMM technique.

[12] The import penetration coefficient was calculated for each industry as the share of total imports on total production minus exports. For exports, the coefficient was calculated as the share of total exports on total sectoral production. All the variables we converted to 1985 US dollars.

[13] Hamermesh (2004) provides an excellent summary of the main results of the existing econometric studies on trade and changes in the derived labor demand.

production levels induces an expansion in the demand for labor and increasing cost or price of labor – the wage or salary- induces a fall in it. Results presented in equation (3) suggest that import penetration had a negative and lagged effect on labor demand, as only the second lag is statistically significant. This seems to imply that firms reduced gradually their demand for labor in response to a higher import competition. In a similar fashion, exports penetration –portrayed in equation (2)- had a positive and lagged effect, suggesting a similarly gradual adjustment of firms' production and employment to the new opportunities open in foreign markets.

Inclusion of control variables such as the business cycle and multilateral real exchange rate (MRER) in equations (4) y (5) respectively, altered neither the sign nor the dimension of the relevant coefficients. Only the MRER was significant, suggesting that the business cycle could be correlated with other independent variables like production changes. The Sargan and autocorrelation tests yielded better results when including the control variables.

3.3.4.2. Trade with the PRC

As the factor proportion theory emphasizes, one should expect that imported goods coming from the PRC will have a different effect on industrial employment than imports coming from, let say, the United States. If the pattern of trade is determine by countries' factor endowments, trade with the PRC should induce a relocation of output and employment away from the low-skilled and labor-intensive industries and towards medium/high skilled and natural resources intensive industrial activities where Argentine has a relative comparative advantage. This effect will mediated by the flexibility of labor markets and an ample variety of macro and microeconomic factors, thus it is difficult to anticipate what it will the net effect on employment.

More importantly, is the fact that not all the goods imported from the PRC compete with locally produced products. For instance, imported inputs and raw materials such as parts and components are complements for domestic production. Low price imports from the PRC of these goods will reduce local firms' production costs for final goods, increasing their productivity and inducing in turn a reduction in labor demand. However, in parallel increased exports to the PRC will permit to expand production, inducing the creation of new jobs that could potentially compensate the job losses resulting from increased productivity levels. In sum, to determine what was the effect of Chinese imports in the Argentine manufacturing employment remains mostly an empirical matter.

Table 16 reports the results for trade with the RPC between 1990 and 2003 of our econometric analysis. It can be observed, firstly, in equation (1) that production and wages coefficients signs are consistent with the ones obtained in table 17 for total trade, and statistically significant as measured by its P-value.

Whereas imports from Brazil had a contemporaneous and negative but statistically significant effect –equation (4)-, imports from the US had a negative impact that affected manufacturing employment over the long run –equation (3)-. This latter effect, however, seem to dissipate when including some control variables, suggesting that it is not particularly important. Imports from China seem to have a very small

negative effect that operated also with some lag over time.[14]. This effect also disappears when control variables are included.

As import penetration varies significantly across sectors, we introduced a time variant variable that, following Kletzer (2001), differentiates between high, medium and low import penetration. The results do not permit to obtain firm conclusions as the coefficients were quite low and similar across import penetration levels and none of them were significant.

With respect to exports by destination, exports to Brazil appear to have a positive but lagged effect on the changes in manufacturing employment. However, this effect disappears when control variables are included, suggesting that it is also not particularly significant. Exports to the PRC seem to also have a positive effect but small; it coefficient is not significant for any of the regressions or lags. Exports to the US did not have any effect on manufacturing employment, as the coefficient is also not statistically significant in any cases.

Bernard et. al. (2003) find for the US that capital-intensive firms are less prone to be negatively affected by low-wages imports competition in the form of reduced production and employment. To test this result for Argentina, we included in the regressions a variable that measures capital intensity. This is only a proxy variable as it was constructed using gross capital investment and not capital stock data that was unavailable at the industry level. Our results do not support the hypothesis that firms with a higher capital intensity suffer fewer losses in employment. The coefficient has not the expected sign and is not statistically significant[15].

As Argentina underwent a process of structural reforms as well as major macroeconomic imbalances over the period, we test for structural breaks in the data introducing time-dummies. The results were disappointing, as we could not find any significant effects. Corresponding coefficients were low and not statistically significant[16]. Only two years, 1997 and 2003, reported positive coefficients. A close examination of the employment trends for those years reveals that they were the only ones when employment increased over the period.

One important caveat worth mentioning is the absence of reliable and consistent time-series of labor reform indicators for countries like Argentina. This in fact, could affect our results since labor market rigidities do affect employment outcomes and adjustment to sudden changes in relative prices. The use of other proxies to try to isolate these effects was considered but turned down due to its lack of specificity. Thus, the inclusion of labor market rigidities indicators to this sort of exercises should be kept in the agenda for further research.

[14] These results are similar to the results obtained by Greenaway et.al (1998) for the United Kingdom and Freeman and Revenga (1999) for the United States: imports sourced in developed countries seem to have a larger (negative) impact on manufacturing employment than imports from low-wage countries in this case the PRC. Bernard et. al. (2003), however, find the opposite effect in their study for the United States manufacturing industry.

[15] Results are not displayed here but can be provided upon request.

[16] The authors upon request can provide the results of these regressions that are not shown here.

4. Conclusions

Imports from the PRC increased exponentially in the 1990s for Argentina. Some labor and capital-intensive manufacturing sub-sectors, in particular, faced soaring Chinese import competition. This paper considers the role of trade with the PRC in the Argentine manufacturing employment outcomes over the period. It also examines the likely effects that a FTA between the PRC and Mercosur might have on poverty and income distribution in Argentina.

We find that total import penetration had a small negative and lagged effect on industrial employment in Argentina over the nineties. This seems to suggest that manufacturing firms reduced only gradually their demand for labor in response to a higher import competition. Similarly, total exports penetration had a positive and lagged effect, suggesting a correspondingly slow adjustment of firms' production and labor demand to new exporting opportunities. Regarding imports by country of origin, we find whereas imports from Brazil had a contemporaneous negative effect, imports from the US had a negative impact that only affected manufacturing employment in the long run. Imports from the PRC seem to have only a very small negative effect that operated also with some lag over time. Nonetheless, these negative effects of import competition dissipate when the role of the business cycles and the real exchange rate fluctuations was taken into account in the estimations. In consistency with previous studies, this seem to suggest that trade would only had a minor role in explaining the outcomes of industrial employment vis-à-vis other economic phenomena in Argentina in the 1990s. Similar results were obtained for exports penetration by destination, with only exports to Brazil exhibiting a positive but lagged effect on manufacturing employment. However, this effect also fades away when control variables were included, suggesting that it is not particularly important.

Using a model of micro-simulation based on household surveys, we find that an FTA with the PRC would result for Argentina in a small reduction in poverty throughout the country, as well as a reduction in inequality. However, inter-regional income distribution would worsen up as a result of the FTA. Our findings also point to the importance of including econometrically estimated passtrough of tariff changes on domestic prices when ex-ante evaluations of trade reforms such as a FTA are carried out using micro-simulation models. They also indicate the importance of including the regional dimension in the estimation as the effects of tariffs changes on local prices vary significantly across regions in Argentina.

This paper only begins to examine the role of increased trade with a low-wage country, the PRC, on manufacturing industry employment in a developing country such as Argentina. To the extent the literature has largely ignored the potential implications of trading with the PRC and other low-wage countries for non-developed economies, additional theoretical and empirical work is required, opening a very interesting new avenue for further research.

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Tables and Figures

Table 1: Poverty Effects. Price-Wage Elasticities

		Skill Intensities		
Exported / Imported	**Good**	**Unskilled**	**Semi-Skilled**	**Skilled**
	Agricultural Manufactures	1.423 (3.97)	1.4 (3.85)	0.607 (1.07)
Exported	Industrial Manufactures	1.399 (3.17)	1.355 (3.60)	1.529 (2.93)
	Primary Goods	-0.822 (-4.56)	-0.906 (-4.52)	-0.442 (-1.37)
	Capital Goods	2.242 (3.75)	2.531 (4.50)	3.064 (4.23)
Imported	Consumption Goods	-3.103 (-3.39)	-2.778 (-3.00)	-2.498 (-2.56)
	Intermediate Goods	-2.389 (-4.14)	-2.553 (-4.45)	-2.061 (-3.29)

Note: P-values in parenthesis. Dummy coefficients were not reported

Table 2: Price Changes of Traded Goods

Exported/ Imported	**Good**	**Average Tariffs (%) 2003**		**China's Share in Exports/Imports**	**Price Change (%)**
		Argentina (MFN)	**China (AVE)**		
Exported	Agricultural Manufactures	11.2	**18.7**	10.3	1.92
	Industrial Manufactures	15.3	**14.6**	2.4	0.35
	Primary Goods	6.0	**14.8**	19.2	2.84
Imported	Capital Goods	**13.3**	8.9	6.7	-0.89
	Consumption Goods	**19.5**	17.1	9.9	-1.93
	Intermediate Goods	**11.7**	9.4	4.1	-0.48

Sources: Tariffs (Trains Database) ; Exports and Imports (UN COMTRADE)

Table 3: Estimation of Passthrough to Domestic Prices of Imports

Dependent Variable: Ln $P_{g,t}$

	Coefficient	Std.Error	T-stat	P-value
Bo	5.061	0.701	7.22	0.00
B1	0.017	0.011	1.62	0.11
B2	0.364	0.054	6.79	0.00
B3	-0.084	0.076	-1.1	0.27
Gamma	0.766	0.436	1.76	0.08

No. Of Obs	117		
Random effects u_i ~ Gaussian		Wald chi2(4)	= 76.58
corr(u_i, X) = 0 (assumed)		Prob > chi2	= 0.0000

R-sq: within = 0.6611
between = 0.0805
Overall = 0.1803

Table 4: Regional Passthrough Coefficient

Dependent Variable Difprecio

	Coefficient	Std.Error	T-stat	P-value
LA PAMPA	-0.002	0.001	-2.66	0.01
NW	-0.001	0.001	-1.6	0.11
NE	0.000	0.001	-0.6	0.55
CUYO	0.000	0.001	-0.46	0.65
PATAGONIA	-0.003	0.001	-3.85	0.00
LA PAMPA				
--	0.949	0.081	11.78	0.00
L1	0.465	0.092	5.06	0.00
L2	0.016	0.080	0.2	0.84
NW				
--	0.924	0.081	11.46	0.00
L1	0.164	0.092	1.79	0.07
L2	0.254	0.080	3.18	0.00
NE				
--	0.888	0.081	11.02	0.00
L1	0.132	0.092	1.44	0.15
L2	-0.023	0.080	-0.28	0.78
CUYO				
--	0.786	0.081	9.74	0.00
L1	0.220	0.092	2.39	0.02
L2	0.118	0.080	1.47	0.14
PATAGONIA				
--	0.801	0.081	9.93	0.00
L1	0.436	0.092	4.75	0.00
L2	0.342	0.080	4.27	0.00

Source	SS		Number of obs	750
			F(20, 730)	120.3
Model	0.154034096		Prob > F	0
Residual	0.046735453		R-squared	0.7672
			Adj R-squared	0.7608
Total	0.200769549		Root MSE	0.008

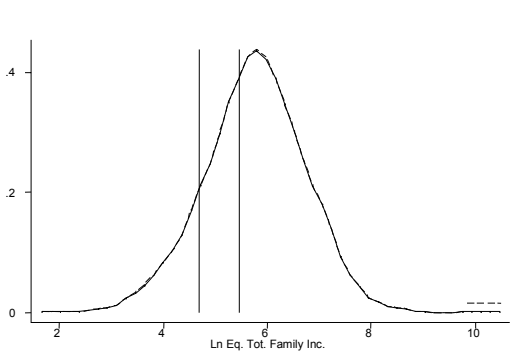
Table 5: Impact in Poverty by Region

Region	Second Semester 2004			After FTA		
	Sample Population (I)	Number of Poor (II)	Headcount (III) = (II) / (I)	Chg. Number of Poor	Number of Poor (IV)	Headcount (% Chg)
GBA	12,600,000	4,758,296	37.8%	-64,732	4,693,564	-1.36%
NW	2,268,676	1,211,924	53.4%	-15,023	1,196,901	-1.24%
NE	1,182,813	703,264	59.5%	-8,433	694,831	-1.20%
Cuyo	1,482,827	614,065	41.4%	-7,329	606,736	-1.19%
La Pampa	5,272,836	1,969,610	37.4%	-23,923	1,945,687	-1.21%
Patagonia	571,147	141,293	24.7%	-1,275	140,018	-0.90%
Country Total	23,378,299	9,398,452	40.2%	-120,715	9,398,452	-1.28%

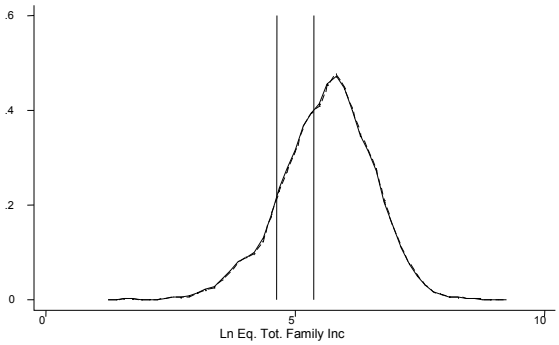
Table 6: Impact in Indigence (Extreme Poverty) by Region

Region	Second Semester 2004			After FTA		
	Sample Population (I)	Number of Indigents (II)	Headcount (III) = (II) / (I)	Chg. Number of Indigents	Number of Poor (IV)	Headcount (% Chg)
GBA	12,600,000	1,761,179	14.0%	-13,196	1,747,983	-0.75%
NW	2,268,676	485,397	21.4%	-5,613	479,784	-1.16%
NE	1,182,813	310,449	26.2%	-4,588	305,861	-1.48%
Cuyo	1,482,827	211,116	14.2%	-1,418	209,698	-0.67%
La Pampa	5,272,836	696,261	13.2%	-5,508	690,753	-0.79%
Patagonia	571,147	50,733	8.9%	-173	50,560	-0.34%
Country	23,378,299	3,515,135	15.0%	-30,495	3,515,135	-0.87%

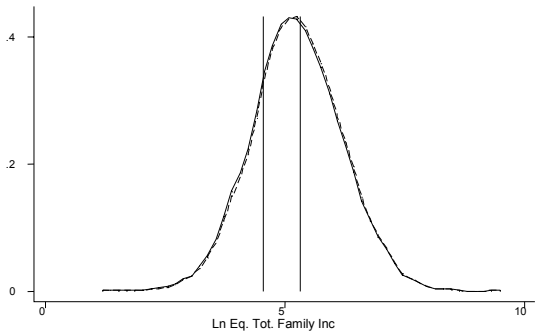
Figure 1: Regional Estimated Income Density



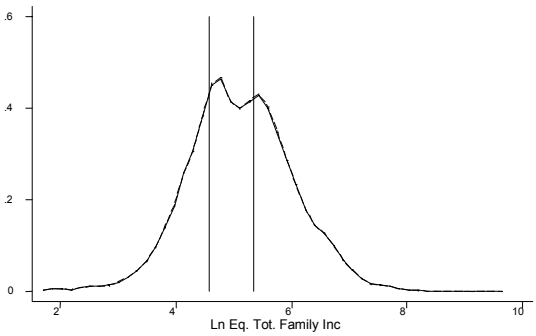
GBA



La Pampa



NW



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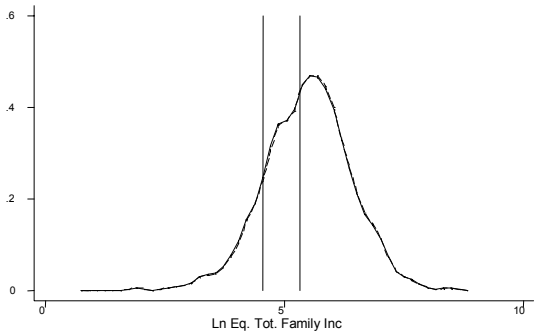
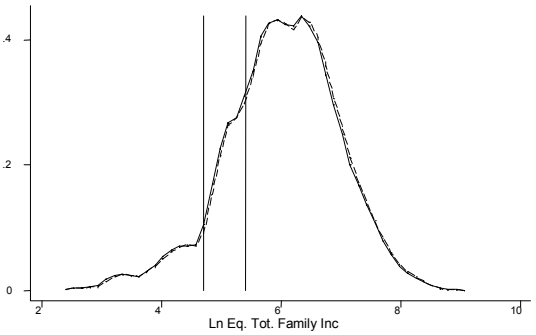


CUYO



PATAGONIA

Table 7: Poverty and Indigence (Extreme Poverty) Line, in Equivalized Pesos

Region	Poverty Line	Extreme Poverty Line
GBA	237.2	107.9
La Pampa	214.6	101.8
NW	205.3	94.9
NE	210.3	96.9
Cuyo	207.0	96.3
Patagonia	225.4	111.7

Source: INDEC

Table 8: FGT Poverty Indexes

Region	FGT(1) – Poverty Gap		FGT(2) – Severity of Poverty	
	II Semester 2004	After FTA	II Semester 2004	After FTA
GBA	0.159	0.153	0.092	0.089
La Pampa	0.155	0.150	0.089	0.085
NW	0.254	0.248	0.152	0.147
NE	0.292	0.283	0.175	0.169
Cuyo	0.177	0.171	0.099	0.096
Patagonia	0.096	0.092	0.053	0.051

Table 9: Income Distribution Indicators, Entire Country

Indicator	II Semester 2004	After FTA
GE(2)	1.1871	1.1705
Gini	0.5042	0.5033

Table 10: Income Distribution Indicators, by Region

Región	GE(2)		Gini	
	II Semester 2004	After FTA	II Semester 2004	After FTA
GBA	1.364	1.349	0.511	0.510
NW	0.981	0.973	0.505	0.504
NE	0.923	0.917	0.484	0.483
Cuyo	0.619	0.613	0.464	0.462
La Pampa	0.553	0.548	0.458	0.457
Patagonia	0.489	0.486	0.462	0.461

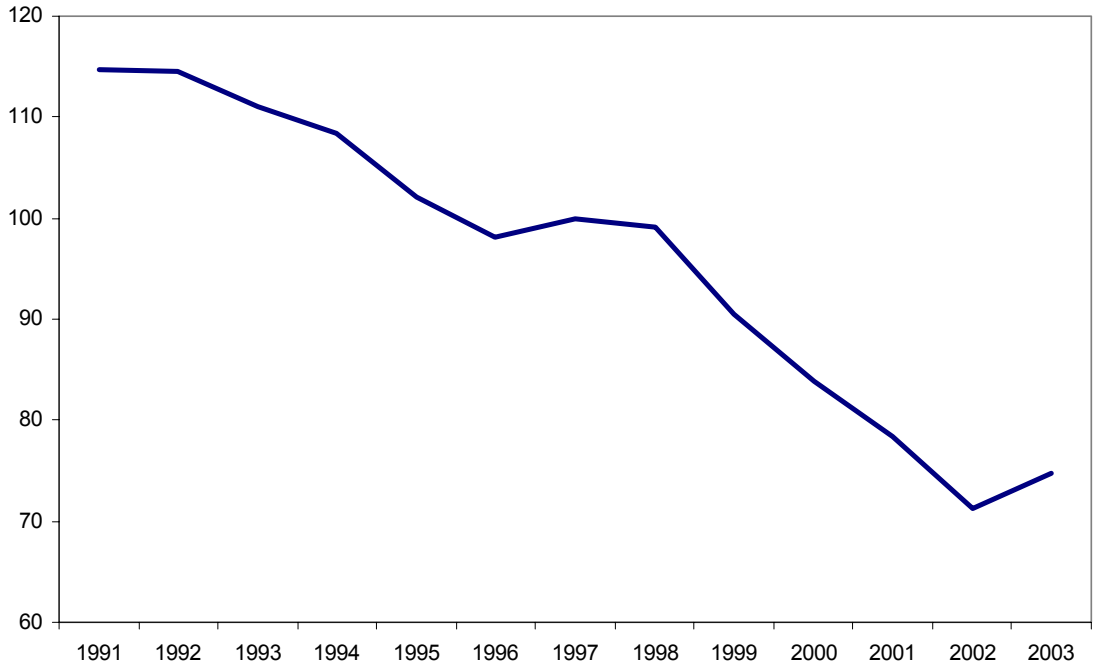
Table 11: Percentile Ratios

	d90/d10	d90/d50	d10/d50	q75/q25	q75/q50	q25/q50
II Semester 2004	11.616	3.286	0.283	3.583	1.843	0.514
After FTA	11.735	3.261	0.278	3.545	1.837	0.518

Table 12: Between-Region Inequality

	Between-Region	
	II Semester 2004	After FTA
GE(2)	0.0190	0.0192

Figure 2: Industrial Employment, 1991-2003 (Index 1997=100)



Sources: Own calculations based on ECLAC-PADI (2003) and UN COMTRADE (2004)

Table 13: Import penetration coefficient in the manufacturing industry

Sector	Import Penetration Coefficient		Unemployment
	80-89	90-99	91-03
Foods	1.0	4.6	-2.0
Beverages	0.8	2.3	-4.2
Tobacco	0.2	0.1	-6.2
Textiles	1.8	9.5	-4.9
Apparel	1.6	9.3	-6.5
Leather Products	0.4	5.0	-6.6
Footwear	1.0	**17.3**	-2.4
Wooden Products	8.9	**17.9**	-2.1
Furniture	0.2	7.8	-1.2
Paper	9.4	**22.1**	-4.3
Printing and Publications	1.6	5.9	-0.8
Chemical Products	25.4	**46.7**	-3.8
Other Chemicals	5.7	15.5	-1.6
Oil Refineries	1.3	2.4	-10.3
Oil and Coal Products	6.7	8.1	-6.4
Rubber Products	4.7	21.9	-2.5
Plastic Products	3.1	21.8	-0.7
Ceramic Products	1.7	4.4	-5.6
Glass	4.8	17.5	-6.5
Other Non Metalic Minerals	3.3	3.1	-4.0
Iron and Steel	12.8	10.9	-5.5
Non Ferrous Metals	17.9	**28.7**	-4.2
Metal Products	4.0	13.5	-2.2
Non Electric Machinery	36.1	**167.7**	-4.0
Electric Machinery	28.7	**69.5**	-4.7
Transport Equipment	10.2	**29.2**	-1.2
Scientific and Professional Equipment	77.9	**251.3**	-5.9
Other Manufactures	31.5	**231.5**	-1.4
Total Manufactures	***8.7***	***20.6***	**-3.2**

Sources: Own calculations based on ECLAC-PADI (2003) and UN COMTRADE (2004)

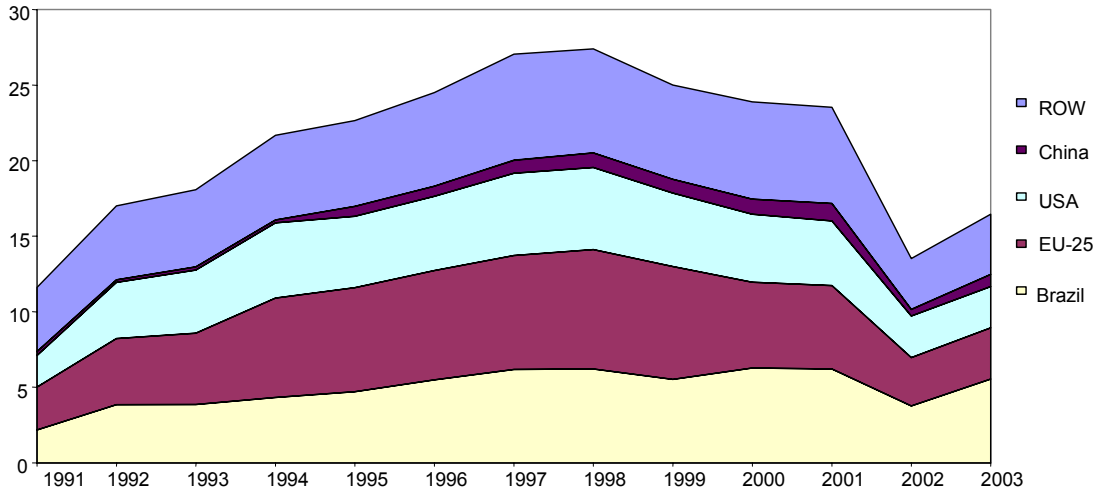
Table 14: Import penetration and employment rate.

Correlation coefficients

Period	Import Penetration Coefficient	Export Penetration Coefficient
90-99	-0.04	0.21

Sources: Own calculations based on ECLAC-PADI (2003) and UN COMTRADE (2004)

Figure 3: Import Penetration Coefficient by sourcing country



Sources: Own calculations based on PADI (2003) and UN COMTRADE (2004)

Table 15: Chinese Imports Penetration Coefficient and Export Penetration Coefficient in China

Sector	Chinese Imports Penetration Coefficient			Argentinean Export Penetration Coefficient in China		
	80-89	90-99	00-03	80-89	90-99	00-03
Foods	0.0	0.0	0.0	0.3	**1.2**	**2.0**
Beverages	0.0	0.0	0.0	0.0	0.0	0.0
Tobacco	0.0	0.0	0.0	0.0	0.0	0.0
Textiles	0.1	0.5	0.4	0.5	0.4	1.0
Apparel	0.0	**1.8**	1.6	0.0	0.0	0.1
Leather Products	0.0	**1.8**	**2.5**	0.5	**2.3**	**8.5**
Footwear	0.0	**3.1**	**1.4**	0.0	0.0	0.0
Wooden Products	0.0	0.2	0.2	0.0	0.0	0.2
Furniture	0.0	0.2	0.5	0.0	0.0	0.0
Paper	0.0	0.0	0.0	0.0	0.0	0.5
Printing and Publications	0.0	0.1	0.2	0.0	0.0	0.0
Chemical Products	0.1	0.7	1.4	0.3	0.1	0.3
Other Chemicals	0.0	0.2	0.2	0.0	0.0	0.1
Oil Refineries	0.0	0.0	0.0	0.0	0.0	0.0
Oil and Coal Products	0.0	0.0	0.0	0.0	0.0	0.0
Rubber Products	0.0	0.3	0.7	0.0	0.0	0.0
Plastic Products	0.0	1.7	1.5	0.0	0.0	0.0
Ceramic Products	0.1	1.0	1.1	0.0	0.0	0.0
Glass	0.0	0.4	0.8	0.0	0.0	0.0
Other Non Metalic Minerals	0.0	0.0	0.1	0.0	0.0	0.0
Iron and Steel	0.0	0.1	0.2	2.3	**1.3**	**1.9**
Non Ferrous Metals	0.0	0.1	0.4	0.8	0.2	0.7
Metal Products	0.0	0.7	1.1	0.0	0.0	0.0
Non Electric Machinery	0.0	**3.1**	**9.6**	0.1	0.1	0.3
Electric Machinery	0.0	**2.8**	**4.8**	0.0	0.0	0.0
Transport Equipment	0.0	0.2	0.4	0.0	0.0	0.0
Scientific and Professional Equipment	0.3	**8.3**	**18.4**	0.0	0.0	1.1
Other Manufactures	0.8	**40.5**	**67.4**	0.0	0.0	0.0
Total Manufactures	*0.0*	*0.5*	*0.8*	*0.4*	*0.4*	*1.5*

Sources: Own calculations based on ECLAC-PADI (2003) and UN COMTRADE (2004)

Table 16: Changes in trade penetration and employment rate in the manufacturing industry

Dependent Variable: Ln (Employment$_t$) - Log (Employement$_{t-1}$)

		Equation															
		1		2		3		4		5		6		7		8	
		Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Constant		-0.039	0.000	-0.038	0.000	-0.032	0.000	-0.388	0.366	-0.461	0.280	-0.004	0.701	-0.029	0.395	-0.404	0.444
Ln (Employ)	LD	0.000	0.995	-0.008	0.933	-0.011	0.920	-0.036	0.753	-0.083	0.479	0.039	0.866	0.022	0.866	0.003	0.985
Ln (Employ)	L2D	0.006	0.950	-0.004	0.967	0.050	0.601	0.020	0.847	0.053	0.610	-0.007	0.628	0.053	0.628	0.037	0.745
Ln (Wages)	D1	0.046	0.332	0.051	0.300	-0.123	0.126	-0.137	0.095	-0.156	0.058	0.019	0.942	-0.008	0.942	-0.035	0.885
Ln (Wages)	LD	-0.145	0.002	-0.141	0.005	-0.135	0.039	-0.127	0.054	-0.161	0.017	-0.042	0.366	-0.060	0.366	-0.282	0.180
Ln (Wages)	L2D	0.010	0.716	0.023	0.411	-0.005	0.863	-0.003	0.909	-0.010	0.714	0.009	0.932	0.003	0.932	-0.406	0.127
Ln (Production)	D1	0.268	0.000	0.270	0.000	0.225	0.000	0.225	0.000	0.217	0.000	0.136	0.002	0.147	0.002	0.193	0.000
Ln (Production)	L1	0.136	0.000	0.145	0.000	0.103	0.011	0.104	0.010	0.112	0.005	0.091	0.017	0.103	0.017	0.094	0.063
Ln (Production)	L2	0.001	0.965	0.003	0.902	0.018	0.507	0.022	0.418	0.023	0.402	0.032	0.286	0.030	0.286	0.026	0.417
Ln (Exports to WLD)	D1			0.002	0.878	0.062	0.002	0.058	0.004	0.061	0.002	-0.024	0.204	-0.019	0.204	0.018	0.792
Ln (Exports to WLD)	LD			-0.018	0.114	0.007	0.708	0.000	0.983	0.008	0.691	-0.018	0.199	-0.019	0.199	-0.024	0.631
Ln (Exports to WLD)	L2D			-0.003	0.765	-0.031	0.085	-0.024	0.229	-0.022	0.267	-0.030	0.036	-0.029	0.036	-0.040	0.427
Ln(Import from WLD)	D1					-0.008	0.545	-0.003	0.825	0.003	0.791	0.043	0.130	0.048	0.130	-0.012	0.462
Ln(Import from WLD)	LD					-0.018	0.108	-0.015	0.228	-0.012	0.295	-0.013	0.712	-0.011	0.712	0.014	0.368
Ln(Import from WLD)	L2D					-0.022	0.071	-0.019	0.128	-0.019	0.125	0.012	0.460	0.017	0.460	0.029	0.084
Ln (GDP)								0.072	0.408	0.086	0.317						
Ln(RBER)										0.008	0.036			0.006	0.123		
Ln(Wages)*Ln(Import from WLD)	D1															-0.012	0.462
Ln(Wages)*Ln(Import from WLD)	LD															0.014	0.368
Ln(Wages)*Ln(Import from WLD)	L2D															0.029	0.084
Ln(Wages)*Ln(Exports to WLD)	D1															-0.012	0.558
Ln(Wages)*Ln(Exports to WLD)	LD															0.003	0.818
Ln(Wages)*Ln(Exports to WLD)	L2D															0.003	0.849
Year Dummy		NO		NO		NO		NO		NO		YES		YES		YES	
Sargan Test (Pr>Chi^2)		0.010		0.016		0.027		0.025		0.031		0.226		0.192		0.635	
AC Order 1 (Pr>z)		0.000		0.000		0.002		0.002		0.004		0.003		0.005		0.001	
AC Order 2 (Pr>z)		0.834		0.959		0.361		0.522		0.301		0.699		0.488		0.415	

Sources: ECLAC-PADI (2003) ; UN COMTRADE (2004)

Table 17: Effects of trade with the PRC on manufacturing employment

Dependent Variable: Ln (Employment$_t$) - Log (Employment$_{t-1}$)

		Equation																	
		1		2		3		4		5		6		7		8		9	
		Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Constant		-0.039	0.000	-0.042	0.000	-0.038	0.000	-0.036	0.000	-0.035	0.001	0.610	-0.029	-1.047	0.038	-1.050	0.034	-0.008	0.887
Ln(Employment)	LD	0.001	0.995	-0.041	0.723	-0.006	0.958	-0.020	0.870	-0.039	0.766	-0.054	0.733	-0.192	0.209	-0.177	0.237	-0.030	0.846
Ln(Employment)	L2D	0.006	0.950	0.065	0.540	0.079	0.451	0.086	0.422	0.124	0.270	0.133	0.271	0.093	0.417	0.136	0.245	0.207	0.103
Ln(Wages)	D1	0.047	0.332	0.056	0.314	0.013	0.845	0.038	0.631	-0.006	0.941	0.079	0.509	-0.062	0.501	-0.091	0.326	0.059	0.612
Ln(Wages)	LD	-0.146	0.002	-0.064	0.168	-0.043	0.343	-0.039	0.424	-0.084	0.137	-0.028	0.736	-0.130	0.036	-0.144	0.019	-0.067	0.425
Ln(Wages)	L2D	0.010	0.716	0.073	0.017	0.044	0.160	0.042	0.185	0.003	0.938	-0.021	0.585	-0.006	0.866	-0.015	0.696	-0.033	0.392
Ln(Production)	D1	0.268	0.000	0.260	0.000	0.233	0.000	0.237	0.000	0.246	0.000	0.166	0.002	0.247	0.000	0.248	0.000	0.183	0.001
Ln(Production)	LD	0.136	0.000	0.113	0.006	0.126	0.004	0.132	0.004	0.112	0.023	0.147	0.014	0.125	0.013	0.130	0.009	0.139	0.017
Ln(Production)	L2D	0.001	0.965	-0.022	0.434	0.005	0.861	0.008	0.800	0.008	0.804	-0.137	0.018	0.018	0.594	0.015	0.646	-0.134	0.018
Ln(Export to USA)	D1			-0.001	0.914	-0.001	0.875	-0.001	0.861	-0.003	0.650	0.003	0.616	0.000	0.972	0.000	0.991	0.004	0.588
Ln(Export to USA)	LD			-0.006	0.375	-0.005	0.479	-0.005	0.425	-0.007	0.316	-0.001	0.865	-0.005	0.515	-0.003	0.711	0.000	0.968
Ln(Export to USA)	L2D			0.005	0.359	0.003	0.624	0.001	0.788	0.002	0.691	-0.001	0.928	0.001	0.801	0.004	0.507	0.000	0.937
Ln(Export to Brazil)	D1			-0.009	0.242	-0.007	0.314	-0.005	0.531	-0.004	0.654	0.006	0.599	0.005	0.604	0.006	0.583	0.006	0.633
Ln(Export to Brazil)	LD			-0.010	0.096	-0.010	0.121	-0.010	0.124	-0.016	0.060	-0.014	0.145	-0.014	0.098	-0.012	0.141	-0.013	0.165
Ln(Export to Brazil)	L2D			0.014	0.021	0.013	0.035	0.016	0.058	0.017	0.074	0.007	0.469	0.014	0.161	0.013	0.170	0.006	0.519
Ln(Export to China)	D1			0.003	0.328	0.005	0.168	0.004	0.211	0.005	0.161	0.006	0.138	0.005	0.181	0.005	0.177	0.005	0.210
Ln(Export to China)	LD			0.000	0.957	-0.001	0.817	-0.001	0.683	-0.001	0.860	-0.004	0.314	0.000	0.967	-0.001	0.835	-0.005	0.207
Ln(Export to China)	L2D			0.001	0.839	0.000	0.898	0.000	0.956	0.000	0.980	-0.003	0.357	-0.001	0.829	-0.001	0.708	-0.004	0.291
Ln(Import from USA)	D1					0.023	0.071	0.024	0.061	0.020	0.140	-0.001	0.934	0.021	0.130	0.020	0.139	0.002	0.906
Ln(Import from USA)	LD					-0.021	0.070	-0.020	0.180	-0.009	0.602	-0.002	0.891	-0.005	0.755	-0.003	0.867	0.001	0.963
Ln(Import from USA)	L2D					-0.009	0.411	-0.007	0.610	-0.010	0.525	0.008	0.655	0.001	0.966	0.001	0.941	0.011	0.547
Ln(Import from Brazil)	D1							-0.010	0.455	-0.008	0.548	-0.028	0.093	-0.019	0.206	-0.012	0.422	-0.018	0.304
Ln(Import from Brazil)	LD							-0.004	0.715	0.001	0.905	-0.007	0.624	-0.006	0.655	-0.002	0.875	-0.002	0.908
Ln(Import from Brazil)	L2D							-0.003	0.730	-0.002	0.889	0.008	0.510	0.002	0.871	0.003	0.785	0.012	0.312
Ln(Import from China)	D1									0.011	0.149	-0.001	0.903	0.012	0.135	0.011	0.149	-0.001	0.951
Ln(Import from China)	LD									0.005	0.652	0.004	0.722	0.006	0.601	0.003	0.812	0.000	0.979
Ln(Import from China)	L2D									-0.014	0.076	-0.017	0.067	-0.011	0.179	-0.014	0.089	-0.020	0.031
Ln(GDP)														0.206	0.045	0.207	0.040		
Ln(RBER)																0.006	0.173	0.008	0.122
Year Dummy		NO		NO		NO		NO		NO		YES		NO		NO		YES	
Sargan Test (Pr>Chi^2)		0.010		0.066		0.175		0.159		0.374		0.622		0.535		0.477		0.572	
AC Order 1 (Pr>z)		0.000		0.001		0.001		0.001		0.001		0.002		0.008		0.006		0.002	
AC Order 2 (Pr>z)		0.834		0.231		0.401		0.380		0.250		0.916		0.298		0.235		0.528	

Sources: Own calculations based on PADI (2003) and UN COMTRADE (2004)