IDPM - UA discussion paper

Poverty Effects from Trade Liberalisation in Argentina*

Ariel A. Barraud and Germán Calfat

2005 - 4

UNIVERSITY OF ANTWERP

INSTITUTE OF DEVELOPMENT POLICY AND MANAGEMENT

Comments on this Discussion Paper are invited.
Please contact the authors at <german.calfat@ua.ac.be>

Instituut voor Ontwikkelingsbeleid en -Beheer
Institute of Development Policy and Management
Institut de Politique et de Gestion du Développement
Instituto de Política y Gestión del Desarrollo

Venusstraat 35, B-2000 Antwerpen
België - Belgium - Belgique - Bélgica

Tel: +32 (0)3 220 49 98
Fax: +32 (0)3 220 44 81
e-mail: dev@ua.ac.be

http://www.ua.ac.be/dev

Poverty Effects from Trade Liberalisation in Argentina*

Ariel A. Barraud[1] and Germán Calfat[2]

* The authors are grateful to Lode Berlage, Alberto Diáz Cafferata, Marcelo Olarreaga and Geoffrey Reed, for very useful comments and discussions on previous versions of this paper. The usual disclaimer applies.

Institute of Development Policy and Management
University of Antwerp

March 2005

[1] Ariel A. Barraud is a PhD. student at the University of Antwerp in the field of International Trade and Development.

[2] Germán Calfat is a lecturer at the Institute of Development Policy and Management. He works in Trade theory, policy and modelling. He has an interest on the evaluation of preferential agreements, especially those involving Latin American economies.

Abstract

This paper aims at analyzing the linkages between international trade openness and poverty in Argentina. Under a specific-factors setting, a two-step procedure is presented. In the first stage the change in prices of goods and factors in both tradable and non-tradable sectors, after a trade liberalisation episode, is considered. In a second step, these variations are applied to assess the changes in poverty and households' welfare. A micro-simulation approach, using households' survey data, is applied in this last stage. The results of the research are important since they provide an assessment of the impact trade policies have on poverty.

Résumé

L'article ci-dessous vise à analyser les liens entre la libéralisation du commerce international et la pauvreté en Argentine. Selon un modèle à facteurs spécifiques, une procédure en deux étapes est présentée. Dans une première phase, on étudie le changement de prix des biens et facteurs tant dans les secteurs de ce qui est échangeable et de ce qui ne l'est pas, après une période de libéralisation du commerce. Dans une deuxième phase, ces variations sont appliquées pour évaluer les changements du point de vue de la pauvreté et du bien-être des ménages. Une approche par micro-simulation, utilisant les données de l'enquête auprès des ménages, est appliquée dans cette dernière phase. Les résultats de la recherche sont importants puisqu'ils permettent d'évaluer l'impact qu'une politique commerciale peut avoir sur la pauvreté.

1. Introduction

The ongoing globalization process drives a large part of countries' policy choices, with diverse effects on individuals and households. It is well known that any economic policy measure generally results in sectors which are benefited and sectors that result harmed from the measure. It is important, thus, to identify winners and losers as a result of trade policy reform. Moreover, if the affected individuals belong mainly to a segment of the population that lives below a given socioeconomic standard, the results will have direct implications on a country's development process. Trade policy affects the poor -as well as the non-poor- through changes in prices, but also through their effects on the labour market[1]. The aim of this paper is to establish to what extent trade policies -one of the most salient aspects of globalization- affect poor households in Argentina.

[1] McCulloch et al (2001) present a much broader set of effects of trade policy on poverty, including effects on government revenue and expenditure, risk and vulnerability of the poor and economic growth.

The remainder of this paper is structured as follows: section 2 surveys the existing literature on the subject under analysis. A brief characterization of the Argentinean economic situation is presented in section 3. Section 4 presents the methodology and the concepts that will be used. The results are in section 5. The paper concludes in section 6 with a discussion of its findings and limitations.

2. Background

During the last decade there have been several attempts to measure the effects of both trade and trade policy on poverty. Some of them conclude that trade is beneficial to the poor since it brings about economic growth without modifying income distribution. Others investigate the change that trade policy causes on the income and the consumption pattern of the poor. Among them, one can find aggregate studies as well as country case studies.

The existing cross-country studies refer mainly to different trade liberalisation experiences of developing countries during the last decades. The regression analysis of Dollar and Kraay (2001) shows a strong correlation between changes in trade and changes in growth. Moreover, as there is no clear evidence of correlation between changes in trade and changes in various measures of inequality -as the Gini coefficient or the Lorenz curve-, the authors conclude that greater openness results in poverty reduction. The debate on liberalisation and growth is still an unsettled issue due to the lack of adequate measures to quantify trade policy stances.

Despite evidences in favour of trade openness as a factor leading to poverty reduction, trade reform is opposed by some policy makers and by part of the citizenry, both in developed and developing countries. At the very centre of the disagreement is a time dimension in the relation between economic growth and trade policy. While, on the one hand, economic growth is a long-term consequence of trade openness -provided that there is a positive relation among the two-, on the other hand trade policy has adjustment costs in the short- and medium-term ought to its redistributive nature.

The impact of trade policy on the poor is channelled mainly through variations in relative prices of their consumption bundle and through changes in their sources of income. The study of the possible effects of policy measures on poverty can be conducted, therefore, in two steps: first, there is a need to determine the changes in prices brought about by a trade reform, to establish, in a second stage, the impact on households' welfare through the addition of the consumption and income effects.

The methodologies used in the recent literature to assess the effects of trade on poverty in specific countries vary from general equilibrium models to partial equilibrium models, or micro simulations based on either of them.

The use of general equilibrium models is extended in the literature on trade related matters. The broad economic effects of trade policy make these models suitable for the analysis of the effects of such reforms on the wide economy, when there is availability of data, resources and time, of which it makes intensive use. Bautista and Thomas (1997), Harrison et al (2003) and Löfgren (1999) are some among a growing number of authors that make use of this tool. Their evidence, however, is that only small effects are obtained from these models.

Various partial equilibrium models were constructed to address the issue of trade liberalisation in a given sector of the economy, and its impact on the poor. The partial equilibrium studies of Case (2000); Minot and Goletti (2000); and Nicita et al (2001) found pro poor effects of trade reforms. In contrast, empirical evidence on negative impacts on the poor was observed in Ravallion and Walle (1991).

A new line of studies tries to incorporate information at the household level within the models. As micro data are taken into account, these models are more reliable in capturing the individual heterogeneity which is partly responsible for the puzzling results previously found. Cogneau and Robilliard (2000), Ianchovichina et al (2001) and Cockburn (2002) incorporate household surveys data into CGE models. Actual household data is used in a partial equilibrium setting in Minot and Goletti (2000).

The Argentinean case is studied in Porto (2003a,b) using a mixture of the previous approaches. Our paper is in line with these studies, and tries to incorporate extensions to the application of their methodology.

3. Some recent stylized facts in Argentina

After an economic performance characterised by stagnation and instability, external debt crisis, deficit in public finances and high inflation in the 80's; the 90's were marked by a significant opening of the Argentinean economy that was aimed to solve part of these problems. Like many other Latin American countries, Argentina undertook a process of economic liberalisation, at the heart of which were the adoption of a currency board and the implementation of market-oriented policies, such as an extensive privatisation programme, deregulation of the economy and financial and trade liberalisation. This plan brought inflation under control, starting a period of price stability and of economic growth. Gradually, the currency board led to an overvalued currency. The country switched to a floating exchange regime after a significant devaluation in February 2002.

Even though rates of growth during the 90's were considerably high, unemployment rates rose sharply. Due mainly to the low cost of capital and the increase in imports, the production of goods and services became more capital-intensive and the structural change in the economy was based on a very low job creation rate. Poverty rates also increased in this period, and reached values never registered before in the Argentinean economic history.

Tables 1 and 2 summarize the evolution of selected indicators during the last decade, highlighting some characteristics and the economic situation of the poor households in Argentina. The poverty indicators follow the official definition of the National Bureau of Statistics and Census (INDEC), which defines a basic food basket, constructed considering the food consumption patterns of a reference household group between the 2nd and 4th income deciles in the 1985-86 Survey of Income and Expenditure for the *Buenos Aires Region* (GBA). The value of the basic food basket that would allow a representative adult male of age 30-59 with moderate activity to consume a daily energy intake of 2,700 calories is called an *adult equivalent indigent line*, and the individuals or households whose income is below this amount are defined as extremely poor or *indigents*. Observation of non-food consumption among households in the same income group gives the Engel coefficient (defined as the expenditure on food as a percentage of total expenditure) to estimate an *adult equivalent poverty line* in order to estimate poverty in the country (INDEC, 2003).

The percentage of extreme poor (indigent) and poor households has continually risen in Argentina during the last decade, and a major increase is observed after 2002. This pronounced increase is the result of both, the limited response of household income to devaluation effects, and the increase in prices with its corresponding upward movement in the poverty line. Even when the activity rate among poor individuals is lower than among non-poor, there is still a considerable part of the poor population that obtains their income in the labour market. Notice also that the unemployment rate is dispro-

portionately higher among the poor as compared with the rest of the society. The lack of unemployment insurance as a safety net results generally in unemployed population with no monetary income at all.

It is noticeable that in 2003 there was a worsening in the headcount ratio of poor while unemployment indicators showed signs of recovery, which indicates, as explained before, a disparity in the evolution of prices and wages.

The employment distribution of sectors by economic activity can add an extra dimension to the analysis of the relationship between poverty and policy changes. We selected eight private sectors, four of them tradables - *food and beverages, clothing, house equipment and maintenance, and other traded goods*- and four non-tradables -*housing* (including construction activities), *transport and communication, leisure* (including commerce) and *health and education*-.

The reason of the choice of these particular tradable and non-tradable sectors is twofold; on the one hand it includes goods and services that account for a large part of the poor household's budget, and, on the other hand, the products included in the traded goods category are importable and they will be directly affected by trade liberalisation[2]. Also, as shown in Table 2, these sectors account for a large percentage of the population that obtains their income in the private sector.

[2] This classification of goods is adopted in Argentina both by the Expenditure Surveys and by the price indices periodically published by INDEC.

There is an increase in non-traded sectors as the main source of income for the households over the period considered, and the most significant difference among poor and non-poor households is in the housing sector. The types of labour included in housing, such as construction activities, were traditionally carried out by the poor segment of the population in Argentina.

It is important, given the magnitude of the non-tradable sector, to consider the effects a trade policy may have on it in addition to the evaluation of changes in the tradable sector itself.

4. Methodology

In line with the methodology proposed in the recent literature on the effects of trade policy on poverty, a two-stage procedure will be followed.

Following a first-order approximation approach, the changes in goods and factors prices are obtained first. In the second step the impact of these changes on the income and expenditure of each household in the sample are simulated in order to estimate the impact of the policy on different types of households in terms of income and poverty.

4.1. Product prices

Following a trade shock, the domestic price of goods is most likely to be changed, and these changes will be different according to the goods involved.

4.1.1. Traded Goods

The equation of traded goods prices relies on a model of export pricing. A foreign export firm maximize prices (p) taking their input costs, exchange rate and tariffs as given. Costs are homogeneous of degree one in the price of factors (w), thus $C=wc(x)$ where x is output and $c(x)$ are unit costs.

The demand for his product in Argentina is given by $q(p,y)$, a function of the price, and real national income y.

The firm's objective function and first order condition may thus be written:

(1) $$Max_p \left[\frac{e}{\tau} pq(p,y) - wc(x) \right]$$

with FOC

(2) $$p\left[1+\frac{1}{\xi}\right] - \frac{w\tau}{e} c(q(p,y)) = 0$$

where $\tau = (1+t)$ is the ad-valorem tariff charged by Argentina, e is the exchange rate in Argentina, and y stands for real income. The price elasticity ξ is affected by the same variables as demand.

Thus, the domestic price of a traded good (or group of goods) i, is determined by

(3) $$p_i = p_i(\tau_i, w_i, e, y)$$

Under perfect competition and no additional trade barriers, one can assume that the change in domestic prices is equal to the change in tariffs. Otherwise, changes in trade tariffs are not fully passed onto domestic prices.

The diversity of goods is taken into account since some key products (from the point of view of production and consumption) are considered. In this paper we consider the four groups of traded products already defined: *food and beverages, clothing, house equipment and maintenance,* and *other goods*.

Argentina is assumed to be a small open economy that takes the price for each of the four groups of goods as an exogenous parameter.

4.1.2. Non-traded Goods

Even when trade policy affects directly the prices of tradable goods, it is also important to asses the transmission of the policy to the prices of non-tradable goods as well. This is so because a large percentage of the population obtain their income from the non-tradable sector and these goods represent a considerable share of total household consumption.

To obtain the equation for non-traded good prices, a demand-supply equality in domestic markets is useful, in the form:

(4) $$\sum_h \frac{\partial}{\partial p_j} e^h\left(\mathbf{p}_i, \mathbf{p}_j, u^h\right) = \frac{\partial}{\partial p_j} r\left(\mathbf{p}_i, \mathbf{p}_j, \mathbf{L}\right)$$

where the sub index i indicates traded goods and the sub index j non-traded goods, e^h is the expenditure function of household h, which depends on prices and a required utility u^h, whereas on the right hand side of the equation r stands for the GDP function of the economy and $\mathbf{L}$ is a vector of factor endowments. By application of Shepard's Lemma the derivative of the expenditure function with respect to the price of non-traded good j gives us the demand for this good, and its supply is given by the own-price derivative of the GDP function, according to Hotelling's Lemma. If the factor endowments and prices of traded goods are given, the equilibrium prices of non-traded goods are endogenously determined by

(5) $$p_j = p_j\left(\mathbf{p}_i, \mathbf{L}, \upsilon\right)$$

where υ are income distribution, preference shifters or other variables. Given this formulation, trade policy will affect non-traded goods prices indirectly through changes in traded goods prices. The four non-traded goods considered are *housing, transport and communication, leisure, and health and education.*

4.2. Household income

In order to assess the impact of economic reforms on households it is essential to measure the change in their income after a trade policy measure is adopted.

Let the income of each household *h* be

(6) $$Y_h = \sum_f w_f(p_f) \cdot L_f + \sum_m \sum_k Z_{mk}$$

Where w_f is the wage rate for labour in sector *f*, L_f is the labour sale to sector *f*, and Z_{mk} is other income received by each household member *m* from source *k* -all other sources different from labour income-.

In what follows we will focus exclusively on the effects of changes in the trade policy variable τ_i on labour income. The validity of this simplification is granted in the Argentinean case, since most of the people obtain their income from labouring either in the formal or informal market[3] . We will also follow a first-order approximation approach to assess the effects of trade policy, according to which the only prices that change are the prices of the goods under consideration. A further simplification assumes that the amount of labour L_f is not affected by the policy. Thus,

[3] This is true for the urban poor. The rural population, which represents only 13 per cent of total population was not considered given the lack of data availability.

(7) $$dY_h = \sum_i \sum_f \frac{\partial w_f}{\partial p_f} \frac{\partial p_f}{\partial \tau_i} d\tau_i \cdot L_f$$

(7) can also be written proportionally as

(8) $$\frac{dY_h}{Y_h} = \sum_i \sum_f \alpha_f^h \varepsilon_f^h \frac{\partial \ln p_f}{\partial \tau_i} d\tau_i$$

where α_f^h is the share of the labour income derived from sector *f*, and ε_f^h is the elasticity of the labour income in sector *f* with respect to the price in this sector p_f.

The consumption of the household can be written as

(9) $$C_h = \sum_f p_f \, q_f^h$$

where q_f^h is the quantity consumed of good *f*.

Under the current first-order analysis, quantities consumed are assumed to remain fixed, thus the change in consumption is equal to

(10) $$dC_h = \sum_i \sum_f q_f^h \frac{\partial p_f}{\partial \tau_i} d\tau_i$$

And expressed relative to income

(11) $$\frac{dC_h}{Y_h} = \sum_i \sum_f \omega_f^h \frac{\partial p_f}{\partial \tau_i} d\tau_i$$

where ω_f^h is the value of consumption of good *f* as a proportion of income (or total expenditure).

Notice that when *f* is a traded sector (sub index *i*), the effect of trade policy on the price is simply

$$dp_i = \frac{\partial p_i}{\partial \tau_i} d\tau_i \tag{12}$$

whereas for non-traded goods (sub index *j*) the effect is given by

$$dp_j = \frac{\partial p_j}{\partial p_i} \frac{\partial p_i}{\partial \tau_i} d\tau_i \tag{13}$$

4.3. Poverty and welfare measures

4.3.1. Poverty measures and poverty lines

Several measures of poverty and poverty lines are used in the literature on trade and poverty, and the results obtained are sensitive to the measure chosen. The poverty line will be defined in this study following INDEC (2003), since this makes the results comparable with existing studies and official data.

The measures of poverty most widely used are those based on monetary measures of income and consumption. *Headcount Poverty Indices* (HC) are the most popular, easiest to understand and simplest to compute indicators. They measure the percentage of the population falling below a given poverty line *v*.

$$HC = N^{-1} \sum_n^N 1;(Y_n \leq v) \tag{14}$$

where *N* is the total number of individuals, and Y_n is individual income.

This index only captures how many people are poor in a region or country. A further dimension that should be taken into account is the depth of poverty, which, like the *Poverty Gap Index* (GI) in equation (15), measures the average level of consumption or income of the poor with respect to the poverty line.

$$GI = N^{-1} \sum_n^N \left(\frac{v - Y_n}{v} \right) \cdot 1;(Y_n \leq v) \tag{15}$$

The Foster-Greer-Thorbecke (1984) family of indices (*FGT*) provide a more complete picture of poverty. They simultaneously consider the percentage of the poor, their average income or consumption and the distribution of the income or consumption among them. *FGT* indicators

measure poverty as a normalized weighted sum of the income shortfalls of the poor. In their approach, deprivation depends on the distance between a poor household's actual income and the poverty line. Accordingly, poverty is measured as:

$$FGT = N^{-1}\sum_{n}^{N}\left(\frac{v - Y_n}{v}\right)^{\alpha} \cdot 1\,;(Y_n \le v) \tag{16}$$

The parameter α can take diverse values, yielding different *FGT* indices. When α is equal to zero we obtain *HC*, whereas *GI* is obtained when α equals one. By setting α equal to a larger value (usually two) we measure the severity of poverty, whereby a greater weight is put on the households with income farther below the poverty line.

4.3.2. Welfare indicators

Even when poverty measures can be regarded as welfare functions (Deaton, 1997), we can derive a more acceptable welfare indicator to asses the effects of trade policy.

Let each individual maximize the general preference function

$$U_n = U\left(q_1^n, \cdots, q_F^n\right) \tag{17}$$

where q_f^n are the quantities consumed of each of the *f* goods, and *U* have the usual properties that allows to solve the maximization problem subject to a budget constraint represented by

$$Y_n = \sum_{f}^{F} p_f q_f^n \tag{18}$$

The solution of this problem yields

$$dU_n = \sum_{f}^{F}\frac{\partial U}{\partial q_f^n}dq_f^n = \lambda\sum_{f}^{F} p_f dq_f^n \tag{19}$$

where the Lagrange multiplier λ -the marginal utility of money expenditure- is positive.

For relatively small changes we can use the welfare indicator:

$$dW_n = \sum_{f}^{F} p_f dq_f^n \tag{20}$$

since it has the same sign as dU_n (McKenzie, 1983). Also, from the budget constraint

$$dW_n = dY_n - \sum_{f}^{F} q_f^n dp_f \tag{21}$$

And expressed as a proportion of income

(22) $$\frac{dW_n}{Y_n} = \frac{dY_n}{Y_n} - \sum_{f}^{F} w_f^n dp_f$$

Notice that the terms in the right hand side of (22) are equivalent to (8) and (11) respectively[4].

The first-order percentage change in welfare in equation (22) can be calculated from information on the percentage changes in prices, income shares, and budget shares of different expenditure items.

[4] See Minot and Goletti (2002) Appendix 2 for a derivation of a second-order approximation of net welfare effects. Their first-order approximation is conceptually identical to the one described here.

5. Results

In this section we present the results of the trade policy exercise. A full unilateral trade liberalisation scenario is assumed[5]. The elimination of all the tariffs faced by the four categories of products might not represent a realistic policy choice. Nevertheless, as Ianchovichina et al. (2001) note, such an exercise is considered a good testing point of the model. It is also important to emphasize at this point the partial equilibrium nature of the exercise. The results that are presented in this section are the simulated consequences on poverty of the elimination of trade tariffs, making abstraction of the rest of domestic or foreign policies that could affect also these variables.

[5] This exercise could also be extended to evaluate the effects of signing a free trade area agreement with the major trading partners of Argentina outside MERCOSUR, such as a FTAA or an EU-MERCOSUR scenarios.

We proceed first to quantify the changes in prices and household income, and then to incorporate them to the households in the survey so as to calculate the changes in the different measures of poverty.

5.1. Changes in tradable prices

The main trade policy barriers in Argentina are tariffs. Table 3a shows the current trade tariffs for each one of the four traded goods considered. Argentina charges zero tariff to the imports coming from MERCOSUR partners, and a common external tariff to imports extra zone.

The *assumption* of price changes "is particularly valuable where the price changes likely to result from the implementation of a reform are not known with any degree of accuracy" (McCulloch, 2003). However, the estimation of pass through from trade policy to prices is a much more correct procedure. For estimation purposes we log-linearise (3) and estimate

$$\ln p_i = q + b \ln \frac{w\tau}{e} + \delta y + \mu_i \qquad (23)$$

In (23) we regressed unit values of imports for each tradable good coming from non-MERCOSUR partners on tariffs and real GDP with yearly data for the period 1995-2001 (tariffs on imports coming from MERCOSUR members were zero in this period). The cost of factors w and the exchange rate e were kept constant in the estimation, while μ_i is an error term. The unit values and the regional shares of imports are computed from data on Argentinean imports at the ISIC two digit level obtained from INTAL, since this classification is the closest to the one used by INDEC. Annual real GDP is computed from INDEC. The estimates are in Table 3a.

The results reflect that only part of tariff reduction will be passed through onto consumer prices, which could indicate the relative degrees of competition in the different sectors, with *food and beverages* as the most competitive sector in one extreme and the *other traded goods* reflecting a more imperfectly competitive structure.

The domestic price indices for the tradable products are considered to be a weighted average of the price of imports, with the weights equal to the share of the imports coming from each group of partners (MERCOSUR or rest of the world partners). The changes in tradable prices induced by the elimination of the trade barriers are shown in the last column of Table 3a.

5.2. Changes in non-tradable prices

The price of non-tradable goods and services is indirectly affected by trade policy through changes in the prices of traded goods, as stated in equation (2). To estimate these changes, we first need to estimate this equation. For each non-tradable, we estimate a dynamic equation of the form

$$\ln p_{jt} = \alpha + \sum_{i} \ln p_{it}\beta_{0i} + \sum_{i} \ln p_{it-1}\beta_{1i} + \mathbf{c}_t'\gamma + u_t \tag{24}$$

where lnp_{jt} are the values of a monthly index of prices of non-traded goods (in natural logarithm), lnp_{it} are the values of a monthly index prices of traded goods (in natural logarithm), $\mathbf{c}_t$ is a vector of controls that includes time trends and year dummies and u_t is an error term. To avoid the problem of spurious regression we estimated the model in first-differences. The variance of the coefficients was consistently estimated with the Newey-West correction for autocorrelation in the residuals using a lag of twelve months. The data on prices is published by INDEC.

The resulting sensibility of the prices of non-traded goods to the prices of traded goods ($\beta_{0i} + \beta_{1i}$), as well as the change in non-traded prices due to the policy adopted, are shown in Table 3b. The relationship among prices is complex, and the elasticities are not assumed to take any particular value *a priori*. The effect of the liberalisation on the prices of non-traded goods is not as straightforward as in the case of tradable goods. The response in prices will depend on the extent to which the increase in aggregate demand is offset by a switch in demand towards non-tradables as their relative price declines. Moreover, as pointed out in Porto (2003b) the interpretation of the results may rely on the different skill intensity of the sectors involved in the analysis. For example, the negative relation between the prices of *food and beverages* and *clothing* -both relatively intensive in unskilled labour- with *health and education* -relatively intensive in skilled labour- implies that an increase in the price of *food and beverages* and *clothing* would lead to an increase in the relative wage of unskilled workers and consequently to a decrease in the price of *health and education*.

As a result of the liberalisation the price of *leisure* goods and services increased, the price of *health and education* is considerably reduced, whereas the reduction in prices in the rest of the sectors are much more modest.

The changes in prices of traded and non-traded goods will be useful to evaluate the changes in income of the households and in the updating of the poverty line.

5.3. Changes in income

To asses the changes in income after the trade measure is adopted, some structure has to be set to relate labour income and prices. We adopt a specific-factors approach, in the sense that the wages that equilibrate the labour market are assumed to be defined sectorally by

$$w_f = w_f\left(p_f, \psi\right) \tag{25}$$

where ψ are other exogenous determinants such as individual characteristics.

Product price increases (decreases) in one sector will trigger an increase (decrease) in the production of this sector. Once the specific factor (labour in this case) demand changes, wage will vary in this sector.

To estimate (25) we follow the econometric method developed in Porto (2003a,b), which exploits the time variability in prices and household surveys. It is assumed that labour income in each sector is a function only of the price of the goods and services of the same sector. This allows us to consider the heterogeneity among the different industries.

The equation that captures the diverse wage responses to changes in prices is

$$\ln w_f = \ln p_f \beta + \psi_f' \gamma + \varepsilon_f \tag{26}$$

Where β is the labour income elasticity with respect to the price in sector *f*, ψ_f is the vector of exogenous controls: gender, experience, skill level, household status, and a time trend. ε_f is the disturbance error.

Data on labour income is obtained from the Permanent Household Survey (EPH) which is the main source of individual and household data in Argentina. The EPH is a national and inter-census program undertaken by INDEC from 1972 onwards. This survey reveals socioeconomic information over 28 metropolitan areas of the country. It includes data about the living conditions and demographic characteristics of the households (family questionnaire) and trough its individual questionnaire, it provides personal data about income, education, labour and migration.

For the estimation of (26), the surveys from May 1992 to October 2000 were considered. The price indices for each one of the eight groups of goods

over the 18 survey periods were obtained from INDEC, which publishes them monthly.

The model was estimated with the OLS technique, using the Huber-White estimator of variance to assure robustness, and also taking into account that since in each period all households face the same prices, the observations can be independent across surveys but not necessarily independent within them.

Table 4 lists the results. A discrimination is made among the Buenos Aires region (GBA) and the rest of the country, since it is plausible that the labour market behaves differently in both regions. Wages in all sectors demonstrated to be fairly sensitive to changes in the sectoral prices, with the GBA region showing higher elasticities. This can be explained from the fact that it is in this region where large part of the country economic activity takes place, and consequently the labour market is larger and more responsive to market signals.

Table 5 contains the changes in income for workers in each sector, which result from the product of the percentage variation in prices and the corresponding income elasticity. After the trade liberalisation exercise, reductions in income are the common result except for the case of *leisure* goods, and the magnitudes are somewhat higher in the GBA region as expected according to the elasticities observed.

In the next section, the simulated new levels of income are used to measure the effects of the trade liberalisation exercise on poverty.

5.4. Poverty and welfare effects

To assess the effects of the policy simulation on the poor households, this study uses a special survey conducted in November of 2002 in Argentina by the World Bank (2002)[6] . The survey is nationally representative and covered 2800 households in different regions, some of them belonging to small urbanisations (less than 2000 inhabitants). The survey was chosen not only because of being recently conducted, but also since it contains information on income and consumption for each household. This feature of the survey differentiates it from the existing household surveys. Data on household income and consumption are not gathered together in Argentina. The EPH, containing mainly information on income and labour variables, is conducted twice a year while the National Expenditure Survey (ENGH) is conducted separately and in broader time spans (a decade).

[6] The fact that at that time Argentina had already devaluated the peso may be somewhat disturbing since we are using coefficients estimated from data up to 2000. Notwithstanding, the results presented in this section still hold even using the 90's household surveys.

The values of the three poverty measures described in Section 4 that correspond to the survey period, are presented in the first three columns of Table 6. Data are presented countrywide, and also separately for GBA and an

aggregate of the rest of the regions, which is valid given the property of decomposability of the measures (Foster et al, 1984)[7]. These values were computed with the official value of poverty lines for the period (INDEC, 2003). When the World Bank's survey took place, the economic crisis that started in 1998 and that was exacerbated by the currency devaluation of the first month of 2002 was already slowly receding. However, the headcount ratio of 43.7% is still high for the Argentinean standards. In some impoverished regions of the country there was even a higher number of poor. Conversely, in GBA the headcount was lower than for the rest of the country.

[7] The values for individual regions are not presented, since they were not significantly different from each other. The simulations, however, were conducted using regional elasticities and poverty lines.

The poverty gap of almost 0.25 indicates that the total amount that the poor households are below the poverty line is equal to the number of total households multiplied by a quarter of the poverty line (Deaton, 1997). The differences between GBA and the rest of the regions is also noticeable with this indicator. The poverty severity measures follow the same pattern as the poverty gap.

The rest of the columns of Table 6 show the effect on the poverty measures of the elimination of tariffs, using the generated data computed as if they were data from a household survey carried out after trade liberalisation. The results are obtained at the household level, imposing the changes in income to the household's head, according to his or her sector or industry. In addition, the aggregate and regional poverty lines are updated taking into account the changes in prices from the previous analysis. Since this is a partial equilibrium study, the price of the rest of the goods, as well as the labour income in the rest of the industries, are assumed to remain unchanged. To adjust the poverty lines, we used the weights that correspond to each of the eight groups of products in the total expenditure, as reported in the National Expenditure Survey 1997.

Poverty as measured by any of the three considered measures declines in all regions. Therefore, it is clear that the reduction in labour incomes is outweighed by the reduction in prices comprised in the updating of the poverty lines. The changes reach values of more than 2 percentage points, which represent almost 200000 households or nearly 800000 individuals. There is evidence of a smaller relative reduction in poverty in GBA, where poverty indicators previous to the simulation were lower than those of the rest of the country. This is compatible with the reduction in the poverty gap and severity measures. The reduction in these measures indicates that there will be both less distance between the income of the poor and the new poverty lines, and a reduction in the gap among the poor themselves. Notice that the decline of the two measures at the aggregate level is largely due to their reduction in the regions other than GBA.

The sectoral identification of households leaving poverty can help us to understand the features of the model presented. These households obtain their income mostly from non-traded sectors, and mainly the households related to

the *housing* and *leisure* sectors are the ones leaving poverty after the reform, as shown in Table 7. Recall that *housing* is composed mainly from construction activities, and *leisure* is made of commerce, restaurants and tourism activities which attract mainly unskilled labour. We have shown that these sectors were relatively less affected by the policy. When this is combined with the change in the cost of the consumption basket, the result is that sectors less affected directly by trade policy end up more affected by such measure. Moreover, labour in construction, being more volatile than other industries, will result in more pronounced changes in poverty reduction, as a consequence of a positive shock induced by favourable changes in relative prices. This result is in line with the characterization of these sectors as the most vulnerable to changes in economic conditions[8].

[8] According to a Worl Bank study "…the variance of employment growth in construction is over four times higher than the average variance for overall employment" (World Bank, 2000, p. 23)

Since the use of official poverty lines might appear arbitrary to some extent, we turn next to an evaluation of the welfare changes after trade liberalisation as measured by equation (22). Changes in welfare as a percentage of the initial level of income are presented in Table 8. As with the previous tables, in addition to the country level results; GBA and the rest of the regions outcomes are differentiated. To capture some of the distributive effects of the simulation[9], households are divided into quintiles of family income, and the changes in welfare correspond to the average change in each quintile.

[9] Notice that we are only considering labour income. A more complete picture of the distributive effects would include changes in the returns to factors other than labour.

Changes in welfare are not large, as income and consumption changes tend to compensate each other and among households. It is noteworthy to observe that a positive change in welfare in all quintiles is obtained regardless of the region. All households were benefited in average from the elimination of tariffs. Along the lines of Dollar and Kraay (2002), no distributional effects arise from the simulated policy if we consider the personal distribution of income that is the distribution of income among individuals, families or households, regardless of what factors of production they own or to which sector they are linked. However, once we consider the functional distribution of income the results in table 9, show a different picture. We separated the households were the measure of welfare is reduced from the households were it is increased. Among the "losers" there is a disproportionate majority of households linked to the traded sectors, while the "winners" are to be found in the households whose main source of income comes from the non-traded sectors. Therefore, a further trade liberalisation in Argentina is not to trigger resistance from the poorest, traditionally employed in temporary jobs in domestic trade and commerce and in the highly variable construction activities, but rather face some discontent among the industrial, tradable sectors.

6. Conclusions

Using a simple model to examine the effects of changes in tariffs on households, we analyzed to what extent a complete liberalisation of trade will affect the degree of poverty in Argentina. The elimination of tariffs was related to the price levels of both tradable and non-tradable goods, and to income changes of workers in different economic sectors. The changes in prices were also included in the poverty thresholds that were used to obtain the poverty indicators after imposing the policy measure. The policy experiment was revealed to be poverty reducing. The results also hold when regional heterogeneities are considered, and show a relatively smaller effect in the Buenos Aires region as compared to the rest of the regions.

An indicator of household welfare change was also assessed, which showed a slight increase in welfare for the average household along the complete income distribution.

The overall impact of trade liberalisation on the poor under the settings of the model does not appear to be negligible. In addition, some interesting results emerge. Poverty falls and there is a reduction in inequality among the poor. Furthermore, the households that benefit from the reduction in poverty are those linked to the non-traded sectors as in the case of the construction activities.

In our model, the effects of a policy directed towards one sector -the traded goods sector- have repercussions in other sector -the non traded goods- through the indirect links among them and through the consumption effects generated by the policy measure itself.

There is a need to qualify the findings of the study due to modelling limitations. The aggregation of goods imposed as a result of data availability does not allow studying the impact of more specific trade policies on the poor. More importantly, the changes in income were simulated assuming no changes in employment, and the absence of intersectoral movements of labour. Given that one of the main causes of poverty in Argentina appears to be unemployment, a valuable extension of the model would be an adequate characterization of labour market structure and the inclusion of job creation and job destruction effects of trade liberalisation. These features will improve the analysis of the effects of such a policy[10].

[10] There is few research undertaken in this area, with the exception of Nicita and Razzaz (2003).

References

Atkinson, A B. 1987. *"On the Measurement of Poverty",* **Econometrica, Vol. 55** (4) pp. 749-64.

Bautista, R.M. and M. Thomas. 1997. *"Income effects of Alternative Trade Policy Adjustments on Philippine Rural Household: A General Equilibrium Analysis"*, **TMD Discussion Paper No 22,IFPRI**, Washington D.C., U.S.A.

Berg, Andrew and Anne Krueger. 2003. *"Trade, Growth, and Poverty: A Selective Survey"*. **IMF Working Papers** 03/30.

Bhagwati and T.N.Srinivasan. 2002. *"Trade and Poverty in the Poor Countries"*, **American Economic Review. 2002** 92 (2)180-183.

Bourguignon, F., Pereira da Silva L. and Stern, N. 2002. **"Evaluating the Poverty Impact of Economic Policies : Some Analytical Challenges"**, World Bank.

Case, Anne. 1998. **"Income Distribution and Expenditure Patterns in South Africa"**. Paper prepared for the Conference on Poverty and the International Economy, organised by World Bank and Swedish Parliamentary Commission on Global Development, Stockholm, October 20-21, 2000.

Chen, Derek, Alessandro Nicita and Marcelo Olarreaga. 2002. **"Trade, Aid and Poverty: the case of low income countries"**, mimeo, The World Bank, Washington DC.

Cockburn, J. 2002. **"Trade Liberalisation and Poverty in Nepal A Computable General Equilibrium Micro Simulation Analysis"**. The Centre for the Study of African Economies Working Paper Series. Working Paper 170.

Cogneau, Denis and Robilliard Anne-Sophie. 2000. **"Growth, Distribution and Poverty in Madagascar: Learning from a Microsimulation Model in a General Equilibrium Framework"**. IFPRI. TMD Discussion Paper No. 61.

Deaton, A. 1997. **"The Analysis of Household Surveys. A Microeconometric Approach to Development Policy"**, John Hopkins University Press for the World Bank.

Dollar, David and Kraay, Aart . 2002. **"Trade, Growth andPoverty"**, World Bank Policy Research Department Working Paper No. 2615. Washington.

Foster, James and Greer, Joel & Thorbecke, Erik. 1984. *"A Class of Decomposable Poverty Measures"*, **Econometrica, Vol. 52** (3) pp. 761-66.

Galiani, S. and P Sanguinetti. 2000. **"Wage inequality and trade liberalization: Evidence from Argentina"** . Universidad Torcuato Di Tella. Mimeo.

Gurgel, Angelo; Harrison, Glenn W.; Rutherford, Thomas F. and David G. Tarr. 2003. **"Regional, Multilateral, and Unilateral Trade Policies of MERCOSUR for Growth and Poverty Reduction in Brazil"**. World Bank, Working Paper 3051.

Harrison, G.W., T. F. Rutherford and D. G. Tarr. 2003. *"Trade Liberalization, Poverty and Efficient Equity"*. **Journal of development Economics 71**, June 2003, 97-128.

Hertel, Thomas, Maros Ivanic, Paul Preckel and John Cranfield. 2003. **"The Earnings Effects of Multilateral Trade Liberalization: Implications for Poverty in Developing Countries"**. GTAP Working Paper 1050.

Hoeckman, Bernard; Michalopoulos, Constantine; Schiff, Maurice and David Tarr. 2001. **"Trade Policy Reform and Poverty Alleviation"**. World Bank Working Paper No. 2733.

Ianchovichina, Elena, Nicita, Alessandro and Isidro Soloaga. 2001. **"Trade Reform and Household Welfare: The Case of Mexico"**. World Bank. Working Paper 2667.

Jones, Ronald W. and Jos'e Scheinkman. 1977. *"The Relevance of the Two-Sector ProductionModel in Trade Theory."* **Journal of Political Economy, 85**: 909-35.

INDEC. 2003. **"Incidencia de la Pobreza y de la Indigencia en los Aglomerados Urbanos."** Press release, Buenos Aires, Argentina.

Leamer, Edward E. 1995. **"The Heckscher-Ohlin Model in Theory and Practice"**. Princeton Studies in International Finance, No. 77.

Lofgren H. 1999. **"Trade Reform and the Poor in Morocco: a Rural-Urban General Equilibrium Analysis of Reduced Protection"**. TMD Discussion Paper No 38, IFPRI, Washington, D.C. U.S.A.

Matusz, S.J. and D. Tarr. 1999. **"Adjusting to Trade Policy Reform"**. World Bank - Country Economics Department Papers 2142.

McCulloch, N. 2003. **"The Impact of Structural Reforms on Poverty: a simple methodology with extensions"** World Bank Policy Research Working Paper 3124, August 2003.

McCulloch, Neil; Winters, L. Alan; and Cirera, Xavier. 2001. **"Trade Liberalization and Poverty: A Handbook",** London, Center for Economic Policy Research.

Minot, N., and F. Goletti. 2000. **"Rice Market Liberalization and Poverty in Vietnam"**, IFPRI Research Report No. 114.

Nicita, Alessandro and Razzaz, Susan. 2003. **"Who benefits and how much? How gender affects welfare impacts of a booming textile industry"** World Bank Policy Research Working Paper 3029, April 2003.

Porto, Guido. 2003a. **"Trade Reforms, Market Access and Poverty in Argentina"**. IV Reuni'on sobre Pobreza y Distribuci'on del Ingreso. La Plata, 26 y 27 de Junio de 2003.

Porto, Guido. 2003b. **"Using Survey Data to Assess the Distributional Effects of Trade Policy"**. World Bank Working Paper No. 3137.

Ravallion, M., and D. van de Walle. 1991. *"The Impact on Poverty of Food Pricing Reforms: A Welfare Analysis for Indonesia"*. J**ournal of Policy Modeling, 13**(2): 281-299.

Ravallion, Martin. 2003. **"The Debate on Globalization, Poverty and Inequality: Why Measurement Matters"**. World Bank Policy Research Working Paper 3038, April 2003.

Reimer, Jeffrey J. 2002. **"Estimating the Poverty Impacts of Trade Liberalization"**. Center for Global Trade Analysis, Department of Agricultural Economics, Purdue University. GTAP Working Paper 1163.

Winters, L Alan. 2000. **"Trade, Trade Policy and Poverty: What Are The Links?,"** CEPR Discussion Papers 2382, C.E.P.R. Discussion Papers.

World Bank. 2000. **"Argentina: poor people in a rich country, a poverty report for Argentina"**. Washington, D.C. March 23, 2000.

World Bank. 2002. **"Impacto Social de la Crisis en Argentina"** Washington, D.C. June, 2002. Available: http://www.bancomundial.org.ar/inf_esp.htm.

Tables

Table 1. Economic Indicators. Selected Years.

Year		1993	1998	2003
GDP annual growth rate (%)		6.3	3.9	8.8
Exchange rate (Arg$/USD)		1.0	1.0	3.0
Adult equivalent indigent line (Arg$)		60.89	68.28	106.55
Adult equivalent poverty line (Arg$)		137.01	159.77	232.28
Non-poor households (%)		86.6	79.8	63.5
Poor households (%)		13.4	20.2	36.5
Poor non-indigent households (%)		8.3	11.5	21.4
Indigent households (%)		5.2	8.6	15.1
Average Household Income (Monthly, Arg$)	Non-poor households	1,134	1,189	1,341
	Poor households	206	218	413
	Poor non-indigent households	311	348	515
	Indigent households	118	126	235
Average per capita Income (Monthly, Arg$)	Non-poor households	392	436	487
	Poor households	43	45	91
	Poor non-indigent households	65	73	121
	Indigent households	19	21	47
Activity rate (%)	Non-poor households	50.2	46.4	49.2
	Poor households	34.3	30.8	38.3
	Poor non-indigent households	35.7	32.9	40.0
	Indigent households	32.8	27.5	35.9
Unemployment rate (%)	Non-poor households	7.0	10.3	9.6
	Poor households	21.4	29.4	25.1
	Poor non-indigent households	20.6	26.7	19.9
	Indigent households	21.2	33.4	32.9

Source: GDP and exchange rate: INDEC
rest of variables: own calculations with data from EPH.
Unemployment rate corresponds to heads of households.

Table 2. Sector of Employment (Percentage of Head of the Household by their Primary Activity)

Sector	Year	1993	1998	2003
Food & Beverages	Non-Poor household	4.4	3.6	4.2
	Poor household	4.7	4.8	5.2
Clothing	Non-Poor household	4.9	3.1	2.9
	Poor household	5.6	3.7	3.1
House Equipment & maintenance	Non-Poor household	5.2	4.2	3.6
	Poor household	5.5	3.2	2.3
Other Traded Goods	Non-Poor household	6.4	5.5	3.9
	Poor household	7.4	4.6	3.7
TRADED	**Non-Poor household**	**20.9**	**16.5**	**14.6**
	Poor household	**23.2**	**16.3**	**14.2**
Housing	Non-Poor household	21.3	21.9	19.6
	Poor household	28.1	37.1	27.4
Transport & Communications	Non-Poor household	4.7	5.9	5.1
	Poor household	4.1	4.1	4.6
Leisure	Non-Poor household	20.8	19.0	18.5
	Poor household	18.6	17.4	18.2
Health and Education	Non-Poor household	12.1	13.5	17.0
	Poor household	8.5	5.7	11.0
NON-TRADED	**Non-Poor household**	**58.9**	**60.3**	**60.3**
	Poor household	**59.3**	**64.3**	**61.2**
Other (including public)	**Non-Poor household**	**20.2**	**23.2**	**25.1**
	Poor household	**17.5**	**19.4**	**24.6**

Source: own calculations with data from EPH waves May 1993, May 1998 and May 2003..

Table 3a. Tariffs and Price Changes Tradables

Sector	Tariff	Price Elasticity	Share imports non-MERCOSUR	Change in price
Food & Beverages	13.4	0.64 (2.83)	0.55	-4.79
Clothing	17.8	0.58 (3.75)	0.58	-6.02
House Equipment & maintenance	12.2	0.54 (1.83)	0.78	-5.21
Other Traded Goods	12.1	0.23 (2.18)	0.77	-2.12

Source: Tariffs from Galiani, S. and P Sanguinetti. (2000). Price Elasticity from estimates of equation (23) with t statistic in brackets. Share of imports: own calculation using data from DataIntal. Change in domestic prices according to equation (12).

Table 3b. Price Changes Non-Tradables

	Response with respect to tradables				
Sector	**Food & Beverages**	**Clothing**	**House Eq. & Maint.**	**Other Traded Goods**	**Change in price**
Housing	0.029	-0.012	0.082	0.283	-1.09
Transport & Com.	0.002	0.149	0.022	0.176	-1.40
Leisure	0.069	-0.878	0.413	0.713	1.29
Health and Education	-0.166	-0.019	0.830	0.296	-4.04

Price responses from estimates of equation (24).
Change in domestic prices according to equation (13).

Table 4. Earning-Elasticities.

	Sector	Total	GBA	Non GBA
Traded	Food & Beverages	**0.867** (7.202)	**0.995** (2.717)	**0.841** (6.889)
	Clothing	**0.985** (5.476)	**1.012** (7.142)	**0.934** (3.712)
	House Equipment & maintenance	**1.080** (7.815)	**1.070** (9.958)	**1.053** (5.072)
	Other Traded Goods	**0.899** (4.962)	**0.890** (8.716)	**0.860** (4.476)
Non-Traded	Housing	**0.945** (8.401)	**1.025** (4.070)	**0.924** (10.613)
	Transport & Communications	**1.134** (7.768)	**1.225** (4.023)	**1.096** (5.916)
	Leisure	**1.016** (9.52)	**1.041** (4.254)	**0.994** (10.743)
	Health and Education	**0.833** (6.004)	**0.919** (6.287)	**0.799** (5.535)

Elasticities in bold type, t statistics in brackets.

Table 5. Percentage Changes in Income

	Sector	Total	GBA	Non GBA
Industry	Food & Beverages	-4.15	-4.76	-4.02
	Clothing	-5.93	-6.10	-5.62
	House Equipment & maintenance	-5.62	-5.57	-5.48
	Other Traded Goods	-1.91	-1.89	-1.83
Services	Housing	-1.03	-1.12	-1.01
	Transport & Communications	-1.58	-1.71	-1.53
	Leisure	1.31	1.34	1.28
	Health and Education	-3.36	-3.71	-3.22

Changes in income result form the product among changes in prices from Table 1 and the elasticities from Table 2 according to equation (8).

Table 6. Poverty Measures

Indicator (%)	Before Trade Liberalisation			After Trade Liberalisation		
	Total	Non GBA	GBA	Total	Non GBA	GBA
HC	43.7	43.9	41.3	41.7	42.7	39.5
GI	21.2	22.4	18.6	18.5	18.8	18.1
FGT	14.8	16.8	10.7	10.6	10.7	10.2

HC= Head count ratio.
GI= Poverty gap indicator.
FGT= Foster-Greer-Thorbecke's indicator (α=2).

Table 7. Households Lifted from Poverty (% by sectors under analysis)

Sector	**Households**	**%**
Other Traded Goods	1667	2.2
Housing	32631	44.0
Transport & Communications	2361	3.2
Leisure	37438	50.5
TOTAL	**74097**	**100**

Table 8. Percentage Changes in Welfare (Average per Quintile of Income)

Quintile	Total	Non GBA	GBA
1	2.9	2.9	3.0
2	2.8	2.9	2.7
3	2.7	2.7	2.8
4	2.7	2.8	2.4
5	2.6	2.8	2.3

Quintiles ordered from lower to higher income.

Table 9. Changes in Household's Welfare (by sectors under analysis)

Welfare Reduced			**Welfare increased**		
Sector	Households	%	**Sector**	Households	%
Food & Beverages	453190	60.7	**Food & Beverages**	43979	0.9
Clothing	168484	22.6	**Other Traded Goods**	286273	5.6
House Equipment & maintenance	118389	15.9	**Housing**	1363447	26.6
Other Traded Goods	4474	0.6	**Transport & Communic.**	625563	12.2
Housing	2237	0.3	**Leisure**	2082315	40.6
			Health and Education	725933	14.2
TOTAL	**746774**	**100**	**TOTAL**	**5127510**	**100**


INSTITUTE OF DEVELOPMENT
POLICY AND MANAGEMENT


UNIVERSITY
OF ANTWERP