ECONOMIC IMPACT OF AGRICULTURE TRADE LIBERALIZATION IN ARGENTINA

By

César Carlos Campos Matos

THESIS

Submitted to
KDI School of Public Policy and Management
in partial fulfillment of the requirements
for the degree of

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ABSTRACT

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Since the Uruguay Round multiple efforts have been made to set the first pillars of world order, international fair competition and less distortion in the world market. Further negotiations were needed to accomplish the Agricultural Agreement and in 2001, the WTO Ministerial Conference of Doha established long-term objectives for a market-oriented trading system. Therefore, country members of the WTO had the chance to negotiate a set of "modalities" or targets in order to achieve the Doha objectives. This is the scenario in which Argentina, a world major food-producer and food-exporter Latin American country, has to negotiate in the WTO better market conditions to export its agricultural commodities. This is the core reason that explains why this research has been made. Its purpose is to evaluate the economic impact of a proposal to the WTO concerning the agricultural sector of Argentina. The evaluation of the impacts in prices, production, international trade and welfare were analyzed with the help of a world-recognized modeling tool, the Agricultural Trade Policy Simulation Model (ATPSM), designed by the Trade Analysis Branch of the United Nations Conference on Trade and Development (UNCTAD).

Three scenarios were established with the help of the ATPSM model, ranging from the most conservative (Scenario 1) to the most liberal (Scenario 3) in terms of total free trade, both for developed countries as well as for developing countries. As a result, there is some evidence that considers Scenario 1 as the most suitable for Argentina because it gives the highest welfare for this country, in comparison with the other scenarios. However, it is difficult to reach a definitive decision because there are some other major and sensitive issues that have to be studied more profoundly.

Another finding of the research is that countries like Argentina tend to specialize in specific products in which they have comparative advantages, thanks to a relative major resource, land for this particular country. The proposal of the modalities seems to be a win-win negotiation type, where all the participants generally get positive results. In the global level, the reduction of domestic support, tariffs and subsidies will generate an increase in the global welfare, with the exception of some economies (United States and the European Union, for example) in the total free trade scenario. Besides, the trade liberalization scenario will have in general a positive effect for the developing countries, resulting in better terms of trade. The reduction and/or elimination of trade distortions to the agriculture will tend to improve the global distribution of income.

This research attempts to contribute with the policy-making decisions concerning the agriculture of Argentina, in view of the modalities or targets that this country has to present to the WTO.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I: INTRODUCTION

The participation of the Republic of Argentina in the international commerce has increased constantly for the last decade, especially for the agriculture products thanks to the presence of regional markets such as MERCOSUR (Southern Cone Common Market) as well as the commercial agreements with other countries or commercial blocs.

The task to find new markets for Argentina's products is a never-ending challenge in the actual world commerce. In this point of view, the World Trade Organization summits are an important opportunity for the negotiation of more open market scenarios. This is the context in which Argentina is designing a proposal for this organization, and in order to have a solid support it is necessary to show the economic impacts of agriculture trade liberalization in Argentina and some other economies. Consequently, the agriculture sector has been selected for this study because Argentina has a long time tradition as a major Latin American agricultural producer.

This research studies the major economic impacts of trade liberalization on the agriculture sector of Argentina due to a proposal to the World Trade Organization and emphasizes its results on prices, production, international commerce and welfare using a worldwide recognized trade policy simulation tool called ATPSM (Agricultural Trade Policy Simulation Model), designed by the Trade Analysis Branch of the UNCTAD (United Nations Conference on Trade and Development).

This study attempts to be the first step for future and more detailed investigations on this subject.

CHAPTER II: THE COUNTRY

The Republic of Argentina is the second largest country in South America. It has a territory of 3'761,274 square km and a population of around 38.6 million inhabitants. Argentina is bordered by Bolivia and Paraguay on the North. Brazil, Uruguay and the Atlantic Ocean on the East and Chile on the West. Around 80% of the population lives in urban areas and 20% in rural areas. Argentina's weather ranges from subtropical in the Northeast, to temperate in the central region, to arid and semiarid and cold in the South and along the mountains. Argentina's government system is representative, republican and federal, divided into Executive, Legislative and Judicial branches, both at national and provincial level. Twenty-three provinces form the Nation, and the Autonomous City of Buenos Aires is Argentina's capital city. Spanish is Argentina's official language.

Argentina's wealth has traditionally come from ranching and grain growing, and agricultural commodities continue to be a mainstay of Argentine exports. A bright spot for the economy in 2006 was the agricultural sector. In the first part of this decade many agricultural producers saw commodity prices fall while the cost of their inputs rose. They also contended with scarce credit and high export taxes, but in the following years this situation improved dramatically. In August 1997 Argentina also for the first time in 67 years of economic history exported a shipment of beef to the United States. The government hopes to export more than three million tons of beef a

year by 2008, and beef producers are looking at this as an important conduit to the lucrative markets of Asia and Japan.

Agriculture is one of the bases of Argentina's economy. Since the second half of the 19th century, the country followed an agricultural and livestock export model of development with a large concentration of crops in the fertile region called Pampas, located mainly in the southern Mesopotamia (the littoral of the rivers Parana-Plata and Uruguay) and the center and north of the province of Buenos Aires. This almost exclusive primary development was mitigated only after World War I and especially after the 1930s, by the introduction of manufacturing industries to achieve import substitution. In 2006, more than one third of the Argentine exports were composed of primary agricultural products, mainly soybean.

Argentina's soybean crushing capacity more than doubled during 2005 - 2006 years helping solidify Argentina as the number one exporter of soybean meal and soybean oil in the world. Argentina produces 18% of the world's soybean but accounts for 46% of the world's soybean meal exports and 55% of the world's soybean oil exports.

The factors behind Argentina's strength in exporting soy products include small internal consumption of soy products, new efficient soy processing facilities, and a competitive currency exchange rate, but the primary driver in the continued expansion of Argentina's soy exports is the Differential Export Tax (DET) that financially favors the exports of processed soy products over whole soybeans.

Agriculture and agro-industry in Argentina focus on the production of cereal, oil grains and seeds, sugar, fruit, wine, tea, tobacco, and cotton. Argentina is one of the major food-producing and food-exporting countries of the world, with estimated

27’200,000 hectares of arable and permanent cropland. One of the most important factors in the Argentine development of its agriculture is the advanced degree of mechanization; in 2006 an estimated of 280,000 tractors and 50,000 harvester-threshers were in use.

Argentina is the number one exporter of soybean meal, soybean oil, sunflower oil, honey, pear and lemon in the world. It is the number two exporter of maize and sorghum in the world. It is the number three exporter of soybean in the world and finally, Argentina is the number five exporter of wheat and beef in the world. [1]

[1] **Instituto Nacional de Tecnología Agropecuaria**. *Argentina’s Production and Exports*. Online, INTA, Internet, 22 April. 2007.

CHAPTER III: THE MODEL

Progress in the current WTO round of multilateral trade negotiations requires that the interests of developing countries be adequately taken into account, as acknowledged in the Doha Development Agenda. The complexity of international negotiations implies that for developing countries to participate effectively, their capacity to do so must be enhanced. One contribution towards enhancing the capacity to effective negotiation is the provision of detailed tools of analysis that show the impact of liberalization on individual countries for their products.

Helping developing countries to evaluate and develop a negotiating position requires a detailed coverage of agricultural products, a high degree of country disaggregation and information on quota rents in addition to high quality data on tariffs, export subsidies and domestic support policies. As negotiations may focus on reforms to each of these three areas, it is useful to know the impact of different types of reforms on different sectors and countries. Finally, the distributional effects of trade liberalization far outweigh the welfare effects. While models typically ignore the costs of moving resources from one sector to another, it is useful to know the likely transfers between producers, consumers and taxpayers. The Agricultural Trade Policy Simulation Model (ATPSM) is used to assist developing countries in framing a negotiating strategy.

ATPSM is a deterministic, comparative static, partial equilibrium model. This means that there are no stochastic shocks or other uncertainties, and there is no specific time

dimension to the implementation of the policy measures or to the maturing of their economic effects. The comparative static nature of the model does not imply that the policies take effect instantaneously. Rather, there is a comparison between two states at a similar point in time, one with the policy change, the other without. Finally, whereas the model aims at estimating far-reaching details of the agricultural economy, it does not deal with the repercussions of trade barrier reductions on other parts of the national economy. Thus, neither effects on the government budget (except for tariff revenues and subsidies to exports and domestic production) nor on the industrial and service sectors of the economy or the labor market are the subjects to analysis. Simplifying the model in these respects allows for detailed specifications of policies in a large number of countries for numerous commodities.

The ATPSM was designed by the Trade Analysis Branch of the UNCTAD (United Nations Conference on Trade and Development). Its use is worldwide recognized as a policy simulation tool on agriculture. It analyses the effects of trade policy changes on supply and demand using a system of simultaneous equations that are characterized by a number of data and behavioral relationships designed to simulate the real world. The model solution gives estimates of the changes in trade volumes, prices and welfare indicators. It covers 175 countries and 36 agricultural commodities. The economy for each country is represented individually, except for the European Union, which is represented as one region with a common agricultural policy for all the comprising countries. Therefore, the model can be characterized as a truly global model.

There are 36 commodities in the ATPSM data set. This includes many tropical commodities of interest to developing countries, although many of these have relatively little trade by comparison with some of the temperate product. The 36 commodities are categorized into groups to facilitate the presentation of results, as it is shown in Table 1.

Table 1: Commodities in the ATPSM

Meat	**Tobacco and cotton**	**Fruits**	**Beverages**
• Bovine meat • Sheep meat • Pig meat • Poultry	• Tobacco leaves • Cigars • Cigarettes • Other tobacco • Cotton linters	• Apples & pears • Citrus fruits • Bananas • Other fruits	• Coffee green bags • Coffee roasted • Coffee extracts • Cocoa beans • Cocoa butter • Cocoa powder • Chocolate • Tea
Dairy products	**Cereals**	**Vegetables**	**Oils**
• Milk, fresh • Milk, conc. • Butter • Cheese	• Wheat • Maize • Sorghum • Barley • Rice	• Pulses • Roots, tubers • Tomatoes	• Oil seeds (include soybean) • Vegetable oils (include soybean oil)
			Sugar • Sugar

Own elaboration.

The world economies are classified in two different groups, the policy economies and the non-policy economies. The first ones are called this way because the economic impacts can be simulated using this model. These economies are the European Union, Australia, Canada, Japan, United States, New Zealand, Norway, Switzerland, Argentina, Barbados, Brazil, Brunei, Bulgaria, Chile, China, Colombia, Cyprus, Czech Republic, Ecuador, Egypt, El Salvador, Guatemala, Hungary, Iceland, India, Indonesia, Israel, South Korea, Malaya, Mexico, Morocco, Namibia, Nicaragua, Pakistan, Panama, Philippines, Poland, Rumania, Slovakia, South Africa, Swaziland, Thailand, Tunisia, Turkey, Uruguay and Venezuela. The non-policy economies are named in this way because no simulation of economic impacts on agriculture can be made. This is due to the lack of precise information about the agricultural commercial policies of these economies.

The ATPSM can be used as a tool by researchers and negotiators alike for quantifying the economic effects of potential changes resulting from future unilateral action by individual countries or actions required under negotiated agreements. In an increasingly integrated world, with complex links between countries and sectors, the systematic framework of ATPSM empowers policy makers and trade negotiators. The latest version of ATPSM 3.1 has a graphical user interface to assist the user in setting up scenarios, running the simulations, storing and reading the output data. The model takes into account three different types of economic agents: the consumers, the producers and the government.

The ATPSM focuses on standard agricultural trade policies, such as tariff cuts, subsidy reductions and quota changes. However, a number of other agricultural trade interventions exist, such as sanitary and phytosanitary regulations, seasonal import

restrictions and anti-dumping measures. Such interventions cannot be simulated unless a tariff equivalent can be derived. Another set of non-quantifiable policies is found in the farm price support over and above the market access measures. These range from subsidies on agricultural inputs to research and development financing, favorable interest rates and amortization periods on loans, etc. The primary problem in modeling such policies is that the support they provide is general and not specifically assigned to certain commodities. These policies support agricultural production capacity as a whole. Although one could envisage simulating such support in a model, it is not currently possible in the ATPSM.

Several sources such as the International Financial Statistics, FAO Trade Yearbook and UNCTAD price statistics have been used to establish the world market prices used by ATPSM, for a period extending from 1999 to 2001. The volumes of trade and production have been obtained from the FAO supply utilization accounts. Consumption is obtained by adding imports and production and subtracting exports – the so-called apparent consumption. This concept does not take into account movements in and out of stocks. Sometimes, owing to incompatibility between production and trade accounts, the apparent consumption can equate to a negative number. In such a case production is increased to ensure that consumption is non-negative.

As the commodity specification in the supply utilization accounts is more detailed than the one used in the ATPSM, the volumes were aggregated applying appropriate conversion factors. To stabilize the data for annual variations in yield, a three-year average of volumes from 1999 to 2001 was estimated.

All import trade barriers (out-of-quota and within-quota tariff rates and tariff rate quotas) are derived using information from the Agricultural Market Access Database (AMAD) which is publicly accessible from the website www.amad.org, it is maintained by the Organization for Economic Co-operation and Development (OECD), and a number of other organizations, including FAO, UNCTAD, the US Department of Agriculture, Agriculture Canada and the European Union Agricultural Directorate, contribute to its development. Most of the data in AMAD come from WTO schedules and notifications. However, the tariff rates used in the model are obtained from the UNCTAD database. In ATPSM all tariffs are expressed as a percentage of the world market price.

More detailed information concerning the ATPSM is given in Appendix A, which shows some relevant extracts of the manual of this trade policy simulation tool on agriculture.

CHAPTER IV: THE PROPOSAL

4.1 The background

The original GATT (General Agreement on Tariffs and Trade) did apply to agricultural trade, but it contained loopholes. For example, it allowed countries to use some non-tariff measures such as import quotas, and to subsidize. Agricultural trade became highly distorted, especially with the use of export subsidies, which would not normally have been allowed for industrial products. The Uruguay Round produced the first multilateral agreement dedicated to the sector. It was a significant first step towards order, trade liberalization and a less distorted sector. It was implemented over a six-year period that began in 1995. The Uruguay Round agreement included a commitment to continue the reform through new negotiations. These were launched in 2000, as required by the Agriculture Agreement.

The WTO Agriculture Agreement was negotiated in the 1986 – 1994 Uruguay Rounds and it is a significant first step towards trade liberalization. It includes specific commitments by WTO member governments to improve market access and reduce trade-distorting subsidies in agriculture. Participants have agreed to initiate negotiations for continuing the reform process one year before the end of the implementation period by the end of 1999. These talks have now been incorporated into the broader negotiating agenda set at the 2001 Ministerial Conference in Doha, Qatar.

The objective of the Agriculture Agreement is to reform trade in the sector and to make policies more market-oriented. This would improve predictability and security for importing and exporting countries alike. The agreement does allow governments to support their rural economies, but preferably through policies that cause less distortion to trade. It also allows some flexibility in the way commitments are implemented. Developing countries do not have to cut their subsidies or lower their tariffs as much as developed countries, and they are given extra time to complete their obligations. Least-developed countries do not have to do this at all. Special provisions deal with the interests of countries that rely on imports for their food supplies, and the concerns of least-developed economies.

In November 2001, the fourth WTO Ministerial Conference was held in Doha, Qatar. The declaration issued on 14 November launched new negotiations on a range of subjects, and included the negotiations already underway in agriculture and services. The declaration builds on the work already undertaken in the agriculture negotiations, confirms and elaborates the objectives, and sets a timetable. Agriculture is now part of the single undertaking in which most of the linked negotiations are to end by 1 January 2005.

The declaration reconfirms the long-term objective already agreed in Article 20, to establish a market-oriented trading system through a program of fundamental reform. The program encompasses strengthened rules, and specific commitments on government support and protection for agriculture. The purpose is to correct and prevent restrictions and distortions in world agricultural markets.

Without prejudging the outcome, member governments commit themselves to comprehensive negotiations aimed at three objectives: substantial improvement in market access, the reduction of export subsidies and the significant reduction for domestic supports that distort trade. The declaration makes special and differential treatment for developing countries throughout the negotiations. It says the outcome should be effective in practice and should enable developing countries to meet their needs, in particular in food security and rural development. The ministers also take note of the non-trade concerns (such as environmental protection, food security, rural development, etc.) reflected in the negotiating proposals already submitted. They confirm that the negotiations will take these into account, as provided for in the Agriculture Agreement.

One of the most critical stages of the agriculture negotiations is the establishment of a set of "modalities" or targets, including numerical targets, for achieving the objectives set out in the Doha Ministerial Declaration: "substantial improvements in market access; reductions of, with a view to phasing out, all forms of export subsidies; and substantial reductions in trade-distorting domestic support". It will also include some rule making. This stage will therefore determine the shape of the negotiations' final outcome.

The "modalities" will be used for country members to produce their first offers or "comprehensive draft commitments". The Doha Ministerial Declaration said this had to be done by the Fifth Ministerial Conference in Cancun, Mexico, 10-14 September 2003, a few months after the 31 March 2003 deadline for modalities. As it turned out, country members failed to meet the March 2003 deadline for agreeing "modalities" and then turned their attention to an outline or "framework" of the modalities, which

was eventually agreed on 1 August 2004. The periods involved can therefore be described as "preparations for modalities" (March 2002-July 2003), "Cancun and the framework phase" (August 2003-August 2004) and "the modalities phase" (September 2004-Up to the present). The original mandate has now been refined by work at Cancun in 2003, Geneva in 2004 and Hong Kong in 2005. During the discussions, new members and transition economies repeatedly argue for special and differential treatment for countries in their position, because of the state of their economies and because the new members are still implementing market-access commitments under their membership agreements. Again, some important players have not proposed specific numbers, and this has led to criticism from others.

4.2 The proposal for Argentine agriculture

This is the context, described in the previous paragraphs, in which Argentina has to propose its "modalities" or targets to the WTO, regarding the agriculture sector. Due to the restrictions of the ATPSM (Agricultural Trade Policy Simulation Model) it was necessary to simplify the negotiating alternatives to the WTO into three different scenarios; all of them will be compared using the same baseline. The initial data for exports, tariffs and quotas corresponds to the average of the years 1995 and 1998, and were taken from the AMAD database. This specific range of years was chosen because they represent a period of stability in the actual international trade history of Argentina.

In the present research, two scenarios will be referred to the modalities and the third one will suppose a complete trade liberalization of the policy countries. In brief, the first scenario is considered as "less liberated" or "conservative", the second scenario is "more liberated" or "ambitious" and finally, the third scenario is the "total

liberalization" of trade. This last scenario will be used as a guideline and reference for the other two. The purpose of this mechanism is to analyze how close is the proposal for Argentina to a total opened world economy, which can be considered as the optimal situation. Therefore, in this especial case of total liberalization (scenario 3) there are no tariffs nor quota volume, nor domestic support and nor export subsidies. This explains why there is a -100% decrease for the parameters in scenario 3.

In the Doha Ministerial Declaration, members committed to negotiations aimed at producing "substantial improvements in market access for all products." WTO members have agreed that tariff reductions will be made through a tiered tariff-cutting formula that takes into account their different tariff structures. Each country's tariffs will be structured into four tiers based on the height of each tariff, with each tier subject to a different percentage reduction. The overall objective of the tiered formula is to achieve a degree of harmonization of tariff structures across countries and products. This will be achieved through progressively deeper cuts on those tiers containing higher tariffs, with flexibilities for members to designate a limited number of sensitive products, which will be subject to lower reduction commitments.

In the case for developing countries there is an agreement that their tariffs will be subject to lesser cuts than the case for developed countries, and they will be given more time to implement these cuts.

In Table 2 there is a summary of the bands of tariffs for developed and developing countries, thresholds and the respective in-quota tariff cuts [2].

[2] **Vanzetti, David**. *Assessing the agricultural negotiations with the ATPSM*, online, UNCTAD, Internet, 11 Apr. 2007.

Table 2: In-quota tariff cuts

DEVELOPED COUNTRIES		
Band	Threshold %	In-quota tariff cut %
1	0 - 30	35
2	30 - 60	45
3	60 - 90	50
4	> 90	60
DEVELOPING COUNTRIES		
Band	Threshold %	In-quota tariff cut %
1	0 – 30	25
2	30 – 80	30
3	80 – 130	35
4	> 130	40

Own elaboration.

As it can be noted, both developed and developing countries belong to Band 3, therefore, according to the presented table, the in-quota tariff cut for developed countries is 50% and in the case for developing countries is 35%. In the research, the in-quota tariff cut of 50% is used for scenario 1 and 2, for developed countries. The researcher considered an in-quota tariff cut of 33% for the two scenarios in the case of developing countries, because this percentage has more proportionality to the actual threshold of this specific group of countries.

A tariff-rate quota (TRQ) is a quota for a volume of imports at a lower tariff. After the quota is reached, a higher tariff is applied on additional imports. Suppose a country replaces its quota of 10,000 tons with a TRQ of 10,000 tons. The TRQ appears to differ little from the earlier "absolute" quota. The distinction is that under an absolute quota it is legally impossible to import more than 10,000 tons, whereas under a TRQ, imports can exceed 10,000 tons but a higher, over-quota tariff is applied on the excess. In theory, imports within the quota are charged the lower tariff; over-quota imports are charged the higher tariff. In order to achieve TRQ liberalization, there are three ways: Reducing the out-quota tariff, increasing the quota volume or a mixture of both.

In the research, coefficients for the Swiss formula are proposed in the out-quota tariff column of Table 3. For developed countries, this coefficient decrease from 35 (“conservative” scenario 1) to 25 (“ambitious” scenario 2). These specific coefficients were taken from the proposals made by the United States and the European Union [3]. For developing countries, the coefficient decrease from 50 (“conservative” scenario 1) to 33 (“ambitious” scenario 2). These specific numbers were taken from a paper about

[3] **Vanzetti, David, and Ralf Peters**. *An analysis of the proposals by the WTO, the United States and the European Union on agricultural reform*, online, UNCTAD, Internet, 14 Apr. 2007.

the agriculture trade liberalization for developing countries [4]. The Swiss formula implies the higher the tariff, the deeper the tariff cut, for example, a 100% tariff is cut by 50%, but a 150% tariff is cut by 60%. The Swiss formula for tariff cuts with the parameter value of 25 is defined as follows: $T_f = (25*T_0)/(25+T_0)$ where T_f and T_0 are final and initial tariffs, and 25 is the parameter assumed or proposed coefficient.

The same references used for the Swiss coefficient were the starting point for the proposal of the quota volume increase. David Vanzetti as well as other researchers established an increase of the quota volume in a range from 20% to 60%, therefore, in the present research an average of 40% is used as the percentage increase of the quota volume for all the scenarios and for all the cases: developed and developing countries.

Domestic support policies were recognized as one source of market and trade distortions in negotiating the Uruguay Round Agreement on Agriculture (AoA). Countries, therefore, agreed to limit domestic policies presumed to be the most trade distorting but to exempt other policies from any limitations. A key issue in the next round of trade talks is the identification of further limits or exemptions for domestic support policies. A critical question is whether, and to what extent, policies exempt from limitations actually alter production and trade. The continuing challenge for WTO negotiations is obtaining effective commitments about domestic support policies to reduce world market distortions in agricultural trade while allowing countries the flexibility they need to achieve their unique national priorities.

[4] **Vanzetti, David, and R. Sharma**. *Impact of agricultural trade liberalization on developing countries: results of the ATPSM partial equilibrium model*, online, Agricultural Trade Research Consortium, Internet, 17 Apr. 2007.

Domestic support policies and trade policies are interrelated, a change in one of them has implications for accomplishing the goals of the other. Trade policies, by directly influencing imports and exports, facilitate domestic price and income goals; domestic price, income, and production policies by changing production and prices affect a country's ability to compete in world markets.

Limits of any kind on domestic agricultural policies are unprecedented in a trade agreement. However, because of the interrelationships among policies, limits on domestic policies were thought to be essential to the success of the primary WTO goals of increased market orientation and reduced protection in world trade. Under the Uruguay Round Agreement on Agriculture (AoA), support levels from domestic policies presumed to be the most trade distorting are subject to upper limits that decline over time.

Negotiators of the Agreement on Agriculture recognized the need for individual countries to use domestic policies to address certain issues, especially those related to equity (e.g., aid to the needy), market failure (e.g., environmental programs) and the absence of risk markets (e.g., income safety net programs).

As a result, expenditures on selected policies were exempted from reduction commitments, as long as these policies were considered to be no more than "minimally distorting" of production and trade.

A traffic light analogy is used to categorize types of domestic support policies. WTO strategies for limiting support were tailored to the different categories or "boxes":

-Red box policies must be stopped or eliminated.

-Amber box policies are subject to limitations.

-Green box policies are exempted from any limitations.

-Blue box policies, were created especially for payment programs that limit production and meet specified criteria.

Countries committed to reduce domestic support agreed to decrease their Aggregate Measure of Support (AMS) below the level that existed during the 1986-1988 base period, which was of relatively high support resulting from depressed market prices. Small levels of support concerning the amber box policies were permitted in a range from 5% to 15%, therefore, in the research an average of 10% of domestic support was used, that means a percentage cut of 90% in domestic support was considered in the research, for all the scenarios and for all the cases: developed and developing countries.

In the research, the objective is to eliminate the export subsidies, a major trade distorting parameter, therefore, for all the scenarios and cases (developed and developing countries) there is an export subsidy cut of -100%. The summary of all the information mentioned before is shown in Table 3.

Table 3: Modeling scheme of the three scenarios

DEVELOPED COUNTRIES					
	In-quota Tariffs (% cut)	**Out-quota tariffs**	**Quota volume (%)**	**Domestic support (% cut)**	**Export subsidies (% cut)**
Scenario 1 *"Conservative"*	-50%	Suisse formula coefficient=35	40%	-90%	-100%
Scenario 2 *"Ambitious"*	-50%	Suisse formula coefficient=25	40%	-90%	-100%
Scenario 3 *"Complete Liberalization"*	-100%	-100%	Elimination	-100%	-100%
DEVELOPING COUNTRIES					
	In-quota Tariffs (% cut)	**Out-quota tariffs**	**Quota volume (%)**	**Domestic support (% cut)**	**Export subsidies (% cut)**
Scenario 1 *"Conservative"*	-33%	Suisse formula coefficient=50	40%	-90%	-100%
Scenario 2 *"Ambitious"*	-33%	Suisse formula coefficient=33	40%	-90%	-100%
Scenario 3 *"Complete Liberalization"*	-100%	-100%	Elimination	-100%	-100%

Own elaboration.

The information presented in Table 3 is the input data to the ATPSM, these parameters are the starting point for all the modeling results for each of one of the scenarios presented. The ATPSM considers as developed economies the United States, the European Union, Australia, Canada, Brunei, Hong Kong, Iceland, Israel, Japan, Kuwait, New Zealand, Norway, Slovenia, Switzerland, Taiwan and the United Arab Emirates. The ATPSM considers as developing economies Albania, Algeria, Argentina, Armenia, Azerbaijan, Belarus, Bolivia, Bosnia and Herzegovina, Brazil, Bulgaria, Chile, China, Colombia, Costa Rica, Croatia, Cuba, Czech Republic, Ecuador, Egypt, Georgia, Guatemala, Honduras, Hungary, India, Indonesia, Iran, Iraq, Jamaica, Jordan, Kenya, North Korea, South Korea, Lebanon, Libya, Lithuania, Malaya, Mexico, Mongolia, Morocco, Nicaragua, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Rumania, Russian Federation, Saudi Arabia, South Africa, Sri Lanka, Syria, Thailand, Tunisia, Turkey, Ukraine, Uruguay, Venezuela, Vietnam and Yugoslavia. The economies not mentioned above are considered as the least developed countries by the ATPSM, therefore this special group does not receive any influence from neither the proposal nor the modeling results.

In Table 4 can be seen the initial and final out-quota tariffs for each of the scenarios presented in the research. The tariffs for the third scenario of total liberalization are not presented because they will be equal to zero. This research will focus, as it has been stated before, on the agriculture of Argentina and in order to compare the results between developing and developed economies, a special interest will be put on the results for the United States and the European Union. In Table 4, the baseline represents the initial out-quota tariffs, while the results presented in scenario 1 and 2, for each of the selected agricultural products, are the final out-quota tariffs, according to the input data of the modeling scheme of the scenarios (Table 3).

Table 4: Initial and final out-quota tariffs for selected products and economies

	Argentina	United States	European Union
Wheat			
Baseline	5.80%	2.60%	52.00%
Scenario 1	5.20%	2.42%	20.92%
Scenario 2	4.93%	2.36%	16.88%
Scenario 3	0.00%	0.00%	0.00%
Maize			
Baseline	6.80%	0.60%	26.90%
Scenario 1	5.99%	0.59%	15.21%
Scenario 2	5.64%	0.59%	12.96%
Scenario 3	0.00%	0.00%	0.00%
Oilseeds			
Baseline	5.10%	17.00%	0.00%
Scenario 1	4.63%	11.44%	0.00%
Scenario 2	4.42%	10.12%	0.00%
Scenario 3	0.00%	0.00%	0.00%
Vegetable oils			
Baseline	11.70%	3.40%	8.80%
Scenario 1	9.48%	3.10%	7.03%
Scenario 2	8.64%	2.99%	6.51%
Scenario 3	0.00%	0.00%	0.00%
Barley			
Baseline	8.60%	0.80%	52.50%
Scenario 1	7.34%	0.78%	21.00%
Scenario 2	6.82%	0.78%	16.94%
Scenario 3	0.00%	0.00%	0.00%

Own elaboration.

CHAPTER V: RESULTS AND CONCLUSIONS

5.1 Prices

In the ATPSM model, domestic prices are determined as a function of world market prices and of the support measures, tariffs, subsidies and quotas. There is no independent behavior of domestic prices. In addition, no account is taken of domestic trade margins. Domestic prices have the character of border wholesale prices. An exception is the farm price, also called supply price or producer price, which might be affected by extra farm price support (for example, deficiency payments) over and above the market access support.

It is important to notice in the model that when a commodity is exclusively imported, the wholesale and farm price are equal to the world market price plus the import tariff. Similarly, if the commodity is exclusively exported, the domestic wholesale and farm price are equal to the world market price plus the tariff equivalent of the export subsidy.

In this section, the evolution of selected international commodities prices will be shown as well as the impact on consumer and producer prices for selected agricultural commodities in Argentina.

Table 5 shows the impact on the international price for selected agricultural commodities for each scenario analyzed. In the case of maize and barley, the effects of the international price in the three scenarios are as a rule lower than the effects on

the other selected agricultural commodities. In general, this special case can be explained due to the presence of less distorted markets for these commodities, for example, the less distorted market oriented trade policies of the European Union concerning these specific agricultural commodities. Consequently, in the case for wheat, oilseeds and vegetable oils, there are some market distortions for these three selected commodities, especially for the first one, which has the highest variation in the three scenarios.

A peculiar situation is observed in Table 5, although each scenario implies a progressive elimination of trade barriers, the international price instead of decreasing is increasing. The explanation of this behavior is as follows. First, consumers' answers (demand) to price variations are immediate, while the response of the supply takes more time and usually is in the long term. Second, principally two other parameters should be taken into account, the final out-quota tariff and the quota volume. Suppose the international price for a commodity decreases thanks to certain elimination or reduction of trade barriers, such as domestic support policies, in-quota tariffs or export subsidies, for example. Consumers in view of the reduction of the international price of the commodity will tend to buy more of this commodity: the higher price reduction, the higher increase in the demand, as long as total satisfaction is not reached. Therefore, although the quota volume can be increased, the quantity demanded for the commodity surpasses the quota volume limit, consequently, all the additional imports over the quota are subjected to a higher out-quota tariffs, which as a rule, are higher than the in-quota tariffs (although both of them can be gradually reduced). The net result, taking into account all the changes, is the increase of the international price for all the scenarios, because of the higher out-quota tariffs and the

insufficient capacity of the quota volumes. This explanation is confirmed in Table 7, where as a rule, all the selected commodities suffer an increase in their prices, for all the scenarios; the more liberated scenario, the higher increase in the consumer prices.

Table 5: Evolution of the international price for selected products

	Baseline	Escenario 1		Escenario 2		Liberalization	
Product	**US$/ton**	**US$/ton**	**% change in prices relative to the base run**	**US$/ton**	**% change in prices relative to the base run**	**US$/ton**	**% change in prices relative to the base run**
Wheat	168.75	191.35	13.39%	192.08	13.83%	195.70	15.97%
Maize	146.60	150.51	2.67%	151.11	3.08%	154.52	5.40%
Oilseeds	287.75	310.72	7.98%	313.58	8.98%	323.83	12.54%
Vegetable oils	677.27	714.59	5.51%	721.50	6.53%	766.47	13.17%
Barley	144.90	147.06	1.49%	147.19	1.58%	148.14	2.24%

Own elaboration.

In the case of the actual international market price of wheat some considerations about the latest version of the ATPSM 3.1 (January 2006) must be made. First, price data in the ATPSM has been updated to the year 2001 and secondly, applied tariff data has been updated to the year 2000 or 2001, according to the model manual. This means that the actual international price variations of the selected agricultural commodities cannot be expressed in the model. This is the case of the current international price of wheat, which due to a mixture of droughts, floods and low stocks in the major wheat exporter countries of the world, the price of wheat is rising to record levels on global commodity markets. According to the International Grain Council, wheat stocks are at their lowest level for the last 25 years and the exports

from the biggest five wheat producers of the world (European Union, United States, Australia, Canada and Argentina) have halved in the last three years. On the other hand, grains are in higher demand for the production of biofuels as governments impose stiff biofuel targets on road fuels, adding more pressure to the wheat markets. The sudden price surge is good news for farmers and will stimulate more planting and bigger harvests in the future but it will also add some inflationary worries among consumers and governments.

Table 6 shows the impacts in the three scenarios of the producer price for selected agricultural commodities in Argentina. This country is an exclusively exporter of wheat and maize (Argentina is the number five wheat exporter in the world) and these two commodities do not have extra farm price support or export subsidies in Argentina. This is the reason why the producer or farm prices for these two agricultural commodities in Argentina are the same as the international prices shown in Table 5. According to the ATPSM manual, if the commodity is exclusively exported, the domestic wholesale and farm price are equal to the world market price plus the tariff equivalent of the export subsidy. For the other selected agricultural commodities shown in Table 6, there are very small differences with the international prices of Table 5, for the same commodities. This is because the other selected commodities (oilseeds, vegetable oils and barley) have some extra farm price support in Argentina, over and above the market access support. In the liberalization scenario of Table 6 for barley, the price variation is negative because the US$/ton is lower in the liberalization scenario than the baseline price for this commodity. It is not casual that in both Tables 5 and 6, wheat has the highest variations in the three scenarios, this means, the higher variation of the international price of a commodity, the higher

variation in the producer price, given no extra government support or subsidies, which is the case for Argentina in relation with this specific commodity, for example. In other words, these results shown in Table 6 are consistent with the international prices of Table 5, taking into account the low protection for Argentine agriculture. Another aspect to notice is the case for wheat, oilseeds and vegetable oils, which have the highest variations for the producer price; therefore, the production is oriented to the agricultural commodities in which the increments in the producer prices are higher. Consequently, Argentina will tend to specialize in the agricultural commodities in which it has comparative advantages, thanks to the abundance of land as an economic resource in Argentina.

Table 6: Evolution of producer prices in Argentina for selected products

	Baseline	Scenario 1		Scenario 2		Liberalization	
Product	**US$/ton**	**US$/ton**	**% change in prices relative to the base run**	**US$/ton**	**% change in prices relative to the base run**	**US$/ton**	**% change in prices relative to the base run**
Wheat	168.75	191.35	13.39%	192.08	13.83%	195.70	15.97%
Maize	146.60	150.51	2.67%	151.11	3.08%	154.52	5.40%
Oilseeds	288.33	311.29	7.96%	314.13	8.95%	323.83	12.31%
Vegetable oils	677.37	714.67	5.51%	721.57	6.53%	766.47	13.15%
Barley	148.57	150.24	1.12%	150.15	1.06%	148.14	-0.29%

Own elaboration.

Another topic is the percentage change in consumer prices relative to the base run for selected agricultural commodities in Argentina. Table 7 shows these results. Once again, the results of Table 7 follow the same behavior as the international price. Important impacts on the variations of consumer prices for wheat, oilseeds and vegetable oils can be found. For the rest of the selected agricultural commodities in Argentina, the impact is moderate due to the elimination or reduction of the government support for these commodities.

Table 7: Percentage change of consumer prices relative to the base run for selected products in Argentina

	Scenario 1	Scenario 2	Liberalization
Product	**% change in prices relative to the base run**	**% change in prices relative to the base run**	**% change in prices relative to the base run**
Wheat	13.39%	13.82%	15.96%
Maize	2.67%	3.08%	5.39%
Oilseeds	7.95%	8.93%	12.20%
Vegetable oils	5.46%	6.46%	12.90%
Barley	1.09%	1.00%	-0.56%

Own elaboration.

Table 6 and Table 7 can be analyzed together using the market equilibrium theory. In the equilibrium point both buyers and sellers are content with the quantity being traded and the price at which it is traded. Thus, price and quantity are simultaneously determined by the joint operation of supply and demand. This is the reason why the percentage change in producer and consumer prices relative to the base run was emphasized. According to this theory, if the percentage change of the producer price is exactly the same as the percentage change of the consumer price, the demand and supply for a specific commodity are in the equilibrium point (coefficient = 1), but if there is some difference in any percentage change, this means that the demand and supply are not in the equilibrium point, therefore there is some market price distortion for the commodity. This analysis is made in Table 8, which shows the relationship between the percentage change of consumer prices and the percentage change of producer prices. The results were obtained using the following formula:

$$C = \text{Coefficient} = \frac{\Delta\% \text{ Consumer Price}}{\Delta\% \text{ Producer Price}}$$

There are several cases in the analysis of this coefficient:

- Case A: "C = 1". Percentage changes in the consumer and producer prices are exactly the same, therefore, demand and supply are in the equilibrium point and there is not any price distortion. That is the case for wheat in the three scenarios and for maize in the first two scenarios.

- Case B: "C < 1". Percentage change of the producer price is higher than the percentage change of the consumer price. That is the case for maize in the liberalization scenario and for oilseeds and vegetables oils in the three scenarios. The first two scenarios of barley can also be considered in this situation. In this case, there is some price distortion in the producer price such as the domestic support policies and export subsidies.

- Case C: “C > 1”. Percentage change of the consumer price is higher than the percentage change of the producer price. That is the case for barley in the liberalization scenario. In this situation, there is some price distortion in the consumer price such as in-quota and out-quota tariffs.

When this coefficient is closer to one, the relationship between the two variations is higher. For example, in the case for the coefficient of wheat, both the consumer price as well as the producer price change in the same proportion and direction in the three scenarios, as a result, the coefficient in each scenario is one, the highest relationship possible between the two variables. Thus, in the case of the other selected agricultural commodities (maize, oilseeds, vegetable oils and barley) the coefficient is in general high, this means there is a strong relationship between the two percentage changes, in other words, there are not very significant price distortions.

Briefly, the closer the coefficient is to the unit, the prices vary in the same proportion. When the coefficient is far away from the unit, it shows that the percentage change of one price is higher than the other. In particular, when the coefficient tends to zero, it shows that the producer price has changed more than the percentage change of the consumer price.

The final case is when the coefficient tends to infinite, it shows that the producer price has changed in a less proportion than the percentage change of the consumer price.

Table 8: Coefficient for selected agricultural products in Argentina

	Coefficient = $\frac{\Delta\% \text{ Consumer Price}}{\Delta\% \text{ Producer Price}}$		
Product	**Scenario 1**	**Scenario 2**	**Liberalization**
Wheat	1.000	1.000	1.000
Maize	1.000	1.000	0.997
Oilseeds	0.999	0.998	0.991
Vegetable oils	0.992	0.990	0.981
Barley	0.967	0.940	1.948

Own elaboration.

5.2 Production

In view of the particularities of the ATPSM, it can be concluded that the impacts on world production are minimum. This situation can be explained by the fact that there is not a production function incorporated in the ATPSM model. Consequently, with neither information about the requirements nor work and capital resources and without any function that explains the production behavior, the impacts on world production have no significant value.

Table 9 shows the evolution of the production gross value for selected agricultural commodities in Argentina, for each one of the scenarios. In general, the impact in the three scenarios is positive, with the exception for barley in the liberalization scenario, its percentage variation is negative because the production gross value in this scenario is lower than the baseline. Another important detail to notice is how the total line is calculated. To reach the values shown in the total line of Table 9, other product

categories have been taken into account, such as meat, dairy products, fruits, tea, pulses and other products like tobacco leaves, for instance, in order to have a more realistic result. In scenario 1, the rise of the total production gross value is 8.53% in comparison with the 9.38% for scenario 2 and the 12.62% for the liberalization scenario, this means, the third scenario of total liberalization is the one with the highest production gross value and therefore, it seems to be the most convenient to Argentina.

The production gross value for wheat, oilseeds and vegetable oils are among the highest in the three scenarios. The special case for wheat, as it has repeatedly happened in both Table 5 (Evolution of the international price) and Table 6 (Evolution of the producer price in Argentina), has the highest impact on the production gross value in Argentina. As it has been mentioned before, Argentina is an exclusively wheat exporter, therefore, there is a high consistency and direct relation between the international price, producer price and production gross value for this specific commodity, for example.

Table 9: Evolution of the production gross value in Argentina for selected products

	Baseline	Scenario 1		Scenario 2		Liberalization	
Product	**Millions of US$**	**Millions of US$**	**% change in prices relative to the base run**	**Millions of US$**	**% change in prices relative to the base run**	**Millions of US$**	**% change in prices relative to the base run**
Wheat	2,724.7	3,311.9	21.6%	3,331.7	22.3%	3,430.7	25.9%
Maize	2,465.4	2,565.2	4.1%	2,581.4	4.7%	2,676.1	8.6%
Oilseeds	7,764.3	8,631.2	11.2%	8,739.8	12.6%	9,104.7	17.3%
Vegetable oils	3,635.8	3,908.3	7.5%	3,960.3	8.9%	4,310.3	18.6%
Barley	106.5	108.1	1.5%	108.0	1.4%	105.6	-0.9%
TOTAL	38,111.5	41,361.9	8.5%	41,687.3	9.4%	42,922.3	12.6%

Own elaboration.

There is a special situation with the production gross value of barley in Argentina. While in the two scenarios, the production result is positive, in the liberalization scenario there is a reversion in its production. This may be explained by the protective tariffs among the members of a commercial block, such as MERCOSUR (The Southern Common Market), where Argentina is a country member. Therefore, production is oriented to the agricultural commodities in which the increments are higher. Consequently, Argentina will tend to specialize in the agricultural commodities in which it has comparative advantages.

5.3 International trade

The analysis of the impacts in the international trade will comprise not only the impacts derived from the three scenarios in the economy of Argentina, but the effects in the global trade as well as its implications for MERCOSUR (The Southern Common Market), the United States, the European Union and the Cairns Group. This group is a coalition of 18 agricultural exporting countries, which account for over 25% of the world's agricultural exports. During the WTO Doha Round of negotiations, the Cairns Group has continued to push for the liberalization of trade in agricultural exports, a cause that unites the members of the Cairns Group across language, cultural and geographic boundaries. Made up of developed and developing countries across five continents, the Group is committed to achieving free trade in agriculture that provides real and sustainable benefits for the developing world. The Cairns Group is an excellent example of successful coalition building in the trade area. By acting collectively, it has had more influence and impact on the agriculture negotiations than any individual members could have had independently. The members of the Cairns Group are Argentina, Australia, Bolivia, Brazil, Canada, Chile,

Colombia, Costa Rica, Guatemala, Indonesia, Malaysia, New Zealand, Pakistan, Paraguay, the Philippines, South Africa, Thailand and Uruguay [5]. In this research the countries of the Cairns Group taken into account as a sample are Argentina, Australia, Bolivia, Brazil, Canada, Chile, Colombia, New Zealand, Paraguay and Uruguay and it will be called from now on, the Cairns Group Selected. The criteria for this selection are as follows, all these countries have similar commodities in their agriculture production. Some country clients of Argentina will be considered in the research, such as the United States and the European Union. Table 10 shows that the impacts of the export income for selected economies for each one of the scenarios. It can be noticed for the case of Argentina a significant rise in export income, which varies in a range from 23.64% (scenario 1) up to 26.33% (scenario 2), meanwhile, in the case of total liberalization of trade, export income will increase up to 38.50%. It can be concluded that in quantity magnitudes, the application of the modalities will generate an additional income of foreign exchange into Argentina for around US$2,000 and US$4,000 millions of dollars.

Table 10: Evolution of export income for selected economies

Economies	Baseline	Scenario 1		Scenario 2		Liberalization	
	Millions of US$	Millions of US$	% change in income relative to the base run	Millions of US$	% change in income relative to the base run	Millions of US$	% change in income relative to the base run
Argentina	10,039.3	12,412.2	23.64%	12,682.3	26.33%	13,904.6	38.50%
Mercosur	24,029.6	29,205.8	21.54%	29,900.7	24.43%	32,769.6	36.37%
United States	39,119.7	44,063.3	12.64%	44,619.1	14.06%	47,554.9	21.56%
European Union	23,553.8	24,255.7	2.98%	24,398.8	3.59%	25,238.0	7.15%
Cairns group selected	56,188.8	65,959.5	17.39%	67,066.1	19.36%	72,150.4	28.41%
WORLD	196,601.8	224,692.4	14.29%	227,977.7	15.96%	245,557.9	24.90%

Own elaboration.

[5] **The Cairns Group**. *An Introduction.* Online, THE CAIRNS GROUP, Internet, 3 May. 2007.

On the other hand, the European Union could be the principal "stricken" region, in comparative terms, because its exports will only rise 7% in the total liberalization scenario, this is the region with the minimum rise in its export income. Nearly with the same tendency, the variation of the export income for the United States is just moderate, and lower than Argentina, MERCOSUR and the Cairns Group, in a descending order, for every one of the three scenarios.

The positive tendency is also shown in the MERCOSUR market. The application of the modalities will result in an increase of the export income from 21.54% up to 24.43%, an equivalent of around US$ 5,000 millions dollars increase, depending on the scenario analyzed, and in the total liberalization scenario, the variation reaches 36.37%.

The bottom line of Table 10 is calculated taking into account a larger group of developing as well as developed countries of the world, such as Brazil, Paraguay, Uruguay, Bolivia, Chile, Australia, Canada, China, Colombia, Egypt, India, Mexico and New Zealand. At the global level, the application of the modalities will produce a market growth of around 14.29% and 15.96%, in the first two scenarios, meanwhile in the total trade liberalization scenario, global export income will rise to 24.9%.

In brief, the application of the modalities will benefit more the developing countries than the developed ones, in terms of additional export income.

Table 11 shows a summary of the impacts on trade balance of selected economies analyzed in the present research, and for the studied agricultural commodities. In the case of Argentina, for example, the impact in the trade balance for each scenario is similar to the rise of its export income, there is an increase of trade balance from

28.19% to 31.16%, for the first two scenarios, and in the total liberalization scenario, the variation is 42.72%. In the case of United States, it is important to notice that the highest increase in percentage change in trade balance belong to this country, for each one of the three scenarios. In general, all the food producer countries have a positive trade balance, with trade surplus. Meanwhile, those countries, which are not major food exporters, have a strong domestic demand or subsidy their production, such as the European Union, which has a huge trade deficit in the three scenarios. The European Union is a particular case, the application of any of the scenarios will increase its trade deficit in more than 400%.

Table 11: Evolution of trade balance for selected economies

Economies	Baseline	Scenario 1		Scenario 2		Liberalization	
	Amount	Increase or decrease		Increase or decrease		Increase or decrease	
	Millions of US$	Millions of US$	% change relative to the base run	Millions of US$	% change relative to the base run	Millions of US$	% change relative to the base run
Argentina	9,300.61	2,622.15	28.19%	2,897.83	31.16%	3,973.29	42.72%
Mercosur	19,009.49	6,007.51	31.60%	6,745.82	35.49%	8,906.42	46.85%
United States	20,257.83	7,844.10	38.72%	8,686.29	42.88%	12,152.35	59.99%
European Union	-4,031.96	-16,368.93	-405.98%	-16,593.66	-411,55%	-16,846.86	-417.83%
Cairns Group selected	43,042.80	9,591.24	22.28%	10,640.62	24.72%	14,460.82	33.60%

Own elaboration.

Table 12 shows the evolution of export volumes for selected agricultural commodities of Argentina. It can be seen that the increase in the export volumes for Argentina's oilseeds is very significant and has the highest rates in the three scenarios. This table corroborates the fact that Argentina is the number three exporter of soybean in the world and also, it is the number five wheat exporter of the world. Besides, Table 12 shows the significant rise for wheat exports, which reaches around 12% for Scenario 1 and 14% in the trade liberalization scenario. It is important to notice the export increase for oilseeds for about 42.59% for Scenario 1 and 65.40% for the total liberalization case.

Table 12: Evolution of Argentina's exports

	Baseline	**Scenario 1**		**Scenario 2**		**Liberalization**	
Products	Thousands of tons	Increase or decrease in thousands of tons	% change relative to the base run	Increase or decrease in thousands of tons	% change relative to the base run	Increase or decrease in thousands of tons	% change relative to the base run
Wheat	11,413.0	1,351.2	11.84%	1,393.8	12.21%	1,614.2	14.14%
Maize	11,124.7	218.9	1.97%	264.4	2.38%	579.5	5.21%
Oilseeds	4,943.2	2,105.3	42.59%	2,385.3	48.25%	3,232.7	65.40%
Vegetable oils	4,060.4	139.2	3.43%	170.3	4.19%	382.5	9.42%
Barley	36.8	0.1	0.36%	0.1	0.30%	-0.2	-0.62%

Own elaboration.

Table 13 shows the market share of Argentina, MERCOSUR, United States, European Union and the Cairns Group Selected in the global market, for the three scenarios concerning selected agricultural commodities, such as wheat, maize, oilseeds, vegetables oils and barley. In the three scenarios the United States have the highest relative participation in the world market for two specific agricultural commodities: maize and oilseeds, due to the huge North American production and exports of the products mentioned, followed in the second place by the Cairns Group selected. On the other hand, the Cairns Group is the leading trade coalition in the world market share for wheat, also in the three scenarios. Argentina is an important member of the Cairns Group, and in the case of the wheat market, Argentina is the number five wheat exporter of the world. Only by itself, it has around 11% of share in the wheat market of the world, almost the same percentage for all the countries comprising MERCOSUR, in the three scenarios.

The European Union has the major market share in the barley world market, with a range from around 57% to 58% in the three scenarios. The European Union is loosing its market share in the maize and oilseed world markets, the same commodities where the United States have a strong and leading participation, but at the same time, they are loosing participation in the vegetable oil world market. One possible explanation of the huge market share of some countries in certain agricultural commodities is the possibility that all the product categories are homogenized, that is, there are no differences in terms of quality. The European Union with the reduction of its export subsidies for wheat, looses an important share of the wheat market, as well as the United States but in a lesser magnitude. Argentina and MERCOSUR are loosing their market shares in the world barley market, coincidently with the same percentage of less than 0.20% in all the scenarios.

The rest of the world concentrates the major market share for vegetable oils, with around 66% for all the scenarios. In general, the trade liberalization implies the decrease of market share for the developed countries concerning the selected agricultural commodities analyzed in the present research, and the increase of market share for the rest of the world.

Table 13: Evolution of the world market share for selected products and economies

	Argentina	Mercosur	United States	European Union	Cairns Group selected	Rest of the world
Wheat						
Baseline	10.73%	10.84%	26.80%	14.11%	45.23%	12.03%
Scenario 1	10.71%	10.83%	24.71%	10.88%	44.10%	13.92%
Scenario 2	10.69%	10.81%	24.63%	10.83%	44.02%	14.03%
Liberalization	10.64%	10.75%	24.32%	10.65%	43.74%	14.27%
Maize						
Baseline	14.86%	15.18%	65.74%	0.33%	15.70%	3.83%
Scenario 1	14.56%	14.87%	65.37%	0.31%	15.37%	4.17%
Scenario 2	14.48%	14.79%	65.26%	0.30%	15.29%	4.30%
Liberalization	14.09%	14.38%	64.71%	0.28%	14.86%	4.78%
Oilseeds						
Baseline	7.91%	30.24%	46.67%	1.45%	41.90%	7.81%
Scenario 1	9.88%	31.81%	43.69%	1.30%	42.24%	8.54%
Scenario 2	10.09%	32.03%	43.32%	1.28%	42.30%	8.62%
Liberalization	10.59%	32.43%	42.07%	1.21%	42.19%	8.86%
Vegetable oils						
Baseline	15.10%	19.20%	3.41%	7.74%	21.76%	65.97%
Scenario 1	15.33%	19.39%	3.35%	7.50%	21.91%	66.14%
Scenario 2	15.37%	19.42%	3.34%	7.48%	21.94%	66.14%
Liberalization	15.53%	19.80%	3.25%	7.27%	22.25%	66.15%
Barley						
Baseline	0.19%	0.19%	5.56%	54.75%	25.42%	14.27%
Scenario 1	0.18%	0.19%	5.08%	56.90%	24.22%	13.73%
Scenario 2	0.18%	0.18%	5.06%	57.06%	24.12%	13.69%
Liberalization	0.18%	0.18%	4.90%	57.94%	23.54%	13.52%

Own elaboration.

5.4 Welfare

Welfare in the ATPSM model has three components. The first, producer surplus, is the aggregate difference between price and marginal cost plus any quota rent received on exports. The second, consumer surplus, is the aggregate difference between marginal valuation and price. The third, net government revenue, only relates to revenue from import tariffs, including both within-quota and out-of-quota tariffs, and expenditure on export subsidies and domestic support. The fall in the domestic price resulting from a unilateral tariff cut reduces producer surplus and increases consumer surplus in that country. It also results in a reduction in government revenue if the initial tariff is small and there are no tariff rate quotas.

Given that out-of-quota tariff is assumed to be binding, government revenue will fall following a reduction in within-quota tariffs, a reduction in out-of-quota tariffs or an increase in the tariff rate quota. This involves a transfer of out-of-quota tariff revenue to quota rents.

The net effect of a unilateral tariff cut on a particular commodity is an increase in aggregate welfare for the country unless that country is able to influence the world price of the commodity as a result of its size in the market. In this case, there will be some optimal tariff level for that country in that market.

In the rest of the world, the increased world price leads to an increase in producer surplus and a fall in consumer surplus. However, the reduction in the out-of-quota tariff could mitigate somewhat the increase in producer surplus in the rest of the world through a reduction in quota rents. The change in government revenue is indeterminate. There will be an increase in government revenue if the elasticity of demand for the commodity in that country is less than one. Those countries that are

net exporters of the commodity experience a gain in welfare (in the absence of changes in quota rents) while those countries that are net importers experience a loss. The net effect is a global increase in welfare.

When a country unilaterally reduces its export subsidies on a commodity, the results in the domestic economy are similar. There is a fall in the domestic price, as producers can no longer receive a higher price from exporting the good. There is an increase in demand and a reduction in supply of that commodity in that country that leads to an increase in the world price. Domestic producer surplus falls and consumer surplus increases. However, government expenditure unambiguously falls as a result of the reduction in the export subsidy. Again, the net effect is an increase in aggregate welfare for the country unless that country is able to influence the world price of the commodity as a result of its size in the market.

Table 14 shows the impacts in the welfare for selected economies such as Argentina, MERCOSUR, United States, European Union and the Cairns Group selected. In order to calculate the bottom line of Table 14, some other developing and developed countries were also considered, such as Brazil, Paraguay, Uruguay, Bolivia, Chile, Australia, Canada, China, Colombia, Egypt, India, Mexico and New Zealand.

In general, the modalities proposals (Scenario 1 and 2) have positive impacts in the estimated world welfare, while on the other hand, the proposal of total trade liberalization could have small negative impacts in the estimated world welfare, as it can be seen in Table 14.

Table 14: Evolution of welfare for selected economies

Economies	Scenario 1			Scenario 2			Liberalization		
	Producer surplus variation in millions of units	Consumer surplus variation in millions of units	Welfare variation in millions of units	Producer surplus variation in millions of units	Consumer surplus variation in millions of units	Welfare variation in millions of units	Producer surplus variation in millions of units	Consumer surplus variation in millions of units	Welfare variation in millions of units
Argentina	2,622.5	-1,672.9	912.8	2,648.4	-1,831.5	775.0	3,038.6	-2,260.6	692.6
Mercosur	6,865.4	-5,520.3	1,489.2	7,312.1	-6,100.9	1,324.2	7,638.5	-5,976.7	862.8
United States	8,361.3	-7,290.6	1,095.0	8,582.1	-8,067.9	556.5	10,929.1	-10,722.4	-2,371.6
European Union	-40,169.8	39,480.5	6,570.8	-41,514.6	41,056.7	6,601.4	-45,930.7	47,033.4	-9,523.4
Cairns Group selected	9,985.0	-5,473.1	4,952.9	10,107.3	-6,065.6	4,402.5	9,790.1	-5,555.4	1,773.0
WORLD	-41,.593.7	63,735.6	22,.228.1	-47,855.3	71,.510.4	22,460.8	-65,659.3	102,133.6	-5,579.2

Own elaboration.

In the scenario of total trade liberalization, the European Union could be the worst affected, followed by the United States. It is convenient to notice that in the modalities proposals (Scenario 1 and 2) both the United States and the European Union win in terms of welfare. The explanation is as follows: in the European Union, the rise of the consumer surplus is higher than the fall of the producer surplus, and for the United States, the situation is the inverse.

For the case of Argentina, the welfare implications are positive. The three scenarios generate an increase in the country welfare, as a result of a strong rise in the producer surplus, which is higher than the decrease of the consumer surplus due to the rise of the commodity prices. But, it is important to notice that the welfare in Argentina is higher in Scenario 1, moderate in Scenario 2 and lower in the Total Liberalization

Scenario, therefore, Scenario 1 seems to be the most advantageous for Argentina in terms of welfare, but a definitive decision related to choose the best scenario for Argentina must take into consideration other important issues, which will be discussed later.

5.5 Conclusions

This research has as a major objective the analysis of the economic impact of agriculture trade liberalization in Argentina. In order to accomplish this goal, some specific agriculture commodities were chosen in the research, such as wheat, maize, oilseeds, vegetable oils and barley. The reason why these particular commodities were selected is because Argentina has a long tradition as a major food producer and food exporter in the world: Argentina is the number one exporter of soybean meal and soybean oil in the world, it is the number three exporter of soybean in the world and finally, Argentina is the number five exporter of wheat in the world.

The proposal to the WTO was organized in three scenarios, each one is related to a particular modality or objective, ranging from the most conservative (Scenario 1) to the most liberal in terms of total free trade (Scenario 3), both for developed countries as well as for developing countries. There are slight differences in the proposal to the WTO for the two groups of countries, such as the in-quota tariffs and the out-quota tariffs. Each of the three scenarios or modalities were analyzed in terms of their impacts on prices, production, international trade and welfare, with the help of a model tool, the ATPSM, the Agricultural Trade Policy Simulation Model, a software programmed and designed by the UNCTAD.

After the analysis and discussion of the economic impacts of each scenario on prices, production, international trade and welfare, in the previous pages of the research, particularly the last economic variable, welfare, seems to be the one to take into account in order to reach a final decision to decide which modality is the best suitable for Argentina. As it was discussed in the previous section, there is some evidence obtained as a result of the analysis made with the help of the ATPSM that considers the Scenario 1 as the most suitable for Argentina because it gives the highest welfare result for this country, in comparison with the other scenarios. However, as it has been stated before, a final and definitive decision cannot be reached at this moment, because there are some major and sensitive issues to be taken into account and which need a more profound study.

These major issues can be organized into two groups: the system restrictions of the ATPSM and other trade related concerns.

About the system restrictions of the ATPSM, it has already been mentioned that the model is deterministic, static and it is a partial equilibrium model. It focuses on standard agricultural trade policies, but in the real market world there is a wide range of non-quantifiable trade policies, such as sanitary and phytosanitary regulations, seasonal import restrictions and anti-dumping measures. Another example of non-quantifiable policies is found in the farm price support over and above the market access measures, such as subsidies on agricultural inputs, research and developing financing, favorable interest rates and amortization periods on loans, etc. In addition, the price and tariff data used in the model is only updated to the year 2000 or 2001. As it has been previously noted, the model does not have a time dimension. Therefore, nothing can be inferred about the time length within which the economic effects

would be fully realized. The general interpretation is that the economic effects are of a long-term nature, with the implementation spread over several years. The elasticities that govern supply and demand responses to price changes have been estimated based on a 10-year time horizon.

Another limitation is the unfilled import quotas. It is assumed here that within-quota tariffs are not relevant in price determination, even where quotas are unfilled. This means that the higher out-of-quota tariffs or applied tariffs are taken as determining domestic prices. This assumption overstates the benefits of liberalization, as there may be cases where within-quota rates are the relevant determinant of domestic prices. A further limitation is the handling of preferences. The model assumes that import quotas are filled regardless of the size of the rent. The benefits of preferential access are eroded when liberalization that is more general occurs, and this is not captured completely by the model. The erosion of quota rents is taken into account but the trade creation and diversion effects are not. Another aspect occurs in the absence of quality data, bilateral quotas are allocated by a complex procedure based on each country's imports and exports. Quota rents are proportionate to trade flows. Unfortunately, there is no simple means of specifying particular bilateral quotas if or when better data become available.

Finally, there is a discussion about model parameters and policy data. Some countries in the model do not have policy data. Data quality is particularly an issue where there are many commodities and countries to deal with. In addition, there are problems in aggregating policy data across several tariff line items, and reliable information on applied rates, which are not notified to the WTO, therefore valuable data is not available for some countries.

The second group of major issues is the other trade related concerns and they are a

wide range of sensitive topics that have to be taken into account and analyzed when an international trade policy decision has to be made. Some of these major topics are as follows:

- The trade in services, in order to promote the economic growth of all trading partners and the development of developing and least-developed countries. In January 2000, the General Agreement on Trade in Services was initiated under the sponsorship of the WTO.
- The Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement), which supports for example the access to public health, as well as to existing medicines and the research and development of new medicines.
- Trade and investment, the role of FDI (Foreign Direct Investment) as a major contributor to the expansion of trade.
- Transparency in government procurement, in order to promote clear rules to market access in public biddings.
- Trade and environment, it focuses the effects of environmental measures on market access, especially for developing countries, such as for example the Biological Diversity Convention and the environmental labeling requirements.
- Electronic commerce, it creates new challenges and opportunities for trade for members at all stages of development, and the importance to create and maintain an environment, which is favorable to the development of electronic commerce.
- The relationship between trade, debt and finance. Some efforts should be made to find a durable solution to the problem of external indebtedness of developing and least-developed countries, and to strengthen the coherence of international trade and financial policies.
- The relationship between trade and transfer of technology, which is considered as an

important means to accomplish development, quality and productivity. The increase of flows of technology to developing countries should be emphasized.

- The special case of the least-developed countries. The integration of the Least Developed Countries into the multilateral trading system requires meaningful market access, support for the diversification of their production and export base, and trade-related technical assistance and capacity building.

As far as now, it has been proved that in order to reach to a final decision in the case of the most suitable modality for Argentina, there are many considerations as well as sensitive issues to be studied and analyzed in a more profound manner. Although there are some evidence, which may direct to a particular direction, it is not possible to establish a definitive solution, unless many other important issues are also studied and considered, which may be the subject for future and related investigations.

The Article 20 of the Doha Ministerial Declaration states the long-term objective to establish a fair and market-oriented trading system through a program of fundamental reform. The purpose is to correct and prevent restrictions and distortions in the world agricultural markets. This is the context in which a major and delicate question has to be made in relation with the international prices for agricultural commodities. If the objective of the Doha Declaration is to correct and prevent market distortions, then, how can be understood that some major developed countries strongly subsidy their agriculture? The ATPSM analyses the impact of the modalities in the international world price for the selected commodities, but is there any confidence that the international commodity prices do not reflect price distortions due to the agricultural

subsidies in some major developed countries? The answers for these questions are still being discussed in the principal world trade forums nowadays.

Another conclusion of the research is the fact that production is oriented to the commodities in which the rise of the price for producers is higher. In addition and taking into account the relocation in world production, it can be seen the fulfillment of the economic theory postulates, countries like Argentina tend to specialize in specific products in which they have comparative advantages, thanks to a relative major resource which they have, land for this particular country. This is the reason why Argentina is the number one exporter of soybean meal and soybean oil in the world, these oilseeds are cultivated in a much-extended territory, called the Pampa.

It should be noticed the case for the Least Developed Countries. In this specific situation, the ATPSM model has serious limitations because it is not possible to make policy simulations for this specific group of countries, due to the lack of actual and accurate data. Therefore, the analysis in this particular case is of no practical value.

From the analysis of the results obtained using the Agriculture Trade Policy Simulation Model (ATPSM), it can be concluded that the proposal of the modalities could have strong impacts in the domestic and international level. The effects can be observed in the price, production, international commerce and welfare.

The proposal of the modalities seems to be a win-win negotiation type, where all the participants generally get positive results. In the global level, the reduction of domestic support, tariffs and subsidies will generate an increase in the global welfare, with the exception of some economies (United States and the European Union, for

example) in the total free trade scenario. It is noticeable that depending on the position for each country in relation of its trade balance of food products, the transference of resources which generate a positive net balance in welfare could be originated from the consumers to the producers, or vice versa.

The trade liberalization scenario will have in general a positive effect for the developing countries, the total production gross value will increase as well as the prices, resulting in better terms of trade. The reduction and/or elimination of trade distortions to the agriculture will tend to improve the global distribution of income.

In the world, it is possible in general, to improve the welfare of the countries without making some other countries worse off, in other words, the Pareto-efficient allocation is valid in this context.

Finally, in the case of Argentina, the economic impacts of this proposal to the WTO concerning agricultural issues seem to have some positive effects, such as the increase of the country exports with the consequent rise of foreign income. Argentina will be able to develop regional economies (for the case of tobacco, for example) and to relocate its production to other areas (for the case of dairy products, for example), with an export-oriented economic policy in the final destination of its commodities, but a definitive answer can not be reached because there is a wide range of very important and sensitive issues which have to be studied and analyzed in a more profound manner, in future and related investigations.

APPENDICES

APPENDIX A

SOME EXTRACTS FROM THE

AGRICULTURAL TRADE POLICY SIMULATION MODEL

HANDBOOK

(ATPSM VERSION 3.1 JANUARY 2006)

The development of ATPSM was initiated by UNCTAD in 1988. A detailed description of the model and its results was published for the first time in 1990, in a United Nations study entitled, *Agricultural Trade Liberalization in the Uruguay Round: Implications for Developing Countries* (UNCTAD/ITP/48). In the late 1990s, the model was significantly enhanced in a joint effort by UNCTAD, with funding from the United Kingdom Department for International Development, and the Food and Agriculture Organization of the United Nations (FAO) to address issues arising from the outcome of the Uruguay Round. The model database coverage was increased to enable policy analysis in an increasing number of commodities and countries. The model equations were refined to enable the analysis of changes in tariff quotas and tariff quota rates and to distinguish between bound and applied tariff rates.

The model consists of a system of equations that represent supply, demand and trade flows for different agricultural goods in different countries. In an attempt to simulate the real world a number of assumptions are made. The model is deterministic. There are no stochastic shocks or other uncertainties. It is static. There is no specific time dimension to the implementation of policy measures or to the maturing of their economic effects. Finally, it is a partial equilibrium model. Whereas the model aims at estimating far-reaching details of the agricultural economy, it does not deal with the repercussions of barrier reductions on other parts of the national economy. Thus, effects on the industrial and service parts of the economy or the labor market are not subject to analysis.

The ATPSM focuses on standard agricultural trade policies, such as tariff cuts, subsidy reductions and quota changes. However, a number of other agricultural trade interventions exist, such as sanitary and phytosanitary regulations, seasonal import

restrictions and anti-dumping measures. Such interventions cannot be simulated unless a tariff equivalent can be derived. The ATPSM has a global coverage of agricultural commodities with protection barriers that significantly distort world trade. It estimates the effects of barrier reductions on terms of trade, tariff revenues, welfare, supply and demand allocation and prices. It takes into account almost all the agricultural trade policy measures having computable economic effects.

The present version of the model covers 176 countries and includes all larger economies. The countries that are not explicitly covered by the model are mostly small island economies and are included in the Rest of World. The economy of each country is represented individually, except the 15 countries that are part of European Union which are represented as a single country group.

The lack of agricultural trade policy data prevents extended policy analysis for some countries. In the present version of the model, no policy data are available for 20 countries. For a further 37 countries there are either no applied or no bound tariff rates available. These countries are essentially price takers in the model, with domestic prices moving with world prices and production, consumption, exports and imports adjusting accordingly.

There are several predefined country and commodity groups available. One category of groups is the partition in Developed, Developing and Least Developed Countries. Each country in the model belongs to one of these three groups. Another classification is regional. There are eleven regional groups and, again, every country belongs to one and only one of these eleven groups. The predefined regions are Caribbean, Central America, Central and Eastern Europe, Central Asia, North Africa and the Middle East, North America, Oceania, South America, South, East and South-East Asia, Sub-Saharan Africa and Western Europe.

While ATPSM can analyze many general trade policy issues, its main purpose is to simulate and evaluate the various agricultural trade policy changes that may be suggested for or in the WTO negotiations on agriculture. The present version 3.1 can simulate general policy changes common for all countries and commodities involved in these negotiations or policy changes specific to individual countries or groups of countries. The model produces five categories of economic estimates for each country:

- Volume changes in production consumption, imports and exports;
- Trade value changes – changes in export, import and net trade revenue;
- Welfare changes – changes in producer surplus, consumer surpluses; and net government revenue;
- Price changes – world market, wholesale (consumer) and farm prices;
- Changes in tariff quota rents – forgone and receivable.

As previously noted, the model does not have a time dimension. Therefore, nothing can be inferred about the time length within which the economic effects would be fully realized. The general interpretation is that the economic effects are of a long-term nature, with the implementation spread over several years. The elasticities that govern supply and demand responses to price changes have been estimated based on a 10-year time horizon. There is a distinct difference in the speed of reaction between demand and supply response to price changes. The reaction of the former is relatively quick, with full response from one to two years. The full response of the latter, however, may be from one to more than ten years, depending on the commodity. If there were an immediate reduction in trade barriers, this imbalance in the timing of responses could create a temporary disequilibrium. As the lag in supply response

would be greater than that in demand there could be an excessive increase in prices or a substantial reduction in the stocks (or both). However, as negotiated reductions in trade barriers are generally spread over several years, the impact of the potential imbalance resulting from differing response times is likely to be minimal.

In ATPSM the changes in supply and demand are estimated from percentage changes in domestic prices. To estimate the percentage change in domestic prices from trade policy changes all tariffs must be expressed as a percentage of the world market price. In ATPSM specific and mixed tariffs are converted into ad-valorem equivalents. In ATPSM tariff cuts are expressed as a percentage of the initial tariff. The default method in the model for implementing tariff cuts is to reduce all tariffs by an equal percentage (linear cuts). However, alternative methods have been suggested and implemented in previous negotiating rounds. One of these methods is the Swiss formula, which makes progressively higher proportional tax cuts in progressively higher tariffs. Global and specific tariff cuts using this method can also be simulated in ATPSM. Other cuts include the Harbinson bands approach and a pre-specified Cancun or blended formula. Final tariffs can also be set to a maximum or to a pre-specified target level.

Export subsidies and extra farm support are measured as tariff ad-valorem equivalents in the model. Hence, cuts in these supports are measured as percentage reductions of the ad-valorem equivalents. The model is capable of analyzing global trade policy changes, specific trade policy changes to individual countries and commodities or some combination thereof. Tariff quotas are expressed in volumes. A policy change is expressed as a percentage change of the quota. Positive changes in tariff quotas allow more imports to enter under a lower within-quota tariff.

In the model domestic prices are determined as a function of world market prices and of the support measures, tariffs, subsidies and quotas. There is no independent behavior of domestic prices. In addition, no account is taken of domestic trade margins. Domestic prices have the character of border wholesale prices. An exception is the farm (supply) price, which might be affected by extra farm price support (for example, deficiency payments) over and above the market access support.

In the ATPSM datasets a country is often an importer and exporter of the one (aggregated) good. To accommodate this feature of trade data, composite tariffs for determining the domestic consumption and production price are estimated. This is in contrast with other trade models that determine domestic demand with a nested import demand structure, which requires knowledge of import elasticities between all foreign goods, so-called Armington elasticities. These elasticities are notorious for their importance in determining trade model outcomes, but little detailed quantitative assessment of them has been done.

One of the attractive properties of the price specification is that where a commodity is exclusively imported, the wholesale and farm price are equal to the world market price plus the import tariff. Similarly, if the commodity is exclusively exported, the domestic wholesale and farm price are equal to the world market price plus the tariff equivalent of the export subsidy.

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