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# The welfare effect of the new wave of protectionism: The case of Argentina \*

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## Abstract

This paper studies the welfare impact of alternative scenarios of trade protectionism and liberalization in Argentina. The impact of the different trade policies is assessed in two different ways. We first use the multi-sectoral and multi-regional computable general equilibrium MIRAGE model to assess the effects of trade policy on GDP, exports, imports, terms of trade, real wages, and welfare. The second approach is to follow the trade and poverty literature and use the price and factor remuneration changes from each simulation to feed them into household survey data and assess the welfare effect on Argentine households. The simulations show that an increase in protectionism in a unilateral way has only short term benefits while the long run effects are negative. On the other hand liberalization scenarios tend to have short term negative effects but positive effects in the long run in particular when NTBs are considered. The analysis using household survey data shows that protectionism has negative long term effects across the entire income distribution and the effect is particularly severe for the poorest households. Liberalization scenarios improve households' welfare in the long run with a slight pro rich bias.

*Keywords:* CGE model, Microsimulations, Protectionism, Liberalization, Argentina.

*JEL Classification:* C68, F13.

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# 1 Introduction

At the onset of the current crisis, government of major economies pledged to refrain from protectionist policies. At least in tariffs terms most countries upheld their pledges. Tariff protectionism increased only for a small set of countries. However, trade volume collapsed following the crisis prompting several analysts to look for the causes beyond tariff barriers. Researchers have found an increased use of murkier forms of protectionism (Baldwin and Evenett, 2009). The findings of the Global Trade Alert reports indicate that countries have been proactive in implementing protectionist non-tariff measures (Evenett, 2010). Latin American countries have not been the exception in this trend. Argentina and Brazil are among the most prominent countries that have reverted to protectionism using a battery of non-tariff barriers. On the other hand, other countries in the region like Colombia and Peru have resisted the temptation to increase the level of protection.

The relationship between trade and development is in general complex and in Latin America the political support for a more or less restrictive trade regime has changed over time. The policy prescription of trade liberalization was popularized in the 1980s as recognition of the efficiency distortions generated by the import substitution industrialization strategy and the disappointing economic performance of the inward oriented Latin American countries in the 1960s and 1970s which contrasted with the success of the outward oriented East Asian Tigers. In this context, Argentina has not been an exception. Following a decade of liberalization that culminated with the economic, social, and political crisis of 2001, the ruling party has shifted progressively to protectionism. Cut out of international financial markets and with the economy in a severe recession, the first battery of measures targeted major agriculture exports as a way to increase fiscal revenues, earn foreign revenue, keep basic staple food affordable domestically and later on increase domestic processing. Following the 2008 crisis and its own domestic crisis, the Argentine government further extended the protectionist measures using a combination of tariff and non-tariff barriers. This has led to an intense internal debate over trade policy, diplomatic and commercial tensions with its Mercosur partners and several WTO disputes.

If free trade is good, then why do countries like Argentina interfere with free trade? Beyond the infant industry argument popularized by the import substitution model, it is important to recognize that trade produces winners and losers. Trade liberalization changes prices and will

require adjustments than in the short term may lead to unemployment and a lower level of economic activity. Also, in the short-run some countries can affect the terms of trade favorably increasing protection. However, these benefits may quickly disappear if other countries retaliate and close their economies.

In this paper, we study how protectionism may affect welfare in the short and long run in Argentina. We consider not only cases of unilateral increases of protectionism but also the possibility of retaliation from its trade partners. For comparison purposes, we also explore the welfare effect of increased liberalization. Our analytical methodology has two main parts. The first is a computable general equilibrium model of trade (Bchir et al., 2002a; Decreux and Valin, 2007). The model provides the tools needed to simulate the changes in the outcomes of interest such as welfare, GDP, exports, imports, terms of trade, factor remunerations and prices for different categories of goods in Argentina. Our simulations cover a large number of trade policy scenarios. The second component utilizes household surveys to assess the welfare impacts of those changes. We follow a standard first order effects approach, as in Deaton (1989, 1997). Using the microdata from the household surveys, we use expenditure shares and labor income shares to evaluate the income impacts of a given trade policy scenario across the entire income distribution in Argentina.

The rest of the paper is organized as follows. In the next section we review the protection trends in Argentina and we summarize the economic literature on the effects of the last financial crisis on the level of protectionism. The trade model features, the methodological approach to estimate households' welfare, the data and the protectionism and liberalization scenarios are described in Section 3. The results of the simulations are presented and discussed in Section 4, while household welfare analysis is discussed in Section 5. Finally, we give our final remarks and discuss the limitations of our modeling strategy in the last section.

## **2 Trade and Protection Patterns in Argentina during the crisis**

In contrast to the progress made during the multilateral negotiations at the WTO, the international financial crisis that started in 2008 resulted in a sustained increase of trade restrictions. The policies that governments around the world have been implementing in order to contain or reduce the harmful effects of the recession on the activity level and particularly on employment, can be

considered a double-edged sword given the constraints posed to imported inputs and the possible resources diversion from most efficient exporting sectors. This kind of decisions seems to forget that an important part of their countries demand is outside geographical borders. Changes in trade volumes and patterns, the available data on protection and a recent but growing economic literature on the effects of the crisis provide evidence of a protectionism trend at the world level and in particular in some large countries in Latin America like Argentina and Brazil.

Although we are tempt to compare the consequences of the present crisis to those of the 1930s one, neither the trade policies nor the international trade context are similar. Nowadays the increase in trade protection is constraint by WTO commitments and Free Trade Agreements, thus trade policy is taken other forms than simple tariffs. Applied tariffs have not recently changed due to international commitments, and even in many Latin American countries, such as Argentina and Brazil, they are far below to the bound-WTO average tariffs (i.e., bound tariffs in Argentina, Brazil and Colombia are on average 35% and in Peru it is 30%). Hence, these countries display a considerable scope to increase import tariffs without violating their WTO tariff commitments.

Table 1: Applied Tariff Protection: selected Importers from Latin America

Partners Importers	Developed countries			Developing countries			LDC countries		
	Agri	Manuf	Textile	Agri	Manuf	Textile	Agri	Manuf	Textile
<b>Argentina</b>	12.4	13.1	19.2	11.3	9.4	18.3	8.8	5.6	19.1
<b>Brazil</b>	11.7	12.6	18.1	9.6	8.4	18.1	9.5	1.1	15.0
<b>Colombia</b>	15.1	9.4	17.7	15.3	9.1	17.3	12.7	9.2	15.2
<b>Peru</b>	16.7	12.1	17.5	15.8	11.7	16.7	13.5	12.0	15.2

*Source:* MACMap-HS6-V3, CEPIL.

*Notes:* Protection data corresponds to equivalent ad valorem applied tariffs in Argentina, Brazil, Colombia and Peru over Agricultural and Manufactures (all and isolating Textile) products from Developed, Developing and LDC partners. These averages equivalent ad valorem are built using the reference group trade weighting scheme.

Many authors talk about “murky protectionism” because of measures that are very difficult to evaluate. Gamberoni and Newfarmer (2009) highlight that different kind of subsidies, even including “green” subsidies (Evenett and Whalley, 2009) are intensified in developed countries while not only tariffs but especially non-tariff barriers are mostly used by developing economies. For instance, Argentina has recently imposed non-automatic licensing requirements on auto-parts, textiles, TVs, toys, shoes and leather goods. Stronger rules, such as licensing arrangements and import controls (i.e., similar to the “Buy America” provision in the US), are provoking conflicts between Brazilian and Argentinean governments and the local private sectors threatening to erase the progress made

by Mercosur in the 1990s. Moreover, there have been a proliferation of anti-dumping measures in these Latin American countries, which mostly affect imports from Asia.

Empirical works (Henn and McDonald, 2011; Evenett, 2009) look for protectionism evidence mainly using the Global Trade Alert data because it provides a large varieties of trade instruments others than classical tariffs or subsidies with a large coverage at country and detailed product levels.

Table 2: Recent Measures restricting trade relations: selected importers from Latin America

Measures	Argentina			Brazil			Colombia			Peru		
	G	A	R	G	A	R	G	A	R	G	A	R
Bail out / state aid measure	1	5	7	0	0	1	0	0	0	0	0	0
Export subsidy	0	0	1	0	1	3	0	0	0	0	0	0
Export taxes or restriction	3	0	8	0	0	1	0	0	1	0	0	0
Import ban	0	1	2	0	0	0	0	0	0	0	0	0
Investment measure	1	0	1	2	0	2	0	1	0	0	0	0
Local content requirement	0	0	1	0	0	2	0	0	0	0	0	0
Migration measure	0	0	0	1	0	0	1	0	0	0	0	0
Non tariff barrier (others)	0	5	74	0	2	0	0	0	0	0	0	0
Other service sector measure	0	0	0	1	0	0	0	0	0	0	0	0
Public procurement	0	0	0	0	0	4	0	0	0	0	0	0
Quota (including TRQs)	1	0	1	3	1	2	0	0	0	0	0	0
State-controlled company	0	0	1	1	0	0	0	1	0	0	0	0
Tariff measure	3	1	6	53	2	24	3	1	0	1	0	0
Technical Barrier to Trade	0	1	2	0	0	0	0	0	0	0	0	0
Trade defence measure	7	15	38	5	28	19	2	3	1	5	7	4
Trade finance	0	0	0	0	3	1	0	0	0	0	0	0
	<b>16</b>	<b>28</b>	<b>142</b>	<b>66</b>	<b>37</b>	<b>59</b>	<b>6</b>	<b>6</b>	<b>2</b>	<b>6</b>	<b>7</b>	<b>4</b>

*Source:* Global Trade Alert, June 2012. *Notes:* Data corresponds to the number of measures recently detected by the GTA in Argentina, Brazil, Colombia and Peru. They are classified by type and according to their degree of market distortion (i.e., Red (R), Amber (A) and Green (G)).

Latin American countries show different patterns of protection (see tables 1 and 2). Even if comparing tariffs we find that trade protection is quite homogeneous across countries and products, other measures display a greater difference between Argentina and Brazil on one side, and Colombia and Peru on the other. Argentina has recently increased the number of very distorting measures (classified as red in the table), particularly focusing on non-tariff barriers (e.g., non-automatic licenses and other administrative and customs restrictions) and also on anti-dumping duties. Brazil follows its Mercosur partner with less than a third of the implemented restrictions classified as red measures, which mainly consists in tariffs and other safeguards and anti-dumping measures. Finally, Colombia and Peru have oriented their trade protection to trade defense measures from which only few of them are considered part of the red box.

Bussiere et al. (2011) find that even though the number of measure have been rising after 2008 (Global Trade Alert source), the economic impact remains moderate. Treaties and trade agree-

ments limit tariffs increase. However, nowadays, the pressure for further protectionism measures is growing due to the vulnerable macroeconomic context, unemployment risk and the widening external imbalances. The problem is that protectionism may only increase these imbalances and in the long-run depress real GDP growth and competitiveness. This seems to be the case of Argentina nowadays.

Kee et al. (2010) also evaluate trade protection through the overall trade restrictiveness indices calculated for a wide range of countries by comparing tariff schedules from 2008 and 2009. The non relevant increase of tariffs (except in some particular countries such as Argentina or Russia and in some particular products, such as in the automobile sector) and particularly the increase in anti-dumping measures only explained a negligible part of the observed trade collapse after the crisis. Thus, non-tariff measures such as bailouts and local content requirements to discriminate against imports could be one of the main factors explaining the trade fall.

Yi (2009) also points out that protectionism could be an obstruction on supply chains in a context where products are not anymore produced in only one country but being the result of an international network (i.e., nations are different nodes from a supply chain). Hence, the increase in trade barriers can thus trigger the “domino effect” in global trade collapse. Moreover, during the last ten years competitiveness in some exporting sectors were developed thanks to lower costs of imported inputs. The present protectionism trend only could erode this competitiveness and thus negatively affects economic activity and local jobs. In the same line of thought, Gawande et al. (2011) find that the rise in the intra-industry trade (varieties) and the fragmentation of production across global value chains (“vertical” specialization in different intermediate outputs and procedures) have also contained the pressure to a trade protection increase. These are possible consequences to keep in mind for Argentina and other Latin American countries because their past efforts to open their markets allowed them to developed some manufacturing sectors and the potential increase in import restriction could deteriorate that competitiveness reached some years ago.

During the first phase of the crisis, growth and employment remained strong in Argentina and its neighboring countries. However, in the last few quarters, unemployment and economic recession risk have been increasing in the region, and therefore the pressures for protectionism have intensified. Hence, retaliation and its worst economic and social effects remain latent (Gregory et al., 2010).

## 3 The methodological approach

### 3.1 *The MIRAGE model*

We use the multi-sectoral and multi-regional dynamic computable general equilibrium (CGE) MIRAGE model (Bchir et al., 2002a; Decreux and Valin, 2007), which has been developed and is used extensively to assess trade liberalization scenarios (e.g., Bchir et al., 2002b; Bouët et al., 2005, 2007; Decreux and Fontagné, 2008).

The demand side is modeled for each region through a representative agent, who saves a fixed part of his income and the rest of it is spent on commodities according to a LES-CES function. Products are distinguished according to their geographical sources (Armington, 1969), using the GTAP (Global Trade Analysis Project) Armington elasticities estimated in Hertel et al. (2007). That is domestic products are assumed to benefit from a especial status for consumers, making them less substitutable by foreign goods. Moreover, manufactured products originating from developing and developed countries are assumed to be less substitutable between each other because they belong to different (price or) quality ranges and thus, competition among differentiated goods is less tough than between similar products.

On the supply side, each sector is modeled as a representative firm, which combines value-added and intermediate consumption in fixed shares. Intermediate consumption from the different sectors is aggregated using a nested Constant Elasticity of Substitution (CES) function, such as the one for the final consumption goods. Value-added is a bundle of imperfectly substitutable primary factors (capital, skilled and unskilled labor, land and natural resources). Installed capital stock is immobile while investment adjusts across sectors according to their capital returns. Skilled labor is perfectly mobile across sectors and the value-added modeling takes into account its complementarity with capital. Unskilled labor is imperfectly mobile between agricultural and other sectors. Land is assumed to be imperfectly mobile between agricultural sectors and finally, natural resources are sector specific. All primary factors are in fixed supply. Moreover, production factors are assumed to be immobile internationally and fully employed. Hence, negative shocks are absorbed by changes in prices rather than in quantities.

MIRAGE has a sequential dynamic recursive set-up and imperfect competition modeling. We as-



sume constant returns to scale and perfect competition in agriculture, energy, primary and services sectors, while firms in sectors which provide manufactured goods are assumed to face increasing returns to scale and imperfect competition (see sectors distinguished by \* in table 3). The model version used for this article (MIRAGE-e) shows an improved modeling of the energy sector, where the different sources of energy are imperfectly substitutes according to their uses. The macroeconomic closure assumes on one side, that investment is saving-driven and on the other, that the current account balance is assumed to be exogenous (regional shares in the global current account yearly projected from MaGE, (Fouré et al., 2010)) while real exchange rates adjust.

Since tariff structures in Latin American countries contain low tariffs and quite homogeneous levels across products, trade restrictiveness mainly comes from non-tariff barriers (NTB) and other trade costs related to time. In order to consider different modalities of trade protection/liberalization for those countries, we take into account trade costs that add up to the ordinary freight costs already present in the model - iceberg cost fashion (Decreux and Fontagné, 2008, 2011). We will see that trade facilitation gains are quite significant that could outweigh any costs in the short-run. Finally, protection in services has been introduced in two different forms depending on sectors: in communication and transport it is modeled as an export tax and thus it benefits exporting countries by allowing some firms to increase their profit margins; in other services it is modeled as an additional iceberg trade cost.

### **3.2 *Micro simulations***

A useful way to study how trade affects households' welfare is by noticing that trade and trade policy affect the prices faced by producers and consumers. In consequence, we can investigate the trade-welfare link by tracing how trade policy affects prices and, in turn, how prices affect welfare. The framework builds on standard agricultural household models, as in Singh et al. (1986), which we will modify to take into account that we will be dealing with urban households in middle income countries and therefore most households will be wage earners and will not produce agriculture goods. The unit of analysis is the household, denoted by  $h$ . To measure welfare changes, we begin by adopting the indirect utility function approach, as in Deaton (1997). We would later derive the same result using the expenditure function as in Dixit and Norman (1980) where we will incorporate

Table 3: Sector and country aggregation

Regions	Sectors
<b>Developed countries</b>	<b>Food and Beverages</b>
EU27	Rice
NAFTA	Wheat
Cairns Developed Countries	Cereals
Rest of Developed Countries (Japan)	Vegetables and Fruits
	Oil seeds
	Sugar
	Crops
	Meat Cattle
	Other Meat
	Milk
	Fishing
	Fats (*)
	Dairy products (*)
	Food and Beverages (*)
<b>Developing countries</b>	<b>Clothing</b>
Argentina	Wool
Andean Community	Textile (*)
Brazil	
China and Hong Kong	
India	
Russia, Ukraine and Rest of ExURSS	
Mediterranean Countries	
Sub Saharan Africa	
Cairns Developing Countries	
Rest of Latin America	
Rest of Developing Countries	
	<b>House Equipment</b>
	Furniture (*)
	Chemicals (*)
	Electronic devices (*)
	Machinery (*)
	<b>Others</b>
	Forestry
	Primary
	Metal (*)
	Other Manufactures (*)
	Other Services
	Financial and Business Services
	<b>Housing, Transport and Communication</b>
	Coal
	Oil
	Gas
	Petrol and Coal products
	Cars and Trucks (*)
	Transport Equipment (*)
	Electricity
	Housing
	Transport
	Communication
	<b>Health and Education</b>
	Health
	Education
	<b>Leisure goods</b>
	Paper (*)
	Leisure goods

*Notes:* Classification based on Latin American blocs, their trade partners and their main tradable products. We built a correspondence table with products disaggregation in household surveys.

(\*) Sectors with increasing returns to scale and under imperfect competition conditions.

the effects of labor income.

The indirect utility function of household  $h$  depends on a vector of prices  $\mathbf{p}$  and on household income  $y^h$ :

$$V^h(\mathbf{p}, y^h) = V^h\left(\mathbf{p}, x_0^h + \sum_j \pi_j^h(p_j)\right), \quad (1)$$

where the vector  $\mathbf{p}$  comprises consumer prices for all goods. In this equation household income comprises profits from the production of goods  $j$ ,  $\pi_j^h(p_j)$ , and exogenous income,  $x_0^h$ .

Let us consider now the impacts of changes in the price of commodity  $i$ . The short-run impacts on the household can be derived by differentiating the indirect utility function.

Using Roy's identity and Hotelling Lemma we get that the welfare impact of a price change depends on the difference between the production and the consumption level of the household.

$$\frac{\partial V^h}{\partial p_i} = \frac{\partial V^h}{\partial y^h} (q_i^h - c_i^h) \quad (2)$$

In order to be able to take the framework to the data, we need some manipulation. In short, multiply and divide by  $p_i$  and by total household income  $y^h$  to get

$$\frac{\partial V^h}{\partial \ln p_i} = \frac{\partial V^h}{\partial \ln y^h} (\phi_i^h - s_i^h). \quad (3)$$

The left-hand side is the object we are trying to measure. On the right-hand side,  $\frac{\partial V^h}{\partial \ln y^h}$  is the marginal utility of money to individual  $h$ ;  $\phi_i^h$  is the share of household income derived the production of good  $i$ , and  $s_i^h$  is the budget share spent in good  $i$ . In Deaton (1989, 1997), the quantity  $\phi_i^h - s_i^h$  is the net benefit ratios which, for policy, is what we care about. In fact,  $\phi_i^h - s_i^h$  is the the money equivalent of the losses or gains for different households.

We can now turn to the interpretation of this equation. Households are affected both on the consumption and on the income sides. On the consumption side, consumers are worse off if prices go up but are better off if prices go down. In a first order approximation, these impacts can be measured with budget shares,  $s_i$ . On the income side, there is also a direct impact on profits, if the household produces goods  $i$ , which depends on the share of income attributed to these goods,  $\phi_i$ .

In rural economies, this source of income can account for a large fraction of total income. In more urbanized economies with more developed labor markets (as in many places in Latin America), the role of the direct production of (agricultural) goods will be much less important. Our welfare evaluation will take into account urban households in Argentina, an upper-middle income country, and therefore from now on we will treat  $\phi_i^h$  as zero for all households.

In a small open economy that faces exogenous commodity prices, wages will respond to changes in those prices mainly because the demand for labor depends on prices. It is relatively simple to amend the theoretical framework to account for these responses. We begin with wage adjustments. To illustrate them, we work with the expenditure function approach, as in Dixit and Norman (1980). As before, the unit of analysis is the household, denoted by  $h$ . In equilibrium, household expenditures (including savings) have to be financed with household income (including transfers).

$$e^h(\mathbf{p}, u^h, \mathbf{x}^h) = \sum_j w^j + \sum_i \pi_i^h(\mathbf{p}, \psi) + T^h + x_0^h. \quad (4)$$

The expenditure function  $e(\cdot)$  of household  $h$ , on the left hand side, is defined as the minimum expenditure needed to achieve a given level of household utility  $u^h$ . Income comprises the sum of the wages of all working members  $j$  ( $w^j$ ) and the sum of the profits  $\pi_i$  made in different economic activities  $i$ . Profits include, for instance, the net income from agricultural production or farm enterprises. They depend on prices, technical change and key household characteristics (summarized by  $\psi$ ). It is evident from equation (4) that household welfare depends on equilibrium variables such as prices and wages (that affect household choices) and also on household endowments. For instance, household consumption depends on the prices of consumer goods and household income depends on the labor endowment (skilled, unskilled), the wage rate, and the prices of key outputs. It follows that changes in commodity prices affect welfare directly via consumption and production decisions, and that these impacts are heterogeneous insofar as they depend on household choices and endowments. In addition, there are short-run impacts, when households do not adjust, medium-run impacts, when households make partial adjustments, and long-run impacts, when growth, investments, and long-run choices have taken place.

The first order impact of changes in the price of good  $i$  can be derived by differentiating equation (4) (while keeping utility constant and adjusting  $x^h$ ). It follows that

$$cv^h = \left( \phi_i^h - s_i^h \right) d \ln p_i^h + \sum_j \theta^j \varepsilon w_i^j d \ln p_i^h, \quad (5)$$

where  $cv = -dx_o/e$  is a measure of the compensating variation (as a share of initial expenditures) associated with a change in the  $i$ th price. In equation (5),  $s_i$  is the budget share spent in good  $i$ ,  $\phi_i$  is the share of household income from the production of good  $i$  (assumed zero in our empirical framework),  $\theta^j$  is the share of the wage income of member  $j$  in total household income, and  $\varepsilon w_i^j$  is the elasticity of the wage earned by household member  $j$  with respect to the price  $p_i$ .

Equation (5) summarizes the first-order impacts of a price change. The first term on the right hand sides re-established the net-consumer/net-producer result, as before. Now, price changes also affect wages. This channel is described by the second term on the right hand side of equation (5). The mechanisms are in principle simple. When there is a price change, labor demand for different types of labor (and also labor supply) can change, thus affecting equilibrium wages. In equation (5), these responses are captured by the elasticities  $\varepsilon w_i^j$ , which will vary from one household member to another provided different members are endowed with different skills (unskilled, semi-skilled or skilled labor) or if they work in different sector (industry premia). These impacts on labor income depend on the share of income contributed by the wages of different members,  $\theta^j$ .

Clearly, if countries differ in technologies, endowments, or labor regulations, the responses of equilibrium wages to prices can be heterogeneous across different economies.

In the presence of wage adjustments, the standard net-consumer/net-producer proposition needs to be modified. The total welfare effect will come from the evaluation of:

$$cv^h = \left( -s_i^h \right) d \ln p_i^h + \sum_j \theta^j \varepsilon w_i^j d \ln p_i^h, \quad (6)$$

### 3.3 Data

#### 3.3.1 GTAP and Protection data

The MIRAGE model is calibrated on the GTAP dataset version 7 release 1, with 2004 as base year. Our data aggregation isolates key sectors in Argentina (e.g., Meat, Crops, Cars, etc) which also match with goods disaggregation from households surveys.

For the regional aggregation, we retain the main developed regions (e.g., the EU and NAFTA) and large Latin American countries (e.g., Brazil and Argentina). The rest of the world is aggregated according to their trade relationship with Argentina (e.g., Cairns group, China and Hong Kong, Rest of Latin America) such as is shown in table 3.

Tariffs affecting goods are also taken from GTAP which uses the Market Access Maps (MAcMap-HS6) dataset version 2 in its last update version. The *ad-valorem* equivalent (AVE) tariffs have been aggregated at the GTAP level using the reference group weighting scheme developed for MAcMap (Bouët et al., 2008). Tariff equivalents of regulatory barriers to trade in services are calibrated using recent estimates from Fontagné et al. (2011).

Data to calibrate NTB in goods is based on Kee et al. (2008) estimates at the HS6 level, which are aggregated up to the GTAP level using a trade weighting scheme. NTB in service sectors are calibrated using estimates from a simple gravity model. Trade costs associated to time (i.e., customs procedures, time at the port, transportation, etc) have been calibrated using a database provided by Minor and Tsigas (2008). Minor and Tsigas (2008) provide a measure of the daily cost of time as a percentage of the value of the good. Detailed data is then aggregated at the GTAP level following a trade weighted scheme.

#### 3.3.2 Household Data

For microsimulations we use two sources of data for Argentina, the household expenditure survey and the permanent household survey. The National Household Expenditure Survey (ENGH) contains data on consumption at the household level. In Argentina, the consumption classification involves nine groups of goods. These nine groups are Food and Beverages, Clothing, Housing, House Equipment, Entertainment, Education, Health, Transport and Communication, Other Goods and

Services. The National Institute of Statistics and Censuses (INDEC) constructs price indexes for these consumption goods. The ENGH Survey, conducted from March 1996 to March 1997<sup>1</sup>, provides information on household monthly expenditure on over ninety goods. The ENGH is a comprehensive survey that covers over 21,127 households (once outliers are eliminated) across urban areas in Argentina. Some basic features of the data are as follows. The mean household per capita expenditure in Argentina during 1996/1997 was 251.2 dollars per month, with a standard error of 246 dollars. Argentine households spent, on average, 47% of their budget on Food and Beverages. Housing, Transport and Communication accounted for 20.9% of the budget while Other Traded Goods accounted for another 8.5%. 7.8% of the average budget went to Clothing, 6.3% was spent on Health and Education and 5.7% was spent on Leisure Goods. Finally, 3.7% of total household expenditure was allocated to House Equipment and Maintenance Goods. The second source of data for Argentina is the permanent household survey, Encuesta Permanente de Hogares (EPH). These surveys are collected in May and October in each year and are the main source of labor market information in the country. In this paper we use the October 2004 survey. The key insight of the empirical methodology is to use the wage data in the EPHs with the consumption budget share of the different categories of goods from the ENGH, combined with price and wage changes in each of the simulation in the model to estimate total household welfare in Argentina.

### 3.4 *Simulated scenarios*

The MIRAGE model calibration data describes the 2004 economy. However, it is known how the world economy has behaved over the period 2004-2010 and we have introduced those changes by running a pre-experiment in our reference baseline (e.g., the end of the Multi-Fiber Agreement in 2005). The dynamic reference baseline over the whole period is defined by the projected trajectory of the world economy up to 2030 using a three-factor (labor, capital, energy) growth model (Fouré et al., 2010). Since then each scenario is linearly implemented until 2020.

Given that the dynamic version of the MIRAGE model allows for long-run analysis of simulations, we will focus on the short/medium-run and the long run effects to compared them according to impacts of the trade policy scenarios.

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<sup>1</sup>INDEC conducted a new expenditure survey in 2004/2005 but the results of this survey are not publicly available.

We will run many alternative scenarios of protectionism and liberalization (see table 4) that mainly concern Argentina. Scenarios based on protectionism hypothesis are nowadays the most relevant to discuss given the present trade policy decisions that have been taken by the Argentine government and many other governments worldwide. However, liberalization scenarios appear as an alternative choice under the present international context of crisis. Thus, we will compare both protectionism and liberalization scenarios under different assumptions of unilateral versus multilateral changes in the trade policy, higher protection with and without retaliation, and tariff only versus the case where NTBs are also affected.

Starting with protectionism scenarios we built four different options for Argentina. The first scenario concerns the increase in trade protection as a unilateral decision of Argentina. This scenario has been run under two different modalities: the first one assumes an increase of present applied tariffs to the bound duties at the WTO (i.e., 35% in Argentina); and the second modality adds a 10% increase in NTBs. Since a unilateral increase in protection can incentive the reactions of trade partners, we have run two extra scenarios that concern the possibility that other trade partners retaliate, i.e., back to protectionism by Argentina trade partners (e.g., Brazil, EU27, China) and at the multilateral level only assuming a 10% increase in NTBs in both scenarios to avoid violating countries' WTO commitments.

Table 4: Description of scenarios

Scenarios	Modalities		
	Tariffs	NTBs	
Protectionism			
Unilateral increase (a)	up to 35% (Arg. bound tariff level)		
Unilateral increase(b)	up to 35% (Arg. bound tariff level)	10% increase in Arg.	
Trade Partners' increase	up to 35% (Arg. bound tariff level)	10% increase in Arg. and partners	
World increase	up to 35% (Arg. bound tariff level)	10% increase in the world	
Liberalization			
Unilateral reduction (a)	-50% reduction in Arg.		
Unilateral reduction (b)	-50% reduction in Arg.	-10% reduction in Arg.	
Multilateral liberalization (a)	-50% reduction in the world		
Multilateral liberalization (b)	-50% reduction in the world	-10% reduction in the world	

These protectionism scenarios will be compared to the alternative liberalization scenarios simulated on a unilateral (Argentina) and multilateral basis. Each liberalization scenario will be also run assuming different modalities of liberalization: modality (a) assumes only tariff reduction (-50%), modality (b) also reduces NTBs (-10%).



## 4 Trade Policy: Simulation Results

In this section, we present and discuss the results of simulated scenarios described in the previous section. Even if the CGE model provides us results for all regions in the world, we will only focus on the Argentinean situation under different scenarios of protectionism compared to the alternative choice of trade liberalization. The variables we will analyze focus on welfare analysis i.e., welfare and its decomposition, aggregated trade and terms of trade, skilled and unskilled labor remuneration and domestic consumption prices for all sectors according to the correspondence presented in table 3. Macroeconomic and welfare changes will be presented in tables 5 and 7, and changes in consumption prices are displayed on tables 6 and 8. These results will be presented for 2020 (end of implementation of the trade policy shocks) and for 2030 that represents the long run. Changes in wages and consumption prices in Argentina (2030) will become the inputs for microsimulations to evaluate welfare at the household level.

### 4.1 *Coming back to Protectionism: only Short-run Gains*

Even if these protectionism scenarios are quite extreme, they are not really far from the current trend not only in Argentina but also in many countries of the world as a consequence of the recent international crisis. The formulation of protectionism scenarios does not violate the WTO commitments (i.e., Argentina's tariff are increased until its bound level) but they do not take into account current FTAs. Moreover, other modalities of protectionism also take into account the increase in other types of protection such as no-automatic licenses and other administrative restrictions (NTBs and transaction costs), which have been also simulated in scenario (b) of Argentina's unilateral protection increase and also on those scenarios where we assume retaliation by Argentina's trade partners and even by the whole world.

Assuming that Argentina intensifies unilaterally its import restrictions (see table 5, Unilateral increase, (a)), the macroeconomic effects slightly differ across the modalities of implementation; however, throughout the period of analysis (between 2020 and 2030) we find that shocks differently affect the results. A tariff increase to its bound level (i.e., 35% for this country) improves national welfare only in the medium term while in the long run those gains disappear. An increase in protection distorts the use of the resources (i.e., losses in terms of allocative efficiency, capital accumulation,

Table 5: Argentina - Protectionism

	Unilateral Increase				Trade Partners Increase		World increase	
	(a)		(b)					
Variable	2020	2030	2020	2030	2020	2030	2020	2030
<b>GDP (vol)</b>	-0.72	-1.01	-0.79	-1.13	-0.88	-1.23	-0.89	-1.25
<b>Exports (vol _ no intra)</b>	-40.72	-39.29	-41.58	-40.16	-42.60	-41.12	-42.72	-41.28
<b>Imports (vol _ no intra)</b>	-27.54	-28.32	-28.88	-29.69	-29.64	-30.46	-29.72	-30.58
<b>Terms of trade</b>	11.40	10.98	10.63	10.21	10.97	10.52	11.02	10.57
<b>Skilled real wages</b>	-0.02	-0.66	-0.17	-0.88	-0.23	-0.98	-0.23	-0.99
<b>Unskilled real wages</b>	-2.58	-2.67	-2.67	-2.80	-2.73	-2.88	-2.74	-2.90
<b>Welfare</b>	0.49	-0.04	0.35	-0.23	0.27	-0.33	0.26	-0.35
<b>Welfare decomposition</b>								
<i>Allocation efficiency gains</i>	-1.23	-1.37	-1.25	-1.40	-1.31	-1.46	-1.32	-1.47
<i>Capital accumulation gains</i>	-0.29	-0.54	-0.33	-0.62	-0.33	-0.64	-0.33	-0.64
<i>Land supply gains</i>	-0.07	-0.08	-0.07	-0.08	-0.07	-0.08	-0.07	-0.08
<i>Other gains</i>	0.70	0.75	0.68	0.73	0.71	0.76	0.71	0.76
<i>Terms of trade gains</i>	1.44	1.27	1.35	1.19	1.37	1.21	1.37	1.21
<i>Trade-cost gains (exporter)</i>	0.00	0.00	0.00	0.00	-0.06	-0.06	-0.07	-0.07
<i>Variety gains</i>	-0.06	-0.08	-0.04	-0.06	-0.04	-0.06	-0.04	-0.06

Notes:

(a) Only Tariffs elimination.

(b) Tariffs and NTBs elimination.

land use and even on varieties from sectors under imperfect competition conditions) and thus, the main source of welfare gains in the short run is the improvement in the terms of trade due to the trade policy change. At the same time and in the medium term, GDP starts decreasing and as it is expected, the GDP would decrease even further in the long run because of the disincentives for capital accumulation.

The increase in the level of custom duties reduces total imports in Argentina as it was expected. Moreover, a greater national trade protection strongly impact on domestic consumption prices. Even if consumption prices increase for all products, they are not affected in the same proportion. Lower prices changes would be observed in sectors where Argentina displays a comparative advantage such as for wheat and oilseeds, and higher price changes particularly would affect manufactures related to house equipment that are often imported in Argentina (i.e., electronic devices, chemicals and machinery). Consumption prices maintain the same trend all over the period such as for the rest of prices on the economy. Since this model's external closure assumes a constant current account balance, exports also decrease and the real exchange rate appreciates (i.e., 13.13% in 2020 and 12.65% in 2030). As expected, production and trade impacts at the sectoral level show that relative protection is stronger over manufactured sectors (e.g., in electronic and transport equipments), than on the most traditional sectors in Argentina (i.e., oilseeds, rice or meat). These initial discrepancies

in protection across sectors leads to higher percentages of reduction in the agricultural production due to reallocation of production factors to industrial sectors.

The real return to the owners of productive factors would decrease but in this scenario skilled labor is less affected as they are mostly employed in industrial sectors and their real wages would only see a reduction -0.02% in 2020 and -0.66% in 2030. The rest of factors (unskilled labor, capital, land and natural resources) are strongly and negatively affected in their purchasing power.

In the case of increasing Argentina import protection through more restrictive non-tariff barriers (see table 5, Unilateral increase, (b)), national welfare also improves in 2020 while it deteriorates in 2030. A higher protection through NTBs and trade costs reduces terms of trade gains and intensifies the distortion in the allocation of resources, even if the welfare loss due to varieties decreases. The reduction in GDP is deeper than under the previous scenario. Moreover, this welfare loss at the national level reflects that none of the production factors benefits from an improvement of their purchasing power. Real returns of all factor decrease, affecting mostly the owner of natural resources, land and also the wage of unskilled workers (e.g., -2.67% in 2020 and -2.8% in 2030). Consumption prices also increase in all sectors as it was the case in the previous scenario without remarkable differences in percentage variations due to the increase in Argentinean NTBs. Argentinean export and imports also decrease while the real exchange rate suffers a greater appreciation (e.g., 13.55% in 2020 and 13.09% in 2030).

The decision of Argentina to increase the level of trade protection may lead to some sort of retaliation by both, its major trading partners and the whole world. For that reason we simulate two alternative scenarios where retaliation becomes effective through a 10% increase of the NTBs that affect products exported by Argentina. Under both scenarios with retaliation the Argentina's welfare gain in 2020 is cut in almost half compared to the previous scenarios and the negative impact in the long run is larger. Even if terms of trade gains remain at the same level of the previous scenarios other sources of welfare variation affect negatively the country (i.e., welfare losses linked to trade costs for Argentina as exporter due to the increase in NTBs by its trade partners). Consumption prices also increase but comparing with the unilateral increase in tariffs and NTBs scenario, retaliation moderate those changes. GDP and trade reductions become larger and as it is expected, the losses in terms of purchasing power for all production factors become larger too. Of course, none of these two scenarios are desirable neither for Argentina nor for the rest of the world.

Table 6: Argentina - Protectionism and Prices

Sector	Unilateral Increase				Trade Partners Increase		World Increase	
	(a)		(b)		2020	2030	2020	2030
	2020	2030	2020	2030				
<b>Food &amp; Beverages</b>	<b>13.26</b>	<b>12.91</b>	<b>13.71</b>	<b>13.39</b>	<b>13.34</b>	<b>13.03</b>	<b>13.29</b>	<b>12.96</b>
<i>Rice</i>	10.27	9.85	10.56	10.16	10.21	9.79	10.17	9.73
<i>Wheat</i>	5.71	4.99	5.90	5.17	5.68	4.95	5.65	4.91
<i>Cereals</i>	8.11	7.10	8.37	7.34	8.09	7.07	8.05	7.01
<i>Vegetables &amp; Fruits</i>	10.16	9.58	10.65	10.06	10.31	9.72	10.26	9.65
<i>Oil seeds</i>	6.33	6.47	6.55	6.72	6.10	6.25	5.94	6.02
<i>Sugar</i>	11.92	11.56	12.31	11.96	11.90	11.55	11.85	11.48
<i>Crops</i>	14.09	14.06	14.32	14.26	14.02	13.97	13.97	13.89
<i>Meat Cattle</i>	11.40	10.83	11.76	11.20	11.35	10.78	11.29	10.70
<i>Other Meat</i>	12.18	11.58	12.51	11.91	12.15	11.56	12.10	11.48
<i>Milk</i>	9.70	9.34	9.99	9.65	9.61	9.26	9.55	9.17
<i>Fishing</i>	9.85	8.59	10.17	8.84	9.74	8.39	9.67	8.31
<i>Fats</i>	13.49	12.93	13.91	13.35	13.35	12.89	13.19	12.69
<i>Dairy products</i>	13.09	12.73	13.51	13.18	13.11	12.77	13.05	12.69
<i>Food-Beverages</i>	13.26	12.91	13.71	13.39	13.34	13.03	13.29	12.96
<b>Clothing</b>	<b>16.66</b>	<b>18.12</b>	<b>17.34</b>	<b>18.83</b>	<b>17.00</b>	<b>18.49</b>	<b>16.96</b>	<b>18.44</b>
<i>Wool</i>	6.51	4.64	6.73	4.80	6.30	4.39	6.20	4.20
<i>Textile</i>	16.69	18.16	17.37	18.87	17.03	18.53	16.99	18.48
<b>House Equipment</b>	<b>18.71</b>	<b>18.16</b>	<b>19.55</b>	<b>18.99</b>	<b>19.28</b>	<b>18.73</b>	<b>19.25</b>	<b>18.69</b>
<i>Furnitures</i>	15.50	15.19	16.00	15.74	15.61	15.36	15.56	15.30
<i>Chemicals</i>	17.70	17.19	18.53	17.97	18.25	17.70	18.21	17.65
<i>Electronic devices</i>	21.35	20.77	22.20	21.63	21.99	21.43	21.97	21.40
<i>Machinery</i>	21.56	20.77	22.63	21.83	22.47	21.66	22.45	21.63
<b>Others (goods &amp; services)</b>	<b>14.03</b>	<b>13.66</b>	<b>14.46</b>	<b>14.15</b>	<b>14.02</b>	<b>13.72</b>	<b>13.97</b>	<b>13.65</b>
<i>Forestry</i>	11.31	8.60	11.71	8.91	11.31	8.54	11.26	8.47
<i>Primary</i>	15.69	15.25	16.23	15.79	15.85	15.40	15.81	15.34
<i>Metal</i>	16.94	16.18	17.51	16.72	17.15	16.35	17.11	16.29
<i>Other Manufactures</i>	16.00	15.67	16.70	16.38	16.37	16.06	16.33	16.00
<i>Other Services</i>	13.67	13.33	14.10	13.83	13.65	13.39	13.60	13.32
<i>Financial &amp; Business Services</i>	14.92	14.41	15.33	14.87	14.90	14.44	14.85	14.37
<b>Transport, Com. &amp; Housing</b>	<b>13.96</b>	<b>13.53</b>	<b>14.41</b>	<b>14.00</b>	<b>13.98</b>	<b>13.57</b>	<b>13.93</b>	<b>13.51</b>
<i>Coal</i>	34.60	34.55	34.61	34.55	34.60	34.55	34.60	34.55
<i>Oil</i>	8.55	8.26	8.83	8.52	8.33	8.01	8.28	7.95
<i>Gas</i>	13.39	14.02	13.84	14.48	13.37	13.99	13.32	13.93
<i>Petrol and Coal products</i>	10.36	9.92	10.71	10.26	10.22	9.77	10.17	9.70
<i>Cars &amp; Trucks</i>	22.01	21.95	23.32	23.17	23.16	23.05	23.13	23.00
<i>Transport Equipment</i>	21.11	20.26	21.82	20.97	21.54	20.67	21.51	20.62
<i>Electricity</i>	13.99	13.65	14.37	14.04	13.93	13.58	13.88	13.52
<i>Housing</i>	12.92	12.48	13.34	12.93	12.88	12.47	12.83	12.40
<i>Transport</i>	14.92	14.40	15.30	14.81	14.88	14.38	14.83	14.32
<i>Communication</i>	15.06	14.50	15.45	14.95	15.03	14.53	14.98	14.46
<b>Health &amp; Education</b>	<b>14.05</b>	<b>13.24</b>	<b>14.40</b>	<b>13.58</b>	<b>13.94</b>	<b>13.10</b>	<b>13.88</b>	<b>13.02</b>
<b>Leisure</b>	<b>14.79</b>	<b>14.18</b>	<b>15.21</b>	<b>14.62</b>	<b>14.79</b>	<b>14.19</b>	<b>14.73</b>	<b>14.13</b>
<i>Paper</i>	15.68	15.28	16.34	15.94	15.99	15.59	15.94	15.53
<i>Leisure goods</i>	14.79	14.18	15.21	14.62	14.79	14.19	14.73	14.13

Notes:

(a) Only Tariffs elimination.

(b) Tariffs and NTBs elimination.

In short, we can say that among all protectionist scenarios, the unilateral decision of protection in the case of Argentina provides only short-run welfare gains which dissipate in the long run because of the reduction in capital investment and retaliation makes that Argentina's outcomes become even worst.

## 4.2 *Liberalization: Cut in tariffs is not enough*

When considering the trade liberalization scenarios, a unilateral tariff cut in Argentina shows the opposite results to the one from the unilateral protection scenario. Eliminating tariffs (table 7, Unilateral reduction, (a)) reduces welfare in the short run through the deterioration of the terms of trade and some national varieties are lost due to the increase in competition. However, the elimination of these sources of market distortions improves efficiency in terms of the resources allocation, capital accumulation and land use. This liberalization scenario improves real returns to all factors (e.g., real wages increase 0.22% for skilled labors and 0.26% for unskilled labors in 2030). Consumption prices decrease for all products under a unilateral liberalization particularly in those sectors where local production greatly compete with imports (e.g., textiles, electronic devices, machinery). Total Argentinean trade flows increase under this scenario and the real exchange rate depreciates (e.g., -1.01% in 2030).

Introducing the elimination of NTBs and improving trade facilitation conditions (table 7, Unilateral reduction, (b)), Argentina's welfare improves. The reversion on the welfare change is due to lower terms of trade losses but specially to the increase in capital accumulation gains. Consumption prices strongly fall thank to the reduction in Argentina's NTBs. Thus, purchasing power for factor owners almost double specially for both skilled and unskilled workers.

Finally, the multilateral full trade liberalization scenario (only tariff cuts) only reduces Argentinean welfare in the short run while in the long run it incentives capital accumulation leading to a welfare improvement (0.04%) and a greater GDP growth (0.3%). Even if for the seven categories of aggregated consumption products prices are reduced, we can find some sectoral differences looking at the details. Consumption prices increase for agricultural products exported by Argentina (e.g., wheat, oilseed, meat, crops and dairy products) and for the rest of products domestic prices fall. Due to a real depreciation in the exchange rate, we find a larger increase in exports (4.64%

Table 7: Argentina - Liberalization scenarios

	Unilateral reduction				Multilateral Liberalization			
	(a)		(b)		(a)		(b)	
Variable	2020	2030	2020	2030	2020	2030	2020	2030
<b>GDP (vol)</b>	0.19	0.28	0.26	0.41	0.19	0.30	0.40	0.60
<b>Exports (vol )</b>	4.58	4.69	5.97	6.10	4.49	4.64	7.34	7.45
<b>Imports (vol)</b>	2.92	3.20	4.89	5.25	3.32	3.87	6.06	6.74
<b>Terms of trade</b>	-0.94	-0.96	-0.19	-0.21	-0.56	-0.34	-0.38	-0.12
<b>Skilled real wages</b>	0.11	0.22	0.29	0.48	0.00	0.12	0.26	0.51
<b>Unskilled real wages</b>	0.21	0.26	0.35	0.44	0.22	0.27	0.41	0.53
<b>Welfare</b>	-0.11	-0.02	0.04	0.18	-0.08	0.04	0.13	0.33
<b>Welfare decomposition</b>								
<i>Allocation efficiency gains</i>	0.12	0.17	0.12	0.19	0.01	0.03	0.05	0.09
<i>Capital accumulation gains</i>	0.05	0.11	0.10	0.20	0.06	0.12	0.11	0.24
<i>Land supply gains</i>	0.01	0.01	0.01	0.01	0.02	0.03	0.03	0.03
<i>Other gains</i>	-0.10	-0.13	-0.09	-0.13	0.02	0.01	0.01	0.01
<i>Terms of trade gains</i>	-0.16	-0.15	-0.03	-0.03	-0.10	-0.06	-0.05	-0.01
<i>Trade-cost gains (exporter)</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.10
<i>Variety gains</i>	-0.04	-0.03	-0.06	-0.05	-0.08	-0.09	-0.11	-0.11

Notes:

(a) Only Tariffs elimination.

(b) Tariffs and NTBs elimination.

in 2030) than in imports (3.86% in 2030) volumes. Nevertheless, intensifying multilateral trade liberalization through the reduction of NTBs and facilitating trade conditions could become the first-best choice in the medium and in the long run. Argentina's welfare increases even if we have negative consequences on its terms of trade. The main reasons for this are the elimination of the distortion in factors' allocations and the gains linked to the reduction in trade costs as exporter. Consumption prices follow the same trend as under the previous multilateral liberalization scenario and the reduction in NTBs intensifies changes in the same direction and leading to an increase in other agricultural (e.g., vegetables and fruits, fishing) and energy goods (e.g., coal). Real returns for production factors increase particularly for workers.

Any of the protectionism scenarios is preferable to liberalization in the short term. However, in the long run those gains vanish and the elimination of trade barriers (particularly on the multilateral basis) enable for greater welfare gains. As we have seen trade liberalization that only concerns tariffs and that does not include a reduction in NTBs would generate only negligible improvements on welfare. The preferred scenario for Argentina in the long run is the multilateral liberalization that considers a reduction in NTBs.

Table 8: Argentina - Liberalization and Prices

Sector	Unilateral reduction				Multilateral Liberalization			
	(a)		(b)		(a)		(b)	
	2020	2030	2020	2030	2020	2030	2020	2030
<b>Food and Beverages</b>	<b>-1.05</b>	<b>-1.07</b>	<b>-1.39</b>	<b>-1.42</b>	<b>-0.43</b>	<b>-0.34</b>	<b>-0.57</b>	<b>-0.47</b>
<i>Rice</i>	-0.72	-0.72	-0.90	-0.90	-0.38	-0.21	-0.36	-0.15
<i>Wheat</i>	-0.43	-0.39	-0.55	-0.49	1.56	2.09	1.62	2.27
<i>Cereals</i>	-0.60	-0.54	-0.76	-0.68	1.23	1.60	1.27	1.75
<i>Vegetables and Fruits</i>	-0.78	-0.74	-1.26	-1.22	0.70	1.06	0.34	0.78
<i>Oil seeds</i>	-0.50	-0.55	-0.66	-0.71	-0.45	0.23	-0.39	0.43
<i>Sugar</i>	-0.99	-1.01	-1.25	-1.28	-0.37	-0.35	-0.40	-0.34
<i>Crops</i>	-0.68	-0.60	-0.78	-0.67	1.29	1.75	1.39	1.97
<i>Meat Cattle</i>	-0.88	-0.87	-1.10	-1.08	0.49	0.43	0.54	0.51
<i>Other Meat</i>	-0.82	-0.81	-1.03	-1.00	0.33	0.35	0.33	0.39
<i>Milk</i>	-0.73	-0.74	-0.90	-0.91	0.70	0.74	0.75	0.85
<i>Fishing</i>	-1.04	-0.94	-1.27	-1.11	-0.04	0.28	0.10	0.59
<i>Fats</i>	-1.33	-1.61	-1.65	-1.96	-0.24	-0.57	-0.23	-0.58
<i>Dairy products</i>	-1.02	-1.04	-1.33	-1.36	-0.69	-0.63	-0.75	-0.67
<i>Food-Beverages</i>	-1.05	-1.07	-1.39	-1.42	-0.43	-0.34	-0.57	-0.47
<b>Clothing</b>	<b>-2.07</b>	<b>-2.15</b>	<b>-2.67</b>	<b>-2.81</b>	<b>-1.57</b>	<b>-1.23</b>	<b>-1.98</b>	<b>-1.63</b>
<i>Wool</i>	-0.85	-0.70	-1.07	-0.89	1.51	2.20	1.56	2.39
<i>Textile</i>	-2.07	-2.15	-2.67	-2.82	-1.58	-1.24	-1.99	-1.65
<b>House Equipment</b>	<b>-2.08</b>	<b>-2.12</b>	<b>-2.86</b>	<b>-2.89</b>	<b>-1.88</b>	<b>-1.79</b>	<b>-2.58</b>	<b>-2.47</b>
<i>Furnitures</i>	-1.27	-1.28	-1.64	-1.69	-1.09	-0.97	-1.24	-1.16
<i>Chemicals</i>	-1.90	-1.83	-2.70	-2.59	-1.71	-1.50	-2.41	-2.15
<i>Electronic devices</i>	-2.26	-2.49	-2.98	-3.22	-2.10	-2.22	-2.82	-2.96
<i>Machinery</i>	-2.97	-3.23	-3.93	-4.19	-2.71	-2.85	-3.64	-3.76
<b>Others (goods and services)</b>	<b>-1.05</b>	<b>-1.10</b>	<b>-1.34</b>	<b>-1.43</b>	<b>-0.86</b>	<b>-0.81</b>	<b>-0.89</b>	<b>-0.88</b>
<i>Forestry</i>	-0.98	-0.74	-1.29	-0.97	-0.78	-0.32	-0.83	-0.25
<i>Primary</i>	-1.18	-1.19	-1.59	-1.60	-1.04	-0.95	-1.25	-1.12
<i>Metal</i>	-1.86	-1.86	-2.38	-2.36	-1.59	-1.37	-1.91	-1.63
<i>Other Manufactures</i>	-2.00	-2.03	-2.58	-2.62	-1.80	-1.70	-2.22	-2.12
<i>Other Services</i>	-1.02	-1.07	-1.30	-1.40	-0.84	-0.78	-0.85	-0.84
<i>Financial and Business Services</i>	-0.96	-1.02	-1.21	-1.32	-0.78	-0.74	-0.77	-0.76
<b>Transport, Com. and Housing</b>	<b>-1.01</b>	<b>-1.04</b>	<b>-1.33</b>	<b>-1.37</b>	<b>-0.85</b>	<b>-0.76</b>	<b>-0.92</b>	<b>-0.81</b>
<i>Coal</i>	0.00	0.00	0.00	0.00	0.78	0.90	0.79	1.00
<i>Oil</i>	-0.50	-0.49	-0.65	-0.64	-0.48	-0.31	-0.31	-0.08
<i>Gas</i>	-0.80	-0.82	-1.02	-1.04	-0.81	-0.77	-0.79	-0.72
<i>Petrol and Coal products</i>	-0.63	-0.62	-0.86	-0.84	-0.56	-0.41	-0.48	-0.29
<i>Cars and Trucks</i>	-2.55	-2.64	-3.74	-3.81	-2.30	-2.02	-3.57	-3.24
<i>Transport Equipment</i>	-1.27	-1.35	-1.85	-1.92	-1.00	-0.93	-1.45	-1.34
<i>Electricity</i>	-0.80	-0.81	-1.02	-1.03	-0.83	-0.71	-0.82	-0.67
<i>Housing</i>	-1.06	-1.07	-1.33	-1.36	-0.86	-0.77	-0.86	-0.76
<i>Transport</i>	-0.81	-0.85	-1.04	-1.10	-0.64	-0.58	-0.62	-0.56
<i>Communication</i>	-0.95	-1.01	-1.20	-1.30	-0.78	-0.74	-0.76	-0.76
<b>Health and Education</b>	<b>-0.97</b>	<b>-0.95</b>	<b>-1.17</b>	<b>-1.13</b>	<b>-0.80</b>	<b>-0.67</b>	<b>-0.70</b>	<b>-0.51</b>
<b>Leisure</b>	<b>-1.04</b>	<b>-1.06</b>	<b>-1.33</b>	<b>-1.36</b>	<b>-0.86</b>	<b>-0.77</b>	<b>-0.89</b>	<b>-0.78</b>
<i>Paper</i>	-1.48	-1.47	-2.05	-2.02	-1.29	-1.14	-1.67	-1.48
<i>Leisure goods</i>	-1.04	-1.06	-1.33	-1.36	-0.86	-0.77	-0.89	-0.78

Notes:

(a) Only Tariffs elimination.

(b) Tariffs and NTBs elimination.

## 5 Households Welfare Analysis

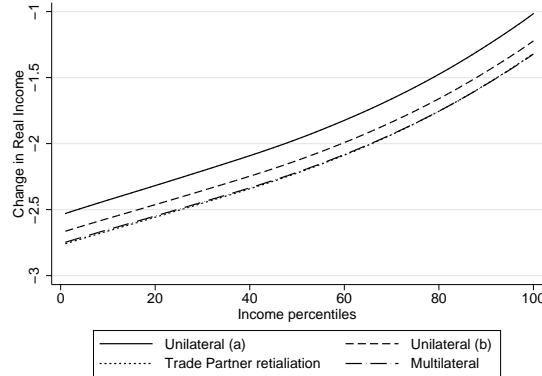
In this section we estimate, the impact on households' welfare in Argentina generated by the alternative trade policy regimes. In the previous section we identified the prices and factor remuneration changes generated by shocks to our trade model. We simulated four scenarios of increased protectionism and we also considered four scenarios of increased trade liberalization.

We use the prices and wage changes from section 4 with the household data described in the subsection 3.3.2 and the methodology we presented in section 3.2 to carry out a comprehensive welfare analysis at the household level. We have both labor market data and households' expenditure data and therefore we can study the overall welfare effect of trade policy and the decomposition between the consumption and labor income effects.

### 5.1 *Protectionism Scenarios*

The figure 1 shows the non-parametric regressions of change in real labor income (as percentage of initial income) and income percentiles for the case of the four protectionist scenarios in Argentina.

Figure 1: Wage Effect of Protectionism Scenarios



This graph shows that the overall effect of this policy is a negative labor income effect between 1% and 2.8%. The effect is stronger for poor households. The result is a combination of a reduction in both unskilled wages (between 2.67% and 2.90%) and skilled wages (between 0.66% and 0.99%). The negative effect is stronger for the case of protectionism followed by retaliation of trade partners and all countries in the world and somehow weaker for the case of unilateral protectionism when



using tariffs only.

Figure 2: Consumption Effect of Protectionism Scenarios

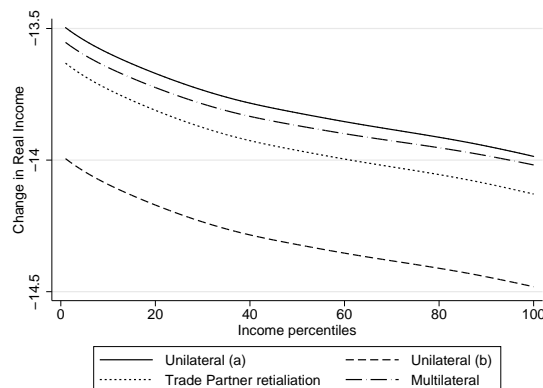
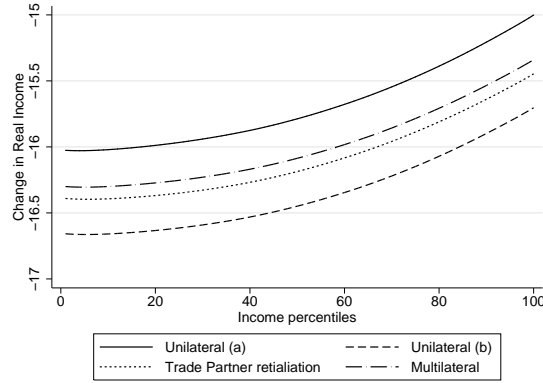


Figure 2 shows the non-parametric regressions of the consumption welfare effect (as percentage of initial income) and income percentiles once again for the case of the four protectionism scenarios in Argentina. In all scenarios, our seven categories of goods would see their price increase affecting negatively households in Argentina. In general the highest price increased are observed on traditionally imported good categories such as clothing and house equipment and the lowest price increased in non-traded goods and services such as health and education or housing or on those traded goods where the country has comparative advantage (notably food). The negative effect ranging between -13.5% and -14.5% is lower for the poorest households as they have a larger share of the expenditures in food, the category that would see the lowest price increased. The worst consumption effect would take place where there is an increased in multilateral protectionism and the most benign situation, though still very negative, would be in the case where Argentina raises only its tariffs to the WTO consolidated level of 35%.

Figure 3 shows the total welfare effect that is the combination of both the labor income and consumption effect. As expected, the overall welfare effect of protectionism in Argentina would be negative in the long run, with a welfare loss between 15% and 16.7% of the initial income depending on the level of livelihood and the scenario under consideration. As before, the worst scenario would be in the case of a multilateral increased in protectionism. Notably, the combination of the wage and consumption effects show that the most disfavoured segment of the population would be the poor in Argentina.

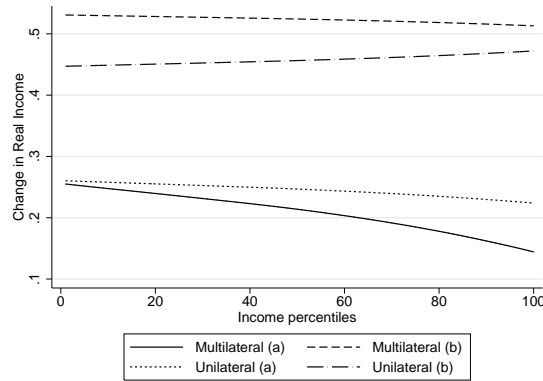
Figure 3: Total Welfare Effect of Protectionism Scenarios



## 5.2 Liberalization Scenarios

We now consider liberalization scenarios in Argentina. We first consider the case of labor income effects.

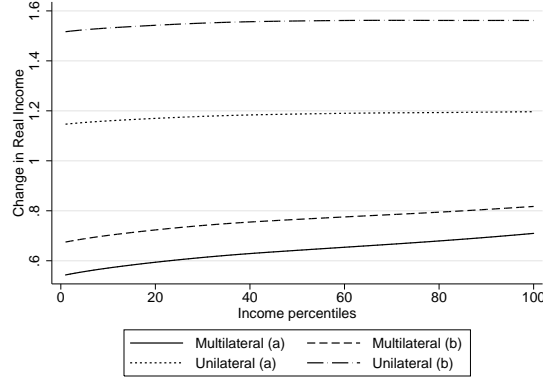
Figure 4: Wage Effect of Liberalization Scenarios



As it can be seen from figure 4, in all four scenarios, liberalization would have a positive labor income effect. This effect would be moderate between 0.1% and 0.5%. The best case scenario would be in the case of multilateral liberalization when both tariffs and NTBs are reduced, followed by the case of unilateral liberalization considering again both tariffs and NTBs. The effect is more or less constant as skilled and unskilled wages tend to change about the same in all scenarios, with three scenarios been slightly pro poor and one scenario been slightly pro rich.

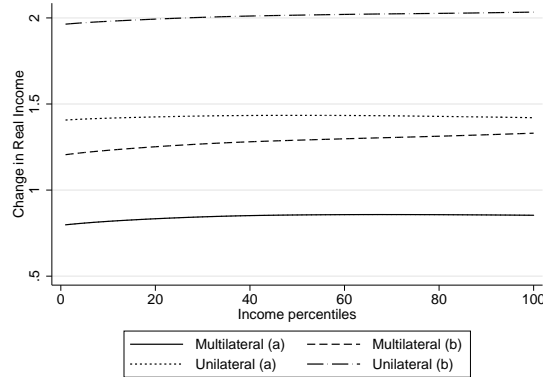
Figure 5 shows the consumption welfare effect for Argentinean households as a consequence of the

Figure 5: Consumption Effect of Liberalization Scenarios



different liberalization scenarios with respect to the baseline. The average price of the different categories of goods would see a reduction, in particular for those goods that are traditionally imported. As the price reduction is lower for the food and beverages category, liberalization would have a slight pro rich consumption welfare effect in Argentina. The consumption welfare effect is modest, with an increase in welfare as percentage of initial income between 0.5% and 1.65%. The scenario where both tariffs and NTBs are cut unilaterally shows the highest positive effect and the multilateral only tariff cuts scenario would generate the lowest positive effect.

Figure 6: Total Welfare Effect of Liberalization Scenarios



Finally, figure 6 shows once again the total welfare effect consisting in taking into account the wage and consumption effects. The overall welfare effect of liberalization in the long run would be positive and range between 0.7% (multilateral tariffs only) and 2% (unilateral tariffs and NTBs) effect. Liberalization has a slightly pro rich effect in Argentina but the difference across the income

distribution is statistically insignificant.

## 6 Final Remarks

Given the recent turn of trade policy of Argentina (and other countries) to a greater degree of protection in the context of international crises accompanied by a proliferation of the introduction of murkier measures, we have been motivated to study the welfare effect of alternative trade policy scenarios in Argentina. We analyze both cases on increased protectionism and liberalization. In the case of protectionism we first examine a unilateral increase of protection both taking into account tariffs only and tariffs plus non-tariff trade barriers and then, two scenarios of multilateral protectionism as retaliation. For the case of liberalization we consider unilateral and multilateral liberalization, again considering both tariffs and NTBs. The impact of the different trade policies is assessed in two different ways. We first use the multi-sectoral and multi-regional computable general equilibrium MIRAGE model to assess the effects of trade policy in outcomes of interest such as GDP, exports, imports, terms of trade, real wages, and welfare. Then, the complementary approach follows the trade and poverty literature and use the price and factor remuneration changes from each simulation to feed them into household survey data and assess the welfare effect on Argentine households.

The main conclusion of the analysis is that in most cases liberalization scenarios dominate scenarios with increasing protectionism. However, the simulations show that in some cases there may be welfare gains from unilateral protectionism in the short run. Scenarios where countries unilaterally increase their tariff levels generate short run welfare effects coming from improvements in the terms of trade. These gains disappear in the long run when allocation efficiency losses dominate and as a result, the country is worse off. We were also interested in assessing the effects of further liberalization. Increased openness would improve welfare in all cases but only in the long run. Unilateral tariffs cuts would lead to a reduction of welfare in the short run due to deterioration in the terms of trade faced by the country and this results holds even in the long run. On the hand, unilateral and multilateral liberalization scenarios, where tariffs cuts are accompanied with reduction in NTBs and reductions in facilitations costs, are welfare improving in the long run.

In our analysis for Argentina we also combine the price and wage changes from each scenario with

household survey data to assess the welfare impact at the household level. We have data on both wages and budget shared for different goods and therefore we can estimate the overall welfare effect (consumption and labor income effects). The analysis shows that protectionism has negative effect across the entire income distribution and the effect is particularly severe for the poorest households. Liberalization scenarios improve households' welfare with a small pro rich bias.

Our results are indicative of the possible welfare effects of both protectionism and liberalization in Argentina showing that short run gains from protectionism could lead to sub optima equilibria when countries retaliate or when long run adjustments take place. These findings are subject to important caveats related to the circumstances of Argentina and the limitations of our CGE model. The first limitation in the analysis is that we have a stylized version of the world economy and some important elements, especially those related to the political economy of trade policy, are missing in the analysis. Also, the model does not allow for changes in factors' endowments (neither migration nor foreign direct investment are allowed) and assumes production factors to be fully employed. A second limitation in our analysis is that we are not incorporating estimates of second order effects in the household welfare analysis, despite the fact that the CGE provides these estimates. A third limitation of the analysis is that the price and wage simulations are used across all type of households and sector of employment. For instance, a richer model should incorporate wages that are sector and skill specific to better explain the effect of trade policies on labor income.

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