

Distortions to Agricultural Incentives in Argentina

Adolfo C. Sturzenegger* and Mariana Salazni°

*W Universidad Nacional de La Plata
sturzeneggeribcp@ciudad.com.ar

°Universidad Torcuato Di Tella
msalazni@gmail.com

Agricultural Distortions Research Project Working Paper xx, October 2006

This is a product of a research project on Distortions to Agricultural Incentives, under the leadership of Kym Anderson of the World Bank's Development Research Group. The authors are grateful for helpful comments from workshop participants and for funding from World Bank Trust Funds provided by the governments of Ireland, Japan, the Netherlands (BNPP) and the United Kingdom (DfID).

This Working Paper series is designed to promptly disseminate the findings of work in progress for comment before they are finalized. The views expressed are the authors' alone and not necessarily those of the World Bank and its Executive Directors, nor the countries they represent, nor of the institutions providing funds for this research project.

We are grateful to Mario Arbolave, Ines Butler, Gustavo Conosciuto, Silvia Córdoba, Alejandro Fried, Luis Lubertino, Carlos Rossi, Juan Martín Rebolini, for their help and time. We also thanks, Servicios y Marketing Agropecuario S.R.L. (SEMA), Swift Armour S.A. Argentina, Arpov, and Sociedad Rural Argentina, for providing useful information.

Distortions to Agricultural Incentives in Argentina

Adolfo C. Sturzenegger and Mariana Salazar

Introduction and summary

The purpose of this paper is to study the existence of distortions in the agricultural sector in Argentina. It is a case study of the World Bank project *Poverty Alleviation Through Reducing Distortions to Agricultural Incentives* which includes many countries covering more than ninety percent of world agricultural production.

Such World Bank projects adopt a common methodology for all countries, where distortions are defined as those that are originated in government policies. For our study we have selected ten products which are basically exportables, or behave as exportables. For these types of products, the distortions we consider are external trade policy distortions.

The Argentine case of agricultural external trade policies is really interesting, and probably a unique one. It does not fit well in the experience of developed countries neither in that of the developing ones.

While developed countries, on account of several national (economic, social and political) objectives such as food self sufficiency, reducing migration out of the rural areas, political goals and others, strongly assist agriculture through domestic and export subsidies and tariff and non tariff protection, Argentina also on account of national objectives, strongly and persistently disprotects rural production.

While developing countries, on account of alleviating rural poverty and improving personal income distribution for the nation as a whole, have supported farm producers through tariff protection, producer subsidies, marketing boards, minimum price schemes and other instruments, Argentina also on account of national distributive goals has supported strong discriminatory taxation against agricultural production.

So, the purpose of this paper is to tell the story about such unexpected economic policy behavior towards the agricultural sector. The story includes measures of the level of distortions against agriculture, their evolution (trends and fluctuations around trend) since 1960 to the present, the non-agricultural national objectives that were taken into account to disprotect agriculture, the reaction of rural pressure groups and future policy prospects.

Briefly, the organization of this paper is as follows: in the next section there is a short description of the evolution of economic facts and policies along the last decades. The third section presents a brief description of the agricultural sector, remembering its importance in the economy, in exports and in employment. It will be commented how the sector has been changing along the period of analysis, its major technological innovations, the appearance of new forms of farm organization, and the impact on it of the early 1990s economic policy reform.

The fourth section describes the methodological and measurement context adopted for the estimation of the different distortions indicators. It defines the type of distortions measured, trying to separate clearly which kind of changes in agricultural incentives will be considered distortions and which will not. There are two previous studies, Sturzenegger et al. (1990) and Valdés and Schaeffer (1995), from which some measures will be incorporated to our study for the period 1960-1993. Also will be explained in this section how were selected the ten products that are considered in this study.

The next section reflects the core of our work. In its first part, it is described what type of indicators of distortions was measured, and the main aspects of the methodological procedures adopted. For the six primary products selected the following indicators are estimated: Nominal Rates of Assistance, both at the farm level of the value chain (NRAf) and at the border level (NRA), and Direct Rates of Assistance at the farm level (DRAf). For the four lightly processed products selected, NRAp at the processing level, are presented. Also aggregated DRAf for the six primary products and for all agriculture, are tabulated. A Direct Rate of Assistance is estimated for all non-agricultural sector (DRAN), and finally, adding DRAA and DRAN, a Total Rate of Assistance to Agriculture (TRAA), a Relative Assistance Index (RAIf) and Anti-Trade Bias Indexes (ABI), are obtained. In the second part, the main characteristics of the quantitative results are discussed. The most interesting result is that the NRAs (basically export taxes) in Argentina had a very peculiar behavior. Export taxes have played a compensating role of changes on agricultural incentives that come through changes in the real rate of exchange (RER), or in international prices of agricultural products, or in total factor productivity (TFP) for specific products. Additionally, that peculiar role has been also "perverse" in the sense that distortive assistance was stronger when the welfare cost of such distortion was larger.

The sixth section analyzes a political economy scheme that explains the peculiar compensatory and perverse role played by export taxation in Argentina. Pressure group action of rural interests is an important component of that scheme. Also, our explanation will

suggest that such taxation is a good example of the idea of “endogenous tariff”. The last section elaborates on future prospects for agricultural disprotection in Argentina.

Growth, delay and instability in the Argentine economy

The Argentine economy experienced rapid growth during the six decades before the Great Depression of the 1930s. The three main sources of growth were: labor input supported mainly through large European migration inflows; capital input supported by large inflows of foreign direct investment (FDI) and investment loans from Europe (mainly from Great Britain) and the United States; and increase in TFP mainly resulting from education, technological progress embedded in FDI and innovations introduced in production, domestic and international transportation, and commercialization of agricultural products.

In that period there was no Central Bank in Argentina, prices were strongly stable, the public sector was small and management of public accounts was, in general, characterized by strong fiscal responsibility. The economy was very open, with international trade, exports plus imports, representing more than 60 percent of GDP. There was no direct taxation on agricultural exports, and rural production only experienced a mild indirect negative discrimination through tariff protection to industrial importables of around 20 percent (Diaz Alejandro 1975). Impulses for industrialization were appearing but at a moderate and balanced pace.

The world crisis of the 1930s had a strong negative impact on the economy as a result of two main factors: there were large outflows of foreign capital and the agricultural sector, the most important in that period, experienced a decline in international agricultural prices. Fortunately the policy reaction was swift. To support the agricultural sector two regulatory agencies were created, the National Board of Meat and the National Board of Grains. Also, new major national taxes were established: sales and income taxes. Additionally, the Central Bank was created.

Industrial incentives appear somewhat stronger in the 1930s as a consequence of the improvement in industrial international relative prices and because domestic tariff barriers on industrial imports rose. Foreign exchange controls were introduced in 1931 and importers were required to have a permit to buy at the official exchange rate (Berlinski 2002).

Consequently, as a result of the combination of such changes, the trade share started to decline. Anyway, export taxes on agricultural products were not introduced in this period.

The next difficult period was during the Second World War. Two events occurred that later became strong determinants of post-war economic policy. First, the economy became strongly closed. Imports of industrial goods were negligible and agricultural exports, because of the reduced shipping opportunities, were very low. On this account, agricultural versus industrial domestic relative price fell by 30 percent (Sturzenegger 1991). Second, during the war, Argentina accumulated large physical and financial assets. Physical assets included the accumulation of great stocks of beef and grains as a result of the low level of agricultural exports; and financial assets grew because the economy experienced a large current account surplus given the difficulties to import.

Supported by high domestic relative prices, industrial production expanded very strongly during the war. Yet, in the early post-war years, agricultural domestic relative prices started to rise, triggered by the increase in international prices of food and in the re-establishment of industrial imports. In order to maintain war levels of industrial production, the new Peronist government introduced export taxes and other measures (discrimination against wheat reached levels larger than 50 percent in early post-war years) to block a full transmission to domestic prices and to domestic wages of the high levels of international prices of food. Another reason was to avoid a real appreciation of the peso which also would have reduced incentives for import competing industries. Industrial support was additionally supplemented by strong tariff and non-tariff protection. High direct and indirect discrimination against agricultural production was set in motion in those years in Argentina.

On the other side, as a result of the accumulation of physical and financial assets during the war and the increase in international prices of food in the early post-war years, the Argentine economy and the new government had available a high level of extraordinary resources. Then, the government decided to mount a well developed welfare state policy which, with the later disappearance of those transitory resources, became financially unsustainable for the government. This was the basis of the future chronic fiscal and inflationary difficulties in Argentina.

On account of the high discrimination against exportables and in favor of importables, the trade share of the economy became quite small. Exports reached very low levels, representing less than 10 percent of GNP, agricultural production stagnated, and strong import substitution industrialization (ISI) took place. Such reduction in international trade, coupled with fiscal and price stability problems, retarded Argentina's rate of growth. This

delay had two stages. A weak one in the first 30 years after the war (1945-1975), in which per capita annual rate of growth was only 1.0 percent, and a strong one in the next 30 years (1976-2005), in which per capita growth was nil.

Mainly on account of fiscal deficits and price instability, the real exchange rate (RER) became very volatile (Figure 1). Up to the 1990s such volatility manifested both in the short and in the medium term. There was a strong real appreciation of the peso at the end of the 1970s and beginning of the 1980s. After 1990, while real short term volatility reduced, medium term volatility increased. In the period 1991-2001 there was a strong real appreciation of the local currency. After the great nominal devaluation of the peso in 2002 (more than 200 percent), the Argentine currency in the last five years is showing a strong real depreciation. That short and medium term volatility in the RER had a decisive impact on the level of direct assistance on Argentine agriculture. As we will show later, such assistance was strongly correlated with the observed values of the RER.

Before 1990, short term volatility of the RER generally reflected recurrent crisis in the balance of payments. With any expansion of economic activity, imports increased, industrial exports decreased, and so the current account of the balance of payments got into a deficit situation. As inflows of foreign capital were scarce, foreign reserves depleted and a balance of payment crisis developed. This was followed by a devaluation of the currency, a recessionary process¹ and, eventually, a correction in the current account deficit. This period of strong short term economic and RER volatility was known as the “stop-go economy”.

In 1991, with the intention of overcoming the stop-go process and of re-establishing price stability in the economy, deep changes in economic policy were introduced under what was called *the convertibility program*. A currency board monetary scheme was established, fixing a 1 to 1 nominal relation between the peso and the dollar. Under this scheme money expansion and contraction became completely endogenous, and the Central Bank was prohibited to create money to finance the public sector.

Together with such macroeconomic scheme, important structural reforms were introduced. A very complete program of privatization of public enterprises was implemented. Ambitious deregulation legislation was approved which applied both to private and to public activities. Important changes were made in social security, introducing a private capitalization system. Finally, there was a strong impulse to reduce the anti trade bias in previous external commercial policies, eliminating all export taxes and quantitative restrictions, and reducing tariff barriers to imports.

¹ Devaluations were usually combined with restrictive monetary and fiscal policies.

Specifically in relation to agriculture, elimination of quantitative restrictions, reductions on tariffs for fertilizers, herbicides, pesticides, machinery and irrigation equipment, elimination of distorting taxes in fuels, commercial and financial transactions and removal of inefficiencies and monopoly profits in the trade channels (elevators, transportation and ports), all this together with the elimination of export taxes and the deregulation of economic activities, gave significant impulses to agricultural growth (see World Bank 2006), and during the first years of convertibility such changes were able to overcome the reduction in agricultural incentives associated with the real appreciation of the peso that took place during convertibility.

In its early years, the convertibility program triggered an increase in external confidence in the economy and saw large inflows of foreign savings, which allowed for strong growth in the economy, but which also resulted, as it was mentioned, in a visible and growing real appreciation of the local currency (see, Figure 1).

The convertibility program, after a long and deep recessionary process that started in July 1998, ended with an unprecedented political and economic collapse at the end of 2001. The combination of an overvalued peso, with a recession and an unsustainable dynamic of both Argentinean external and public debt, plunged the country into a massive outflow of capital, resulting in a devaluation of more than 200 percent and a deep default in both external and public debts.

Fortunately, after the collapse, the economy had in the last four years (2003-2006) a very strong and, in some sense, unexpected recovery. A new macroeconomic scheme was introduced which combines very large and permanent fiscal primary surplus, a slightly expansionary monetary policy, a restructuring of the public debt, and a strong intervention of the Central Bank in the foreign exchange market in order to accumulate international monetary reserves and to sustain a clear real depreciation of the peso. This scheme has allowed economic agents, consumers and domestic and foreign investors, to recuperate confidence in the economy. GNP has grown in those four years 40.5 per cent, unemployment has reduced since 2002 from a level of 24 percent to a present one of less than 10 percent, and social indicators of poverty and indigence are strongly improving

The agricultural sector

The contribution of the agricultural sector to the Argentine economy is very important. In 2004 it generated 9 percent of national GDP, and 22 percent of the value added of the goods sector. It contributed almost 60 percent of total goods exported, of which around 40 percent are primary products and around 60 percent are processed agricultural products. Agriculture is also an important source of employment. Data for 1997 indicates that direct agricultural employment was about 1.5 million or 11.4 percent of total employment (World Bank 2006).

When describing the Argentine agricultural sector, it has been usual to consider two differentiated productions: *pampean* and *regional*. The first essentially including grain crops and cattle raising to produce beef and milk. The second including different regions and products: fruits and sheep raising in the Patagonia, grapes and other fruits in Mendoza and San Juan provinces, tobacco leaf, sugar cane, and citrus in the Northwest, cotton, tea, *maté* herb in the Northeast.

Such regional splitting between two kinds of productions is rapidly losing ground mainly on account of the rapid expansion of soybean crops in the northwest and northeast regions. But there are still some important differences. First, while *pampean* production is equipment and management intensive, and land and labor extensive, *regional* production is less intensive in management and capital (with the exception of irrigation development), but more land intensive, and especially labor intensive. Employment of labor per hectare, and per unit value added, in regional productions, is several times that of the *pampean* production. Second, size of farms in hectares, with the exception of the Patagonia region, is much larger in the pampas. In non-*pampean* productions a high proportion of farms have a scale well below what is advisable for adequate technological and economic development. Third, rural poverty is concentrated in regional agriculture. There are 200,000 indigent poor families in rural Argentina who live largely in the Northeast and the Northwest. Rural poverty alleviation in Argentina relies on the future performance of regional agricultural economies (World Bank 2006).

The six main primary productions of Argentine agriculture in 2005, in order of importance, are: soybean, cattle-raising, raw milk, corn, wheat, and sunflower. In current prices they represent a 73.4 percent of total value of agriculture production (this total value estimated in agreement with the project's methodology (Anderson et al. 2006). Those are the six primary products we selected to measure distortions in Argentine agriculture.

Considering such six products, the evolution of agriculture along the period that we are studying (1960-2005), is shown in Figure 2. Agricultural pricing policies, technological advances, new forms of farm organization, and the impacts of economic policies of the early

1990s, have been the main determinants of such evolution. The rate of growth of grain crops has been much larger than that of livestock. While crops increased almost 300 percent in the period, livestock only increase around 50 percent. The principal reason of this strong relative stagnation of cattle-raising has been a significant lower rate of technological improvements in livestock production. This lower rate, on one side directly explains the poor relative performance in relation to grain production, and on the other side it explains why pastures were abandoned to allow more land to be used for crops.

With respect to grain production, two periods can be identified. The first one from 1960 to 1990, when production doubled. This relative low growth (relative with respect to other countries such as Chile and Brazil, and with respect to the next period), did not originate from better real crop prices, but by the introduction of technical improvements (intensification in the use of machinery and equipment, hybrid seeds in corn and sunflower, and others) that allowed for increases in yields. Expansion of the crop frontier outside the pampas and intensification of land use in the pampas were not very significant drivers of growth in this period. The second period refers to the last 15 years (1990-2005), when crop production also doubled but in only half the time. This strong acceleration in the rate of growth of grain production (World Bank 2006), was on account of five main factors:

1. Expansion of the crop frontier, mainly in the Northeast and Northwest, where soybean is the main component of it. It is estimated that around 120,000 hectares were incorporated into agriculture each year in those two regions (World Bank 2006).
2. Intensification of land use in the pampas derived from shortening of rotations associated with more use of fertilizers and the zero tillage planting technique, and elimination of pastures as livestock production was displaced towards more marginal land.
3. Several important innovations that allowed for a strong rise in yields per hectare, such as, the introduction of RR (resistant to round up herbicide) soybean, the BT corn seed, and other biotechnology advances. Also, the development and massive spread of Zero Tillage (labranza cero), which also allowed for increase in yields and for reduction in costs of production.
4. The introduction, mainly in the pampas, of important new forms of farm organization in agricultural production. The most significant one has been the appearance of planting pools (pools de siembra). These pools joint investors who finance grain production. Each pool makes rent contracts with a large number of landowners, generally located in different regions in order to diversify risks, and assume the management of the crop production enterprise. With these kind of production arrangements the use of land is decided by large

scale highly specialized management, with the best professional advice. While planting pools have a national scope, at the local or regional levels, a similar kind of arrangement is that of contractors who also rent land to produce grains. Contractors are also specialized entrepreneurs with an efficient scale of production. With all these type of arrangements the use of land in the pampas is today very efficient, and very independent of the entrepreneurial characteristics of the landowners.

5. As mentioned, an important economic policy reform was introduced in the early 1990s. Although there was a significant and increasing real appreciation of the currency along this period, which through high prices of non tradables reduced agricultural incentives, the policy reform favored Argentine agriculture through the following ways (see World Bank 2006):

- 1) Export taxes were eliminated.
- 2) Protection on non-agricultural importables was reduced because of lower tariffs and of elimination of quantitative restrictions to import. Specifically, agriculture benefited from reductions in both tariff and non-tariff protection on fertilizers, herbicides, pesticides, machinery, and irrigation equipment. Fertilizer use increased five fold, and herbicide and pesticide uses increased three fold in the period.
- 3) The deregulation of private economic activities, mainly commercial and financial, allowed for reductions in agricultural trading and financial costs and removed inefficiencies and monopoly profits in the trade channels (elevators, transportation and ports).

Together with landowners, contractors and planting pools, there are other important actors in the Argentine agriculture value chain. One group of actors is the providers of agricultural inputs. Seeds, as genetically modified (GM) soybean and corn, corn and sunflower hybrids, and other seeds, are decisive inputs in grain production. They are provided by highly specialized national and international firms (Cargill, Dreyfus, Monsanto, etc.), which have incorporated frontier advances in biotechnology research and development. More or less the same happens with the provision of agricultural equipment, fertilizers and agrochemicals. Going to the trading point of the value chain, there is an efficient group of intermediaries attending storage, handling, drying, commercialization and transportation.

Another group of actors in the agro-industrial value chain are the light processors of primary production. We can find them dispersed all over the regions where there are significant levels of production; slaughterhouses and refrigeration plants for producing beef,

crushing mills for processing soybean and sunflower grains, and dairy plants for processing milk. As it was mentioned, and although there are in some cases problems of insufficient scale, efficiency in processing is quite high.

The final group is associated with the commercial distribution point of the value chain. Beef, dairy products, those derived from the processing of wheat, and vegetable oils, are the main products derived from pampean primary production which reach the consumers through efficient channels of distribution.

In all points of the value chain there prevails strong competition between firms. Perhaps, only in the processing stage, for example in sunflower processing, it is possible to find some collusive behaviors, but within narrow limits.

The methodological and measurement context

The project methodology

The basic conceptual and measurement context of this paper is the project methodology (Anderson et al. 2006). In this respect, we will only consider as distortions those that have their origin in economic policy decisions. In this sense, the focus is to study those economic policies that affect observed agricultural prices, or more specifically, distortions that separate the observed relative agricultural prices (of products and inputs) from the opportunity (or social) relative prices that would have prevailed in the absence of such distortions. As the main interest is related to tradable products, the principal distortions to be measured are those associated to trade policy, i.e. tariffs on imports, taxes or subsidies on exports, non-tariff barriers to trade, state marketing boards for tradable products, and other trade pricing policies. In any case, domestic taxes or subsidies are not excluded.

There are some, more indirect or economy wide distortions that may affect agricultural relative prices or incentives that will not be measured. The three more important ones are:

- Possible macroeconomic misalignments in the RER. Anyway, the existence of multiple exchange rates within tradables will be considered.

- Distortions on the service sector, or more generally, on non tradables. It is recognized that distortions in these sectors can be very important for agriculture, but difficult to measure within the reach of this project.

- The non optimal provision of public goods which are considered important for agriculture (infrastructure, research and extension, phytosanitary protection, food safety, and other), are also difficult to measure within the scope of the project.

In any case, some economy wide distortion will be measured. Particularly, those related to trade policies associated with the non-agricultural tradable sector of the economy, would be computed. Specifically, the indicators that will be estimated are the following:

- Nominal rates of assistance (NRA_f) of primary agricultural products at the farm level.
- Nominal rate of assistance (NRA_p) of lightly processed agricultural products at the processing level.
- Direct rate of assistance (DRA_f) of primary agricultural products at the farm level. This indicator, will include price distortions that come through intermediate inputs of agricultural production, and consequently gets closer to effective assistance measures.
- Direct rate of assistance (DRA_p) of lightly processed foods at the processing level, with the same implications than the previous one.
- Direct rate of assistance (DRA_A) for agriculture as a whole
- Direct rate of assistance (DRA_N) for non-agricultural as a whole.
- Total rate of assistance (TRA_A) for agriculture as a whole including the impact of direct assistance on the non-agricultural sector.
- Relative Assistance Index (RAIf) for primary agriculture within tradables.
- Anti-trade Bias Index (ABI) within agriculture.

Also, for agricultural products and lightly processed food products, a consumer tax equivalent (CTE) will be computed which will be equal to the nominal rate of assistance (NRA) for those products.

Two previous studies

Two preceding studies are very important for our paper because they will provide computations of the NRAs for the first 33 years (1960-1993) of our period for five of our six selected agricultural products.

The chapter for Argentina in the KSV study

In the period 1985-1987, the World Bank, under the direction of Anne O. Krueger, Maurice Schiff and Alberto Valdes, promoted the study *The Political Economy of Agricultural Pricing Policy* (Krueger, Schiff and Valdes, 1991), including 18 country cases. This research is well known internationally as the KSV study. The chapter on Argentina, "Trade, Exchange Rate, and Agricultural Pricing Policies in Argentina", was prepared by Adolfo C. Sturzenegger, with the collaboration of Wylían Otrera and the assistance of Beatriz Mosquera (Sturzenegger et. al. 1990).

The main purpose of that chapter was to measure agricultural distortions in Argentina for the period 1960-1985, and to find a political economy explanation for the existence of such distortions. The products selected, all tradables and exportables, were wheat, corn, sorghum, soybean, sunflower and beef. The first five, primary products, and beef as a lightly processed one. In the case of soybean and sunflower, the period covered was 1976-1985 because of non availability of good data before 1976. Both direct and indirect intervention in agriculture, were measured. Nominal direct protection rates (NPR_D) were measured at the farm level through comparisons between prices with intervention (observed prices) and without intervention (opportunity prices).

The chapter elaborated carefully the measurement of indirect intervention. This economy wide distortion had two components in the study. Firstly, nominal direct protection on industrial production, measured through a combination of price comparisons (domestic with international prices), and explicit tariffs. Secondly, the impact of economy wide misalignments in the RER on relative prices between tradables and non tradables. These misalignments were measured through comparisons between the observed RER, e , and the "long run equilibrium free trade" RER, e^* . This last rate was estimated through three type of adjustments performed on the observed RER, e : 1. to eliminate disequilibrium effects associated with temporary short term factors (the "long run" adjustment); 2. to correct for the differences between observed and sustainable trade balances (the "equilibrium" adjustment); and 3. to correct for the impact on the observed RER of external trade policy (the "free trade" adjustment).

The measurements of the two components of indirect intervention allowed estimating a price of the non agricultural sector including non tradables, and prices for the selected products free from indirect intervention. These calculations give us nominal indirect protection rates (NPR_I) for each selected agricultural product. Finally, adding direct and indirect distortions, nominal total protection rates (NPR_T) for each selected product were obtained. Total effective protection rates (EPR_T) were also estimated for each product, but in this case only total effects were computed, without distinguishing between direct and indirect effects.

The main results obtained were the following:

- High (in absolute values) negative rates of *total* protection, for all the selected products, without any significant trend and very low dispersion.
- High (in absolute values) negative rates of *direct* protection, also for all products and with high dispersion.
- High (in absolute values) negative rates of *indirect* protection, also with high dispersion.
- A significant inverse correlation between contemporaneous *direct* and *indirect* rates of protection.

The principal explanation of this inverse correlation was that direct nominal disprotection rates changed in a way that compensated changes that came through indirect nominal disprotection, mainly through misalignments in the observed RER.

The chapter for Argentina in the Surveillance study

In 1994 the World Bank financed another research on trade distortions in agriculture, *Surveillance of Agricultural Price and Trade Policies*, prepared by Alberto Valdés and Barry Schaeffer (Valdés and Schaeffer 1995) for 8 Latin American countries. The *Handbook for Argentina* which was prepared by Valdés and Schaeffer, with the collaboration of Adolfo Sturzenegger and Ricardo Bebczuk, was actually a continuation of the Argentine chapter in the KSV study.

The products selected were seven. The same six included in Sturzenegger et al. (1990) and cotton. The period studied was 1985-1993. Four policy indicators for each product were estimated in the *Handbook*: Nominal Protection Rate (NPR), Effective Protection Rate (EPR), Effective Rate of Assistance (ERA), and Producer Subsidy Equivalent (PSE). Indirect distortions were not computed. The first of the four indicators is the more relevant for our research, and so we will focus on it.

The measures of NPR were calculated using as "observed" prices those calculated through explicit export taxes, and as prices without intervention FOB prices corrected by port (border) costs. NPR rates were estimated both at wholesale points and at farm points. As a consequence of the existence of fixed trading costs, ad valorem rates were larger (in absolute values) at the farm level.

Indicators were calculated for each selected product, and for the aggregation of the seven products. The main results of interest are the following:

- High (in absolute values) negative direct protection is obtained for the period 1985-1990, mainly for 1989-1990 when the observed RER was strongly depreciated.
- On the contrary, since 1991 negative protection reduced substantially, becoming positive for some products in 1993 when the RER was already showing an apparent appreciation.
- As it can be observed, it appeared the same profile of relations between the observed RER and export taxes that it was found in the K/S/V study.

The products selected

In the case of Argentine agriculture, the selection of the products for which the assistance indicators should be estimated is almost predetermined, because six primary agricultural productions are dominant. As it was mentioned in the previous section they are: soybean, cattle-raising, raw milk, corn, wheat and sunflower. So, this is our selection for primary agricultural products.

In 2005 they represented in current prices 73 and 73.6 percent, and in constant prices of 1993, 73.4 and 72.9 percent, of total gross value of agricultural production² and of total gross value added of agriculture, respectively. Four of them, i.e. wheat, corn, soybean and sunflower are exportable goods. The situation is different with respect to the other two primary products: raw milk and live cattle. The inherent trading conditions of these products is that both are non tradable, in the sense that transport costs per unit of value are high enough to make exports (or imports) quite unfeasible. But with light processing, they transform into strong exportables. Under this condition their prices are not equilibrium results

² In accordance with the project methodology, total agriculture excludes tobacco leaf, fruit and vegetables, forestry, hunting and agricultural services. Also, the methodology suggests a representation of around 70 percent.

of domestic supply and demand, but like full tradable products, they depend on border conditions (fob prices, etc.) of the associated processed goods. Being inherently non tradables, their prices behave, although indirectly, as those of tradable products, and so, for the measurement of their distortions they will be treated as non traded exportables. Anyway, for raw milk, as exports of dairy products were very low before 1989, and its price depended only on domestic conditions, before that year it will be considered as non tradable.

With respect to light processed foods we have selected four products. To measure distortions on cattle, we chose beef, as it is obvious. For doing it in the case of raw milk, we chose powder milk, as its exports today represent 77 percent of total exports of dairy products.

The other two light processed products are pellets, the largest soybean byproduct, and sunflower vegetable oil the largest sunflower byproduct. It is important to mention that including these two products does not imply any improvement in the measurement of distortions on primary agriculture because for soybean and sunflower grains we have already measured distortions directly. The reason for incorporating these two processed products is their importance in terms of exports and of values of production within the group of light processed food goods in Argentina.

We searched the possibility of selecting some important agricultural importables, especially in order to have better measures of the antitrade bias within agricultural tradables. In the cases of sugar cane and processed sugar and cotton and cotton fiber in Argentina, with the exception of two or three years along the period analyzed, they were exportables or non tradables. Paddy and processed rice, wool, other animal products, other grains as barley, rye, oats millet are also mainly exportable or non tradables products.

Time period coverage

In agreement with the project methodology the period covered in this study is 1960-2005, although there are some exceptions for some products. In relation to the six primary products, for the cases of soybean and sunflower the measurement will start in 1976. As it is commented in Sturzenegger et al. 1990, production of these two oilseeds was low before that date and getting information on them was not easy. With respect to the four light processed products, for the cases of byproducts of soybean and sunflower grains, the period will cover

only the last 12 years, i.e. 1994-2005. As it was commented above, measurement of distortions for these two products does not improve such measurement related to primary agriculture, and so reaching back to 1960 is not justified.

Measures and results

Direct assistance

Nominal Rate of Assistance

As it was already mentioned, of our six selected agricultural primary products, five of them – wheat, corn, cattle, soybean and sunflower were included in the two previous studies, Sturzenegger et. al. 1990 and Valdés and Schaeffer 1995. For the periods analyzed in these studies, and for those five products, we have used their results as our computations of the NRAs, and their data for the computation of the NRAs.

In Sturzenegger et. al., the NRAs for those five primary products were calculated for the period 1960-1985. They were named Direct Nominal Rates of Protection (NPR_d). The method used was price comparisons at the farm level using the simple same equation suggested in the project methodology, i.e. $NRA_f = (P_f^d - P_f^u) / P_f^u$, where P_f^d is the distorted or observed domestic price at the farm, and P_f^u is the undistorted, or opportunity, price also measured at the farm. For the four grains P_f^d was equal to the wholesale price at the Board of Grains minus the trading costs (T_f) between the farm and such wholesale market. P_f^u was equal to the dollar FOB price in Argentine ports minus export and port costs also measured in dollars. This value in dollars was multiplied by the nominal Rate of Exchange (E) and subtracting T_f , P_f^u was obtained. For cattle P_f^d was directly measured, while P_f^u was equal to the FOB price of beef minus export and port costs. This value was multiplied by E, and subtracting processing costs (m_p) and a discount factor for reaching from the wholesale point (Liniers market) to the farm point, P_f^u was obtained.

Although the above equation appears simple, the measurement of some of its components presented some difficulties. In relation to both P_f^d and P_f^u , for the four grains, harvest prices were taken: January prices for wheat, and May prices for the other grains, corn, soybean and sunflower. The reason for this decision was that for the period studied (1960-1985), producers sold most of the grain collected quite soon after harvest time. This reason resulted strengthened when taking into consideration the very high rate of inflation that

prevailed in most of that period. Now, such decision has probably introduced in the measurement a non-distortionary price wedge, the one associated with a stronger bargaining power of traders in harvest time. Such price wedge is not a policy induced one, and in this sense there probably exist some degree of upward bias in the absolute values of negative assistance that we are reporting for that period. In the case of cattle, as seasonality in production is weak, the previous study used yearly averages for both P_r^d and P_r^u .

A second major difficulty is related to the measurement of P_r^u , specifically with the value of E , the nominal rate of exchange. As it was commented in the previous section, in Sturzenegger et. al. 1990 there is an elaborate estimation of economy wide misalignments in the real exchange rate. In that study such measures of misalignments were not used when estimating direct protection. They were only used when estimating the impact on agriculture incentives of indirect distortions. However, the approach of the project methodology used in this paper is different. First, economy wide policies (fiscal, monetary, foreign investment and aid, and others) that could misaligned the RER should not be considered. Only should be considered explicit government interventions in the domestic market for foreign currency aimed directly at altering relative prices among tradables. Second, if effectively the exchange rate system is distorting prices within tradables, its impact should be included in the measurement of direct indicators of assistance. Given these differences, a brief review of the Argentine exchange rate system for the period 1960-1985 is needed in order to see how the measurement of the NRAs in Sturzenegger et. al. 1990 reconcile with the project methodology.

For the first eleven years of our period, 1960-1970, there are not exchange rate measurement problems. Although the foreign exchange market had dual rates –commercial and financial–, both rates had almost the same value, and the commercial one was a unified market with equal rates both for exports and imports. There existed also a parallel market but with rates quite close to the two official markets. The situation is less clear during the seventies. In September 1971, in the official exchange market appeared a large difference of more than 50 per cent between commercial and financial rates. Simultaneously, retention schemes were introduced both on exports and imports: exporters were allowed to sell a large proportion of foreign exchange in the financial market, while importers had to buy the same proportion in that market. The effective exchange rates were the same for exports and for imports. These rates were correctly computed in Sturzenegger et. al. 1990 for the period 1971-1974. Although existed a parallel market with a somewhat more depreciated peso rate (around 20 per cent), and the effective exchange rate for non traditional exports was

somewhat more depreciated than that for the other tradables, we decided not to introduce changes in the previous measurements. During 1975 the peso experienced very strong devaluations in both the commercial and financial official exchange markets, while in the parallel market the depreciation of the peso was more than 100 per cent larger than in the official markets. Anyway, as commercially there existed a unified rate of exchange for almost all tradables, and as the value of the parallel market was inconsequential for determining relative incentives between tradables, again we decided not to introduce any change.

During the first 10 months of 1976 it is clear that a commercial multiple-tier exchange rate system was in force in Argentina, with different rates for different exports and imports. This type of exchange distortion was not captured by the previous study, as the used rate of exchange for that period was simple the agricultural exports rate. Some correction would be justified, but the measurement of such multiple-tier exchange rates resulted difficult to do. In November 1976 a unified official exchange market was reestablished, and this situation lasted up to 1980. Although for some years in this period, a parallel peso rate appeared as more depreciated than the official rate, not any correction was introduced. In 1981 there is a collapse in the exchange system with strong devaluation of the peso, and a dual exchange system –commercial and financial- is reestablished. Anyway, there are not different commercial rates within tradables. In December of this year a unified official exchange market is reintroduced.

In the period 1982-1987, there are, alternatively, unique or dual official exchange rate systems, but in all cases there were not differences between rates of exchange for exports and for imports. In 1988, the hyperinflationary year, it seems that for the second half of the year, there was a multiple-tier commercial exchange system, but it is very difficult to measure the differences of effective rates within tradables. Since 1990 a unified official exchange market prevails in Argentina.

In summary, in spite of the differences between the two previous studies and the project methodology for the measurement of foreign exchange distortions, we decided not to introduce corrections for the computations of the NRAs, on account of the following four reasons:

- The differences between official and parallel rates were not considered relevant for the measurement of relative incentives within tradables.
- For almost all the period there was not rate of exchange differences in the official market between exports and imports.

- When the existence of such differences was detected, it was difficult to measure them.
- When retention schemes were in force, the previous studies adequately measured the exchange impacts of such schemes.

The second previous study, Valdés and Schaeffer 1995, computed the NRAs and the NRAs for the five overlapping products for the period 1986-1993, and we used these results in our work. To estimate those indicators of assistance to agriculture, this second study applied an explicit tariff method instead of direct price comparisons. To calculate P_w^d (and also P_f^d), instead of utilizing wholesale prices at the Board of Grains, it used the formulae $P_w^d = P^u (1 - s_x)$, being s_x the ad valorem export tax (negative export subsidy). In Argentina the overwhelming direct price policy distortion in agriculture is export taxation. For our four primary exportables below, when we will comment on the results, we incorporate comparisons between both methods of measurement of agricultural assistance, i.e. using direct price comparisons or using explicit export taxes. As we will see, results of both methods are quite similar, being this the main justification for using Valdés and Schaeffer measures.

For the period 1994-2005 we elaborated our own estimates of NRAs and of NRAs. For the four exportable primary grains direct price comparisons were used, T_f was assumed independent of P_w^d , and so θ_f , the transmission factor from wholesale point to farm point, had values larger than one. The assumption of constant T_f seems adequate in Argentina, because as mentioned, exist high efficiency and competition in trading activities for the major exportable grains. In the case of live cattle, distortions on processed beef were used. As it was difficult to get a good series for wholesale prices of processed beef, explicit export taxes were utilized to estimate this series. In order to go from prices of processed beef to wholesale (Liniers market) prices of live cattle, regression analysis was applied to estimate a transmission factor θ of 0.99. In order to go from wholesale point (Liniers) to the farm point, a guesstimate of θ_f of one was adopted.

Our sixth primary product is raw milk. Here we could not count on previous results. Defining the trade status of this product was not difficult. Up to 1988 it was a pure non tradable. Exports of dairy products were low and we could not find any relation between export prices of dairy products and raw milk prices. After that year, the value of exports of powder milk, the associated processed product selected to measure distortions on raw milk, started to be more significant and in the last years were generally larger than 10 per cent of value of production of milk. Also, regression analysis showed significant relations between

export and primary prices. So, for the period 1989-2005, raw milk was defined as a non traded exportable. Just as the case of beef, a good series of wholesale prices of the processed product was not available and so, again in this case, explicit export taxes were used to estimate this series. Regression analysis allowed estimate a θ of 0.95 for the period 1994-2005, and a θ of 0.35 for the period 1989-1993. The guesstimate for θ_r was one. The guesstimate of assistance for raw milk for its period of a pure non tradable was zero.

In the case of pellets (soybean byproduct) and sunflower vegetable oil (sunflower byproduct), the NRA_p were straightforwardly estimated through price comparisons between fob prices net of export costs and FAS prices at the wholesale Board of Grains which were obtained using the explicit tariff method. In these cases there were not used any transmission factor because NRA_r for soybean and sunflower grains were already calculated. Also the period covered was only 1994-2005 as measures of assistance on these two processed byproducts are not relevant for determining measures of assistance on primary agriculture.

Consumer Tax Equivalent

The project methodology suggests compute a Consumer Tax Equivalent (CTE) for each of the selected products, both primary and lightly processed, including a guesstimate of the CTE for the rest of primary agriculture and lightly processed "agriculture". Also an average for all "agriculture" (primary and lightly processed) has to be estimated.

The methodology suggests taking the value of the corresponding NRAs as the value of the CTEs. This indication is assuming that prices for final consumption goods will change in the same proportion that is changing the price of primary agriculture (or processed) inputs. As it is commented in the paper for the Chilean case (Valdés and Jara 2006), this assumption may lead to an overestimation in the value of the CTE, as very probably not all prices of other inputs needed to provide the final consumption of the product, will change in proportion with the price of the agricultural (or processed) input. So ad valorem CTE rates reported in this paper should be taken with great precaution.

Given the assumption adopted by the methodology, it is understood that, if possible, the guestimates of the CTE for the rest of "agriculture" should be related to NRAs guesstimates.

In the case of Argentine agriculture, of the six primary products selected, only raw milk is consumed as it is. Final consumption of the other five takes place only after processing. With respect to our four lightly processed food products, beef, sunflower oil and powder milk are consumed by households.

Direct Rate of Assistance

The project methodology indicates that after estimating the NRAs, Direct Rates of Assistance (DRA) should be estimated. These rates mean an adjustment of the value of the NRA in order to compute the effects on effective incentives that come through distortions on inputs. In this paper, the scope of the inputs included to compute the DRAs is restricted to those integrating the direct production function of each agricultural activity. So, distortions on more indirect inputs as credit, out of farm transport and trading services, availability of infrastructure, research and extension and others, are not included. Aside from clear measurement difficulties, another reason for such exclusion is their relative lower importance for agricultural incentives in Argentina.

So, for the six primary products, the way from the NRA_f to the DRA_f was computing distortions on intermediate inputs directly used in primary production, taking only tradable ones, and within this group, only the most important ones. Those taken were: fertilizers, herbicides and pesticides, machinery, and combustible. For each of these inputs only trade policy distortions were computed, mainly tariffs on imports. Seed is also an important direct intermediate input for grain production. In the case of sunflower and corn, hybrid seeds were used in the second half of our period, and when used we decided to treat them as non tradable inputs, consequently not computing any distortion. The situation of wheat and soybean is different. In relation to these two crops, the own harvested grain can be used as seed for the next crop. Although in Argentine agriculture, new seeds are produced each year in highly specialized firms, these seeds are used in a low proportion, only 20 percent of all the seed planted. Then we decided in the case of wheat and soybean to consider seed as a tradable input. In the case of raw milk, DRAs indicators were computed only for the period when this product was defined a non traded exportable.

The measurement of the DRAs presented differences with respect to our four processed products: powder milk, beef, pellets and sunflower oil. In all these cases, the only input considered was the associated primary product: raw milk, cattle, soybean grain and sunflower grain, and the only distortion considered in such input was the computed NRA for each of these four primary products.

Aggregated Direct Rate of Assistance for primary selected products

The primary agricultural products for which we have computed DRA_f are: wheat, corn, soybean, sunflower, cattle and raw milk. In the template, the first four are included as

exportables, and the last two as non traded exportables. We should remember here that while these two products are non traded, their prices behave as those of exportables.

Estimating weights related to gross values of production at undistorted prices of each product, an aggregated indicator for all the selected products was computed, remembering that they represent 73.4 percent of total primary agriculture as it is defined in the project methodology.

Direct Rate of Assistance for all agriculture

This estimation tries to compute DRA_A , i.e. a computation of assistance to all primary agricultural products. What is needed is to add to the aggregated measure of assistance indicated above for the selected products, a guesstimate of assistance to the rest of agriculture, i.e. to the 26.6 percent of non selected products.

Some of the products in this rest of agriculture are: paddy rice, several coarse grains, sugar cane, live animals excluding cattle, raw cotton and raw wool. We classified them in exportables like sorghum, barley, or millet, and in non traded exportables as paddy rice, sugar cane, wool or cotton. We decided the guesstimates for these products following the criterion of applying approximately the same level of assistance estimated for similar products within the group of our six primary products. In this sense for the exportable group of products within the rest of agriculture, for instance for sorghum, we used the rate of assistance estimated for corn, and for the non traded exportable group that estimated for raw milk or cattle.

A last point is the following. The project methodology indicates that if there is significant non product specific assistance to agriculture, then they should be considered when measuring the DRA_A . In Argentina, as it was mentioned, there is some non product specific assistance as financial support or the cases of INTA and SENASA, that might have been considered, but the amounts were not important in relation to the agricultural PBI.

Indirect assistance

As it was indicated, the project methodology requires estimate the indirect assistance to agriculture that may come through assistance to the rest of the economy.

The project methodology suggests a grouping of non agriculture in five sectors: Food Processors I (lightly processed food products), Food Processors II (highly processed food products), Non agricultural Primary Products, Non Food Manufactures, and Services. For

each sector it is suggested an additional grouping in three subsectors: importables, exportables, and nontradables.

In relation to the first sector, lightly processed food products, we must remember that four products were selected in our work for estimating distortions to incentives: powder milk, beef, soybean pellets and sunflower oil. Considering powder milk (the largest exporter of dairy products) as representative of all dairy production, soybean pellets (weighting more than 60 percent) as representative of all soybean byproducts, and sunflower oil (the most important sunflower byproduct) as representative of all sunflower byproducts, our four selected lightly processed represented in 2005 more than 80.0 percent of total lightly processed production³. In the past this percentage was clearly lower.

The estimation of distortions for our four selected processed products, started with the estimation of the corresponding NRA_p . In the cases of pellets and sunflower oil the method of price comparisons was used. Argentine fob prices net of export costs were compared with FAS prices at the wholesale Board of Grains. In the cases of beef and powder milk, as FAS prices were not available, we used explicit export tax method to estimate them.

The next step was going from the NRA_p s to the DRA_p s. As all these products have a light processing, the only distorted input that was taken into account for the estimation of the DRA_p s was the associated primary product. As, in general, all these products were highly disprotected, the byproducts usually denoted positive DRA_p s.

For the rest of this sector, all exportables in the Argentine case, as other meats products, processed rice and processed sugar, the project methodology suggests using a guesstimate of import tariffs, or export subsidies, taking also account of non tariff barriers⁴. In our estimations we use as guesstimate the NRA_p s on the processed products that we specifically measured.

Combining the DRA_p s obtained for the four products with the guesstimate DRA_p s for the rest of the lightly processed food sector, the DRA_X s for exportables and the DRA_{NT} s for non tradables⁵ are computed. Finally, it is obtained the DRA for the lightly processed food sector.

The next sector to consider was Food Processor II, i.e. highly processed foods. All of this sector was defined as exportable. The DRA guesstimates were calculated in two stages. In

³ This total is defined for all the products that the project methodology defines, in Table 6, as lightly processed foods. There was not possible to have enough segregation in the data to know how representative of that total are our four selected products considered alone.

⁴ This suggestion refers not only to the sector we are considering, but also to the remaining tradable sectors. We will make some comments on this question when we consider below the Non Food Manufactures sector.

⁵ Powder milk was defined as non tradable between 1960 and 1989. There were no importables in this sector.

the first, for the period 1960-1975, we used Berlinski and Schydrowsky 1982 study both for exportables and for importables for the year 1969. In the second, for the rest of the period, we used information of Guía Práctica of explicit export taxes and export reimbursements.

The next sector to analyze is Non Agricultural Primary products. It was difficult to get good information to define the trade status of this sector for the first 35 years of the period. Since 1994 it is clear that the sector is an exportable one. In 2006 exports of copper mineral will be larger than beef exports. The DRA guesstimates for this exportable period were obtained from Guía Práctica taking account of explicit export taxes and export reimbursements.

The next sector is Non Food Manufactures. The high protection to the importable component of this sector is the main responsible of indirect pricing policies against the Argentine agricultural sector. We already commented about the strong ISI policies that Argentina applied immediately after the II World War. In Macario 1964 we can compare for four countries the levels of import duties and other import charges legally applicable at the beginning of 1960 expressed in ad valorem terms as percentages of the c.i.f. value. The simple arithmetic means of those duties and charges were: Argentina 151 per cent, Brazil 60 per cent, Chile 93 per cent and France 18 per cent.

Now, import duties were not the only trade and pricing policy instrument used to assist the importable component of non food manufacture sector. Several other instruments were in force: official customs valuation, advanced deposits on imports, quantitative restrictions on imports as quotas and prohibitions, special import regimes which in general implied exemptions of duties, and regional preferential tariffs. In order to further complicate any attempt to measure the real protection, many tariffs were or become prohibitive, generating situations of tariff redundancy. Actually, on account of redundancy and exemption regimes, implicit or real tariffs may be lower than explicit or legal ones, while on account of quantitative restrictions and advanced deposits, the situation may be in the opposite way. This complicated measurement situation was very serious during the first three decades of our period. At present the situation is much simpler: water in the tariff situations, quantitative restrictions, advance deposits and special regimes, have decidedly lost their importance. Today importable industry protection is overwhelmingly driven by legal tariffs somewhat corrected by preferential tariffs associated with FTAs.

How to undertake the measurement for those three first decades? A first possibility is to resort to the previous study Sturzenegger et. al. 1990. Indirect assistance for the period 1960-1985 was studied in this work. It had two components: those associated with economy

wide misalignments of the RER, as it was already commented, and those associated with nominal protection to manufacture that we need for our own estimations. To measure this protection such work took Berlinski and Schydrowsky 1982 results for year 1969 of the aggregate implicit tariff for all manufacture in Argentina and then, using that year as base, obtained values for the other years changing that base value using yearly changes in wholesale manufacture relative prices. We have analyzed the results obtained in such work, and we did not find them satisfactory.

In front of the situation we decided to define the guesstimate for importable non food manufacture, in the following way. Basically, we used three of the many Berlinski's researches on Argentine import trade policies, i.e. Berlinski 2002, Berlinski and Schydrowsky 1982 and Berlinski 1977. In the first one there are estimates of the weighted averages of legal tariffs for the years 1959, 1969, 1976, 1988, 1991, 1993 and 1997. In the other two works there are estimates of the weighted averages of implicit tariffs for the years 1969 and 1976 respectively. When comparing these implicit tariffs measures with the legal tariffs for the same two years depicted in the first work, it is found that implicit tariffs were lower than legal ones in a 27 per cent in 1969 and in a 62 per cent in 1976⁶. With this information, including direct measures for the last fifteen years of the period, we consider that a reasonable guesstimate for the impact of trade policy on importable non food manufacture assistance could be built in the following way.

We used for the first year of the period, Macario 1964 legal tariffs estimate, reducing it in a 27 per cent to go from explicit to implicit tariffs. From 1960 to 1969 the values were annually reduced to reach 1969 Berlinski's implicit measure. Again, this value was annually reduced to reach 1976 Berlinski's implicit measure for this year, and from this year to 1988 the annual values were adjusted in the same way to reach Berlinski's legal tariffs for this year reduced in a 40 per cent. From 1988 to 1991 the values were again yearly adjusted to reach Berlinski's 1991 legal tariffs value. From here on, not any adjustment was done to correct for implicit tariffs. Only Berlinski's legal tariffs were taken, and for the last years tariffs legally applicable were directly measured. The series obtained for non food manufacture importables for the whole period appears as satisfactory. The ad valorem effective (implicit) nominal tariff on industrial importables goes from 103 per cent in 1960 to 16 per cent in 2005. This guesstimate appears consistent with the evolution of import trade policies along the 46 years of our period of analysis.

⁶ This high difference between the two years should be partially explained by the fact that the measurement of implicit tariffs for 1976 was more comprehensive than that of the other research.

The exportable components of this sector were Hide Manufactures for the whole period, Basic Iron and Steel Industries since 1975, and Manufacture of petroleum products since 1989. In his case, data on Berlinski's papers and legally applicable export taxes and export reimbursements obtained from la Guía Práctica, were used. For the non tradable components of non food manufacture, the guesstimate was defined as zero.

The last sector, Services, was considered as all non tradable, and the guesstimate for assistance was set at zero.

The next step was the estimation of the DRA_M for all the importables in the five sectors, the DRA_X for all the exportables in the five sectors, and the DRA_{NT} for all the non tradable in the five sectors.

Finally, getting together those three indicators, the Direct Rate of Assistance (DRA_N) for all non agriculture was estimated.

Total Rate of Assistance to agriculture

Just subtracting DRA_N from DRA_A , the total rate of assistance (TRA) to primary agriculture is obtained. This is a summary measure. If its value is negative, it is measuring, within all the economy, the discrimination, both direct and indirect, against primary agriculture of trade and pricing policies.

Relative Assistance Index

This indicator (RAI_t) measures relative assistance to primary agriculture, but instead of considering all the economy, only tradable products are included. If its value is negative, it is measuring, within all tradables, the discrimination against primary agriculture of trade and pricing policies.

Anti-trade Bias Index

This indicator measures a bias against trade within agriculture. It is obtained both for primary agriculture (ABI_t), and for light processed "agriculture" (ABI_p). If its value is positive, it is measuring, within agriculture, the discrimination against trade of trade and pricing policies.

Results

Direct Assistance

Nominal Rate of Assistance

Table 1 shows the Nominal Rates of Assistance at the farm (NRA_f) for the six primary agricultural products selected. We will comment on these results from six points of view: general appreciation, long run evolution, short-medium run evolution, behavior across products, behavior across methods, and a first explanation.

General appreciation As it was advanced in the introduction, the data in the table depicts the suggestive behavior of Argentine agricultural trade pricing policy. The most efficient and competitive tradable sector of the economy has been strongly disprotected through direct export taxation.

Long run evolution In Figure 3 appears an aggregated measure (simple average) of the NRA_s for our selected products for all the period, including a Hodrick-Prescott filter. It can be observed a light tendency for a reduction in the rate of nominal direct disprotection for primary agriculture. This reduction has been influenced by two facts associated with the 1990s: one, as it was mentioned, is that the policy makers of the convertibility program wanted a more open economy, and so they disliked export taxation; and two, the prolonged strong real appreciation of the local currency along the 1990s which would have made high export taxes quite unsustainable in terms of agricultural profitability.

Going to long run evolution for particular products, Figure 4 shows the cases of wheat, corn and cattle for which we have information for all the period. It is interesting to observe that while for corn there is not a reduction in disprotection and in wheat appears a light long run reduction, in cattle the reduction is well apparent. These product specific differences in the long run evolution of assistance were associated with different TFP increases along the period in each product (see, Sturzenegger et al. 1990)⁷.

Short- medium run evolution The short-medium run evolution of the NRA_s appears as very volatile. The main explanatory factor of this evolution is the short-medium run volatility of the RER. We show the relation between the NRA_s and the RER in Figure 5 in which in order to simplify the view, we use the simple average measure of NRA_s introduced above. In the figure it is observed that rates of assistance are positively correlated with the RER. When this

variable is high (real appreciation of the peso) rate of assistance is also high (less negative, or even positive). If we make reference to disprotection, the correlation is negative (inverse), as in the last four years of our period when the peso has been real depreciated and disprotection has been high. We will return to this relation between the NRAs and the RER below.

Behavior across product It has been shown that primary agriculture in Argentina have experienced strong disprotection. Nevertheless, there appear differences across products. Disprotection in soybean and sunflower grains tend to be the largest ones. This is probably explained by two factors: one, the objective of given support to the important exportable industry of oilseeds byproducts; two, the higher TFP and yield possibilities of these two products in relation to the others. Another difference appears in relation to raw milk, in the sense that nominal disprotection has been almost nil. Probably this is on account of a lower TFP in this product. But the most interesting difference, as we mentioned above, is that related to the long run evolution of NRA_t across products, for instance, between corn and cattle.

Behavior across methods We indicated that for Argentine great exportables it is possible to obtain similar results using price comparisons method or explicit tariffs method. This is so, on one side, because in all points of the value chain, markets are characterized with strong competition and so price comparisons should be only capturing economic policy distortions, which is what validates this method; and, on the other side, as export taxes are the determining origin of relevant distortions for such exportables, the explicit export taxes method appears as also valid.

Now, in order to get a more detailed comparison of the strengths and weaknesses of the two methods in the Argentine case, we include in Figure 6 for each of our four selected grains, the results obtained using both methods for the period 1994-2005. As it can be seen, the differences between the two methods for corn and soybean are minimal. Volumes of production and of exports for these two grains are enormous and so they are the exportables for which markets perform better. That is why price comparison gives results so close to explicit export taxes method. In the case of wheat the differences, although not very large, are greater. Markets do not function in wheat so well as in corn and soybean, and then it happens sometimes that the observed FAS price does not coincide with the theoretic FAS price

⁷ Differences in TFP increases in these products are well documented in several studies. See, for instance, World Bank 2006.

because of market disarrangements. The largest differences between the two methods appear in sunflower grain, where price comparisons show larger disprotection values for this product than those estimated with the explicit export taxes method. As mentioned, in sunflower markets there probably exist some degree of monopolistic behavior between processors which allow them to pay prices below export parity ones.

What these results tend to show is that for the Argentine great exportable products the explicit export tax method appears as more accurate, because sometimes price comparisons compute markets disarrangements together with distortions. Anyway, for some situations price comparisons could perform better. For instance, in last year (2006), in front of increases in international prices of wheat, the government decided to increase export taxation on this product in order to hold domestic prices of wheat byproducts stable, but instead of using an explicit increase in the export tax, it raised the reference price of wheat used by the internal tax administration to fix the amount of the export tax. In fact, distorted effective taxation rose although the explicit tax remained the same.

A first explanation Taking account of the findings of the previous five points, it appears clear that the NRAs have accomplished a *compensatory* role in the case of primary agricultural products. When changes in different non distortive⁸ variables as the RER, or international relative prices of each product, or relative TFP of each product, affect agricultural incentives, then the NRAs also change, and they do it accomplishing a partial compensatory behavior. For instance, when the RER depreciates reducing relative prices of non tradables, and so improving agricultural incentives, then export taxation rises absorbing part of such incentive improvement.

In order to have some quantitative approach to such compensatory role, we show in Table 2 three regressions for wheat, corn and soybean, where the explained variables are the log of $1 + \text{NRA}_i$ for each product, and the explanatory variables are the log of the RER and the log of the international relative price of each product. It can be seen in the table how well the NRAs are explained by the RER and international prices. In the case of soybean, although international prices have the right sign they do not appear significant. This is explained because the period is shorter for this grain and in the last 20 years of our period, the RER variable is the predominant explanatory one.

⁸ Defined as non distortive in agreement with the project methodology.

Taking account of such results, it appears that the role of the NRAs has been not only compensatory but also *perverse*. For instance, if a real depreciation of the local currency occurs, implying that the opportunity price of foreign currency is higher for the economy, as it happened in the last four years, agricultural pricing policy decides then to increase export taxation to the sectors more able to “produce” foreign currency.

The compensatory role that the NRAs have played in relation to changes in the RER and in relative international prices, seems to extend to changes in relative⁹ TFP for each product. Signs of this last relation are what we observed when analyzing the behavior of the NRAs across products, as taxing soybean more than raw milk, or reducing taxation on cattle raising because the slow down that experienced relative TFP growth in this activity. It is clear that the compensatory role played with respect to international prices and TFP was also “perverse” in the sense defined above.

Which could be the explanation of such pervert compensatory role of export taxation in Argentina? The existence of a conservative-perverse policy maker? Of course not. In the next section we develop a full political economy explanation of such role.

Table 3 shows the NRA_p for the four lightly processed food products that we have selected. For beef and powder milk the NRA_p s were estimated for the whole period as they were necessary for the estimation of the NRA_s for the two primary products, live cattle and raw milk. In the case of the other two light processed food products, the estimation starts in 1994.

In relation to beef the series is almost identical to the NRA_r as the two transmission factors (the θ s) are almost identical to one. In the case of powder milk, since it becomes an exportable in 1989 it received some assistance, although after the large real depreciation of 2002, it was taxed. In 2005 disprotection rose on account of higher international prices for exports of powder milk.

In the cases of soybean and sunflower byproducts it can be observed that the negative assistance is lower than that of their respective primary inputs, soybean and sunflower grains. This trade policy is oriented to provide effective protection to the value added of the two processing activities.

Consumer Tax Equivalent

⁹ Relative to the economy as a whole.

Table 4 contains the values of the CTE for all primary agriculture and for all lightly processed food. The data show a trend of reduction in the consumption subsidy.

Direct Rate of Assistance

Results for the DRAs for the six primary products can be observed in Table 5. In relation to cattle, as it was mentioned, lack of information prevented estimation of DRAs different from NRAs. With respect to raw milk the DRAs were computed as zero for the period when the trade status for this product was defined as non tradable, and when it was defined as a non traded exportable, the differences with the NRAs are negligible.

To comment on the results for the four grains, we should split our period into two shorter ones: the first 31 years and the last 15 years. In the first, the relations between the DRAs and the NRAs are rather erratic. This is because there are compensating effects when introducing distortions through inputs. On one side, the disprotection on the seed input protects the product, while the protection on most of the other inputs as fertilizers, agrochemicals, etc. disprotect the product. When considering all this first period and all the grains, the two forces working in opposite directions have one another somewhat neutralized, and so the introduction of input distortions, in the aggregate, does not significantly change the NRA. In the second shorter period, the situation has been different: disprotection including inputs is larger than the one without including them. This result has three reasons: a. The generalized use of hybrid seeds in corn and sunflower, inputs that were considered in this second period as non distorted; b. The low level of disprotection experienced for wheat and soybean in their seed inputs in the nineties; and c. The greater use per hectare of protected non seed inputs as fertilizers, agrochemicals, etc.. Actually, taken the simple arithmetic mean of the DRAs for the last fifteen years of our period and for the four grains, gives a value of -14.5 per cent, while the value of the same measure for the NRAs is -10.0 per cent. In Table 6 we show direct assistance to the selected lightly processed food products. It is clear that Argentine trade policy taxes primary agriculture and not processed "agriculture". While for powder milk and beef only for the last four years appears a very small disprotection, for soybean and sunflower byproducts, for the period measured, there is a high level of assistance. As we mentioned above this assistance comes through the strong negative assistance to soybean and sunflower grains.

Aggregated Direct Rate of Assistance for all agriculture

Table 7 shows the aggregated measure of the DRA_A . It appears there the DRA for the selected products and the DRA for the rest of primary agriculture. Although we use as guesstimates for the rest many rates of assistance obtained for the selected products, disprotection in the rest is lower. This is so because the weighted basket of products is different and because in some cases and for some years we use as guesstimates explicit tariffs instead of the DRAs obtained for the selected products.

There is almost not any trend in the aggregated DRA_A . The slight trend that appeared in the aggregated measure of the NRA_f for the selected products disappears because of the agricultural disprotection that came through inputs in the last 15 years as was commented above.

Indirect Assistance

The results for indirect assistance guesstimates for the five groups suggested in the project methodology, and the total value for DRA_N are shown in Table 8. It can be observed that for the first group, lightly processed foods, it is confirmed what we said above that Argentine trade policy taxes primary agriculture but not "processed" agriculture. In any case, protection for this group is not very high, with the exception of the last years on account of high protection to soybean byproducts.

The next group in the table is highly processed food products. It can be observed that for this group, in the last four years it appears some persistent negative assistance associated with export taxes that, after the real depreciation of 2002, were applied to all exports. This result somewhat contradicts the above statement that "processed" agriculture is not taxed in Argentina. This can be explained by taking into account that the guesstimate we have used is explicit export taxation, without adjusting for protection that could come through disprotection to primary inputs.

The next group is non agricultural primaries. We remember that up to 1993 it was impossible to define the trade status for this tradable sector and so we guesstimate as zero the rate of assistance. Later, when it is defined as exportable, it appears as lightly protected in the nineties and highly taxed after the 2002 real depreciation of the local currency.

The next is the decisive group related to indirect assistance to agriculture, i.e. non food manufacture. As it was already commented, there is a well defined trend of reduction in assistance to this group, overwhelmingly originated in reduction in protection to the importable component of this group. This last trend, in large part, determines the evolution of the RAI_f to primary agriculture.

The final group is services with it guesstimate of zero assistance.

The last column of the table shows the aggregated DRA_N . As in the case of non food manufacture there is a well defined declining trend in assistance, although clearly smoother because of the incidence of the zero rate of services. This trend, in large part, determines an inverse trend in the TRA.

Total Rate of Assistance to agriculture, Relative Assistance Index and Anti-trade Bias Indexes

In Table 9 in the first column we can see the TRA for all primary agriculture including both direct and indirect assistance. As it was mentioned, there is a defined trend in this measure: assistance has been increasing or disprotection has been declining. This result is overwhelmingly explained by the reduction that has experienced the DRA_N . We should remember that we did not find any trend in the DRA_A . In any case the present situation indicates that negative total assistance to primary agriculture in Argentina is around 24 per cent.

In the second column we find the values for RAI_f . While when measuring TRA we move within the whole economy, in this case we move only within tradables. The negative protection against primary agriculture appears larger in this case, mainly explained by the high protection given to the importable component of the non food manufacture sector. Anyway, there is an increasing trend in this measure indicating a reduction in relative negative assistance to agriculture. At present the relative negative assistance to agriculture within tradables is around 26 per cent.

In the third column appears the ABIs. In a. it is the ABI_f , the anti-trade bias within primary agriculture between exportables and importables. As we did not measure any importable we assumed that the DRA_{fM} are zero. The values, as expected, indicate a strong anti-trade bias against agricultural exportables. There is not any trend here. In b. it is the ABI_p , the anti-trade bias against exportables within light processed products. The anti-trade

bias does not appear here. Actually, there is a slight pro-trade bias here. As it was mentioned, trade and pricing policies in Argentina do not discriminate against exportable "processed agriculture".

The political economy of agricultural distortions in Argentina

A general view of the results commented in the last section seems clear. Primary agriculture in Argentina, taking an economy wide perspective, has been strongly disprotected through trade and pricing policies. The weighted average for all the period and for all agriculture of the negative total assistance (TRA) that the sector received, reach a value of -24.0 per cent. This negative assistance had three components: a. Nominal direct assistance (NRAf), instrumented almost exclusively through export taxation, which explains the largest proportion of that value; b. Distortions on agricultural inputs, instrumented through trade policies on those inputs, which as was commented, only became relevant in the last fifteen years, when it explained around 4 points of that value; and c. Nominal indirect assistance DRA_{NA} , instrumented mainly through trade policies on Non Food Manufacture sector, which, although was important in the first two decades of our period of analysis, in the last fifteen years it explains only 2 points.

Giving such results, if we want to elaborate on the political economy mechanism able to explain the behavior of government intervention towards agriculture, it is clear that we should concentrate in the explanation of export taxation because of two unquestionable reasons: i. That this instrument determines a very large proportion of the value of TRA; and ii. That, of the three components of assistance, it is the only one directly oriented towards the sector. The other two components are trade policy measures oriented, in general, to non agricultural objectives. They affect agricultural incentives, but they take part essentially in non agricultural trade and pricing policies.

Which could be the explanation of the suggestive compensatory and economically perverse role that has played export taxation to agriculture in Argentina in the last 46 years? In the first place we need to explain why the macroeconomic policy makers in Argentina have had such strong preference for applying export taxes to agriculture. Several reasons to explain such preference were considered in different works on Argentine economic history

and on its rural sector. (See, for example, Diaz Alejandro 1975; Mallon and Sourruoille 1975; Nuñez Miñana 1985). It was also extensively treated in Sturzenegger et.al. 1990. On other view, different reasons can be found in explicit statements of ministers of economy when justifying the existence of export taxes on agriculture.

Earlier, we commented how in the early post-war period, export taxes on agricultural products were introduced for the first time as an instrument to indirectly protect the industrial development that had taken place during the war. But later, macroeconomic policy makers continued using such instruments. They found justifications on two set of reasons. First, because they thought that such export taxation satisfied different important economic objectives as:

- Fiscal objectives, as that taxation could allow to collect high levels of public revenues, that could be obtained without major lags and with very low collection costs.
- Stabilization objectives, as that taxation reduces prices, or nullify potential increases, of agricultural staple and wage goods.
- Industrial (and other tradables) support objectives, as that taxation favour real depreciations of the currency, and reduces prices of wage goods allowing for reductions in industrial wage costs.
- Distributive objectives, as that taxation implies real income transferences from land owners to staple and wage goods consumers, and to public expenditures which, in general, have equalizing redistributive impacts.

Second, although policy makers recognized that such taxation had resource allocation costs, they thought that these costs were not very high. Probably, they thought in that way because of:

- The very high competitiveness of Argentine agricultural production, which leads policy makers to think that export taxation was not going to endanger substantially such production.
- The fact that as in Argentina's agricultural production, land is a very important input, and as it does not have any alternative production use¹⁰, resource allocation costs would not be very high.

¹⁰ In fact, the only alternative use is urban development but it represents a tiny proportion of rural land in Argentina.

- The idea that price elasticity of agricultural production was low on account of low entrepreneurship of land owners and other structural characteristics of agricultural production. In fact, this idea has lost ground almost completely in the last 20 years mainly after important research works on Argentine agriculture (see for example, Reca 1974; Fulginitti 1986). Also, as we mentioned, the introduction of contractors and planting pools, have assured high levels of efficient entrepreneurship in the rural sector of Argentina.

The combination of the existence of those four economic objectives, all of them important for the macroeconomic teams, with their belief that allocation costs of export taxation may be rather low, inclined the balance between taxing or not taxing the agricultural sector strongly in the direction of the first alternative.

Up to now, we have shown why macroeconomic teams are very fond of using export taxes to agriculture. But it is clear that justifying such preference of the policy makers is not a complete political economy explanation. Something is missing. The core of what is additionally required for a complete explanation is associated with the following two questions:

- If export taxes are a so desired instrument for policy makers, why they do not go all the way in introducing them, i.e. why they do not increase those taxes to the point where land rents¹¹ are zero?
- Why along the period studied there have been several cases in which different policy makers, even with opposing ideological and political backgrounds¹², decided to reduce export taxes?

In Sturzenegger et.al. 1990, a political economy scheme was developed that allows us to complete the explanation of export taxation in Argentina. That scheme introduces the idea that such taxes are more the equilibrium result of the functioning of a "political market", than the result of decisions taken by a fully autonomous policy maker. In other words, in the Argentine case there are elements of pressure group action, and consequently export taxation is more an example of an endogenous "tariff" than of a fully exogenous one.

In brief, the model suggests that such political market has two sides: on one side there are the policy makers (basically the macroeconomic government teams), supported, in general and not explicitly, by industrial interests¹³, while on the other side are agricultural

¹¹ And consequently, land values.

¹² See Sturzenegger et. al. 1990.

¹³ Not all of industrial interests. For instance, industrial providers of agricultural inputs, are not included.

interests. The first side always desires high export taxes to agriculture. The second desires null export taxes.

Although there are two sides in such "political" markets, it is also assumed that there is an asymmetry in pressure group action between each side. While the pro taxation side is permanently active in trying to get its objective, the anti taxation one becomes active only when the level of taxation becomes unsupportable for it, that is, when taxation is so high that the real income per hectare is below a certain threshold, probably historically determined. As previously mentioned, the historical episode of very low relative prices for agriculture during the Second World War probably had great importance in the determination of the level of such threshold.

Such assumption of asymmetric behavior in pressure group action is consistent with the facts that while the pro taxation side is monolithic (the macroeconomic team) and highly concentrated (the industrial group), the agriculture pressure group is highly dispersed along all Argentina and enormously numerous (with hundred of thousand units), and so it is very difficult to activate it as a powerful pressure group¹⁴. It only becomes powerfully activated when that threshold is not reached.

Applying such political economy scheme, the answer to the previous two questions is easy to find. The pro export taxation side, at any time, cannot go all the way towards setting land rents in zero because this situation would imply that the level of taxation results unsupportable for the rural side. Also, at any moment, the effective level of real rent per hectare depends on relative agricultural international prices, on the RER, on the agricultural relative TFP, and on the level of export taxation. It is precisely this statement that allows answering the second question. If, for instance, for a given level of export taxation, international agricultural prices go down, such level of export taxation may become unsupportable for the rural group. In this situation, although policy makers do not want to reduce export taxes, they are successfully pressured by the rural group to do it.

The political economy scheme assumed, not only allows answering the two previous questions, but it is also fully consistent with the compensatory and perverse role played by export taxation in Argentina, that we found in the last section. Let us take for instance the RER variable. Changes in this variable imply changes in real rent per hectare. More than fifty percent of producer costs at the border point of the value chain are non tradable factors, goods and services, including wages, a large part of "structure costs" (general administration, public and private services, domestic taxes), a large part of trading costs (Tf) (commissions,

¹⁴ See, Olson (1971).

handling, storage, transport), and a large part of “retirements” (living expenses of the rural family). So if, for instance, the RER depreciates, relative prices of non tradables will go down and so real rent per hectare will go up. At this point, with the improvement in such real rent, the rural pressure group will be completely inactive, and the pro taxation side will take advantage of this situation raising export taxes, and so reducing such rent per hectare. The compensatory role is evident. But it is also perverse. In spite of the fact that a real depreciation means an increase in the opportunity price of foreign currency, the policy makers decide rising the discrimination against the sector more able and efficient to provide such foreign money.

The same compensatory and perverse role is played in front of changes in relative international agricultural prices and in relative agricultural TFP.

The political economy model just described was developed in Sturzenegger et.al. 1990. This research for the period 1960-1985, was finished in 1987. When using the measures obtained in Valdés and Schaeffer (1995) and those computed in this paper, we are able to analyze the period 1960-2005. This extended view of distortions on agricultural incentives in Argentina, allowed confirming such political economy model.

Nevertheless, the introduction in 1991 of the convertibility program represents the point farther away from our endogenous tariff hypothesis. As it was commented, policy makers who introduced convertibility had a strong preference for reducing the antitrade bias embedded in Argentinean external trade policy. This preference implied reducing or eliminating export taxation and reducing tariff and non tariff protection to importables. Also, the convertibility program established the prohibition for the central bank of financing fiscal deficits with money creation. Money could only be created through the functioning of a currency board scheme with a one to one nominal conversion rate with the dollar. Under convertibility, prospects for price stability were very strong and they effectively took place in the economy. All this meant that fiscal and price stability urgencies, were much weaker during convertibility and this also supported the reduction in taxation to agriculture. It seems that the governmental team who introduced the convertibility program has been closer to represent an autonomous decision maker, and that the reduction in agricultural export taxes that took place in the nineties, has been closer to represent a true exogenous tariff case. However, it is also true that, because of the strong real appreciation of the local currency along the 1990s, the rural rent per hectare, in spite of the elimination of agricultural export taxes, was not far away of the historical threshold that we use in the functioning of our

political economy model, as it is confirmed with the fact that real prices of pampean land did not experience major increases in that decade.

Since 2002, with the important real depreciation of the peso, with improvements in agricultural international prices, and with the existence of stability and fiscal problems, the suggested political economy model and, consequently, export taxation, strongly reappeared.

Prospects for the future

Let us comment on these prospects using three time horizons: short, medium and long run. In the short run, one year or so, the political economy game described in the last section will be played without any change in its rules, and presumably export taxation is not going to experience any major change. At this moment, fiscal and stabilization pressures over the macroeconomic team to maintain such taxation on agriculture, remain very strong. Although there is a large primary surplus in public accounts, maintaining or increasing this surplus is the predominant economic objective of the present government. With respect to the stabilization objective, along last year (2006), the economic team applied strong agricultural income and price policies in order to interrupt a worrisome acceleration in the inflationary process originated in increases in international prices of beef, dairy products, wheat and corn. On the exchange market side, the strong intervention of the Central Bank buying dollars and euros is supporting the real depreciation of the peso, and so it is avoiding the possibility of a rapid reduction in real rent per hectare in agriculture. As a matter of fact, discrimination against agriculture in these last months has become harder, reaching in beef to partial export prohibitions, and in powder milk, cheeses and other dairy products, to quick rises in export taxes directed towards compensating increases in international prices of those products.

In the medium run, four years or so, the prospective situation appears somewhat different, and reductions in the level of agricultural export taxation appear as probable events. This result will not be associated to possible changes in the rules of the political economy game, but will be related with the evolution of economic variables within the game, which will probably move in the direction of triggering an activation of pressure group action by rural interests. This activation should eventually lead to a reduction in export taxation to agriculture. The main economic variable that will push such triggering is the RER. In spite of the possible continuation by the Central Bank of its present policy of accumulating foreign

reserves, the most probable evolution of this variable will be in the direction of reducing the present real depreciation of the peso. Gradually, such evolution will reduce real rents per hectare which will drive the rural lobby to its activation, and then to the reduction of export taxes. Along 2006, there were already some weak signs of pressure group action by rural interests. These signs will strength as much as real depreciation will reduce. Now, in fact, the reduction of such rent per hectare in the following years will depend, in agreement with the logic of the political economy scheme, of the relation between changes in the RER, in relative agricultural international prices, and in relative agricultural TFP. For instance, if agricultural international prices rise, in spite of a future decrease in the RER depreciation, the pace of reductions in export taxation will probably slow down.

The view may be different in the long run. Within this time horizon, the possibility of significant changes in the basics of the rules of the agricultural political economy game in force in the last 60 years, is probable. We saw three lines of future events that may drive such changes. The first is related with the rural side of the game. It is the possibility of changes in the characteristics of pressure group action of rural interests. Specifically, the possibility that this pressure group becomes permanently active overcoming the present situation in which it is active only in front of unbearable losses. The problem with this possibility is that it is in the nature of such dispersed and numerous groups that it only gets active under extreme negative situations. The second is related with the other side of the game, specifically with the possibility that in the policy makers ranking of economic objectives, fiscal and stability objectives, which were the main drivers for agricultural export taxation, will lose ground. For the first time in more than half a century, Argentina is experiencing a large fiscal surplus at the national level, which is supporting very promising public debt reductions. In fact, last year (2006) the relation of such debt with the GNP has reduced at a high pace of almost ten percentage points. Also, tax evasion on major taxes (VAT, Income, Social Security Taxes) is clearly being reduced. Perhaps fiscal anguishes will disappear in the future. If, additionally, harder monetary policies are applied, also inflationary anguishes may evaporate. Moreover, some reforms could be introduced in provincial rural land taxes which could provide more fiscal revenues. With all these ingredients, is possible that the fiscal and stabilization macroeconomic objectives may become much less demanding for the macroeconomic teams, and so they eventually may decide to eliminate export taxation to agriculture replicating the experience of the 1990s, and this time not necessarily associated with a real appreciation of the RER.

But it is a third line of possible future events which will probably be the stronger factor of change. A crucial component of the political economy game played has been the competitive edge of pampean land with respect to the average agricultural land in the world. Sometime in the future such edge, on account of steadily advances in technology, specially in biotechnology, could be reduced to tiny proportions. More and more the balance between the ricardian original and indestructible factors of competitiveness and man created factors, will change in favor of these ones, and at some moment export taxes on Argentine agricultural production will become incompatible with competition in a world scale.

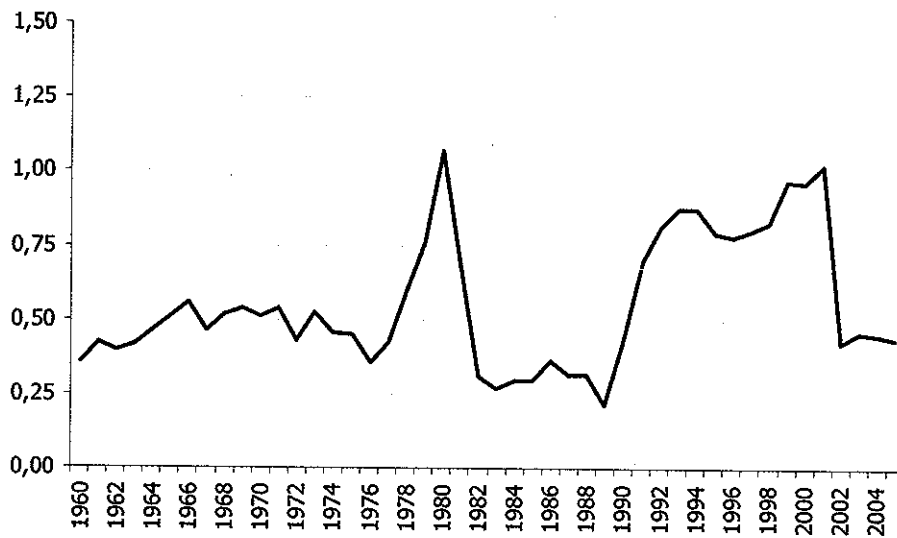
References

- Agricultural Secretary (SAGPYA) (2006), Ministry of Economy of Argentina (MECON), Bolsa de cereales de Rosario, Cámara de la Industria Aceitera de la República Argentina (CIARA), Journal Márgenes Agropecuarios and J.J. Hinrichsen S.A.
- Anderson, K., W. Martin, D. Sandri and E. Valenzuela (2006), *Methodology for Measuring Distortions to Agricultural Incentives*, Agricultural Distortions Research Project Working Paper 02, World Bank, Washington DC, August.
- Berlinski, J. (1977), *La protección arancelaria de actividades seleccionadas de la industria manufacturera argentina*, Ministerio de Economía. Buenos Aires.
- (1994) *Post Trade Liberalization: Institutional Issues in Argentina*. Working Paper no. 182. Instituto Di Tella. Buenos Aires.
- and D. Schydlosky. (1982) "Argentina", In *Development Strategies in Semi-industrial Economies*, edited by B.A. Balassa. Baltimore, Ms.: Johns Hopkins University Press.
- (2002) *International trade and commercial policy*, Working Paper no: Instituto Torcuato Di Tella and Universidad Torcuato Di Tella. Buenos Aires.
- Brooks, J. and O. Melyukhina (2005), *Estimating The Pass-through of Agricultural Policy Reforms, An Application to Brazilian Commodity Markets*, OECD Food, Agriculture and Fisheries Working Papers No 2, OECD Publishing.
- Díaz Alejandro, C.F. (1975), *Ensayos sobre la Historia Económica Argentina*, in Amorrorrtu (Ed.) (1981), *Tipo de cambio y términos de intercambio en la Republica Argentina 1913-1976*, C.E.M.A., Documentos de Trabajo No. 22, Buenos Aires.

- Fulginiti, L.E. (1986), *The Structure of Agricultural Technology: The Case of Argentina*, mimeo.
- Galetto, A., E. Schilder (1996), *Situación y Perspectivas de Sector Lácteo Argentino*, Publicación Miscelánea N°78, INTA. Estación Experimental Agropecuaria Rafaela.
- Guía Práctica de Comercio Exterior (1990 to 2005), Year Books, with monthly actualization.
- Gutman, G., E. Guigüet and J. Rebolini, J. (2003), *Los ciclos en el complejo lácteo argentino. Análisis de políticas lecheras en países seleccionados*, Secretaría de Agricultura, Ganadería, Pesca y Alimentos. Buenos Aires.
- Krueger, A.O., M. Schiff and A. Valdes (1991), *The Political Economy of Agricultural Pricing Policy, Volume 1: Latin America*, Baltimore: Johns Hopkin University Press for the World Bank.
- IICA, SAGyP (1993): *Estudio de Competitividad Agropecuaria y Agroindustrial. Productos Lácteos*, Documento de Trabajo No CAA/06. Buenos Aires.
- Macario, S. (1964) *Proteccionismo e industrialización en América Latina*. Boletín Económico de América Latina 9 (1): 61-101. Buenos Aires.
- Mallon, R. and J. Sourouille (1975), *Economic Policy Making in a Conflict Society*, Cambridge MA: Harvard University Press.
- Núñez Miñana, H. (1985) *Validez actual del impuesto a la renta neta potencial de la tierra en la Argentina*, Revista Desarrollo Económico, v25, n°98. Buenos Aires.
- Olson, M. (1971), *The Logic of Collective Action*, Cambridge MA: Harvard University Press.
- Reca, L.G. (1974), *El Sector Agropecuario y los Incentivos Económicos en torno a la experiencia de la Argentina en las últimas dos décadas*. Banco Ganadero Argentino, temas de Economía Argentina. El sector Agropecuario 1964/73. Buenos Aires.
- Secretaría de Agricultura, Pesca y Alimentación, Subsecretaría de Alimentación (varios años): *"Informe Estadístico de Leche y Productos Lácteos"*, Buenos Aires.
- Sturzenegger, A. (1990) (with the collaboration of W. Otrera and the assistance of B. Mosquera,), *Trade, Exchange Rate and Agricultural Pricing Policies in Argentina*, World Bank Comparative Studies, Washington DC: World Bank.
- Sturzenegger, A. (1991), "Argentina" in Krueger, A.O., M. Schiff and A. Valdes (1991), *The Political Economy of Agricultural Pricing Policy, Volume 1: Latin America*, Baltimore: Johns Hopkins University Press for the World Bank.
- Valdés A. and B. Schaeffer (1995), "Surveillance of Agricultural Price and Trade Policies; A Handbook for Argentina". (with the collaboration of Sturzenegger, A. and Bebczuk, R.) World Bank Technical Paper Number 294, Washington DC.

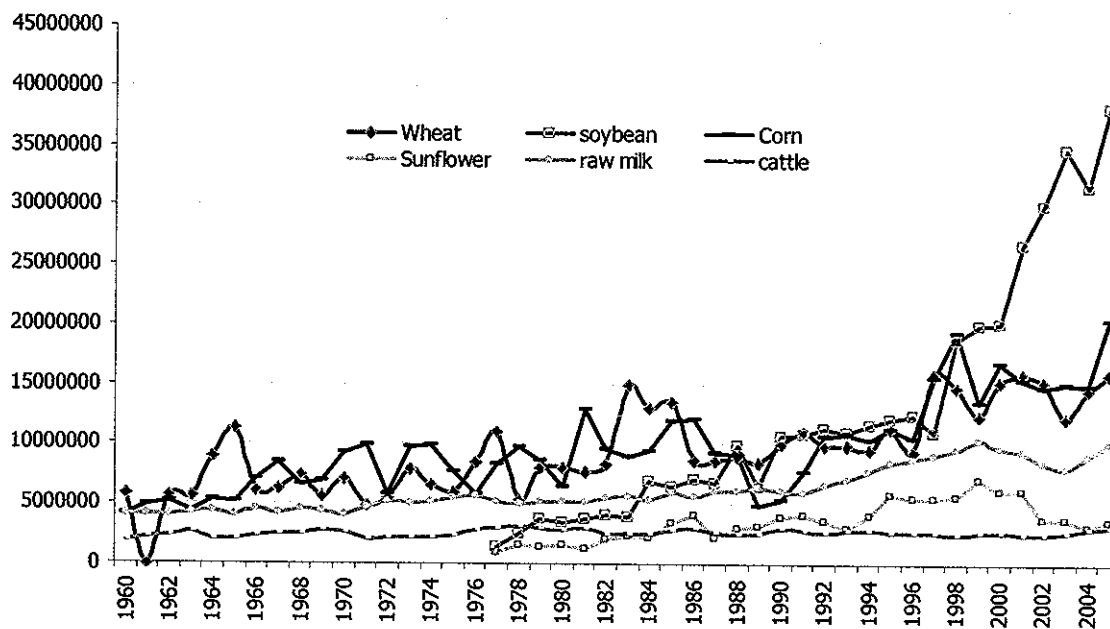
Valdés A. and E. Jara (2006), "Distortions to Agricultural Incentives, Chile- Country Case Study", mimeo.

World Bank (2006), *Argentina Agriculture and Rural Development: Selected Issues*, Argentina, Chile, Paraguay & Uruguay Country Management Unit. Environmentally and Socially Sustainable Unit, Latin American and the Caribbean Region, Report No. 32763-AR., Washington DC: World Bank.

Figure 1: 1960-2005 Multilateral Real Exchange Rate

Source: Central Bank of Argentina

Note: For 1960 to 1989, there is no estimation of the multilateral RER, so the figure includes for that period the bilateral with the dollar real exchange rate.

Figure 2: Wheat, Corn, Soybean and Sunflower production, from 1960 to 2005 (tons)

Source: Agricultural Secretary (SAGPYA)

Table 1: Nominal Rate of Assistance at the farm (1960 to 2005)

	Wheat	corn	soybean	sunflower	cattle	raw milk
1960	-0,37	-0,31	-	-	-0,40	0
1961	-0,23	-0,16	-	-	-0,40	0
1962	-0,22	-0,02	-	-	-0,44	0
1963	-0,13	0,05	-	-	-0,39	0
1964	-0,02	0,01	-	-	-0,23	0
1965	-0,19	-0,09	-	-	-0,35	0
1966	-0,06	0,11	-	-	-0,25	0
1967	0,08	-0,35	-	-	-0,38	0
1968	-0,27	-0,20	-	-	-0,38	0
1969	-0,18	-0,01	-	-	-0,39	0
1970	-0,18	-0,15	-	-	-0,25	0
1971	-0,12	-0,17	-	-	-0,13	0
1972	-0,32	-0,29	-	-	-0,31	0
1973	-0,43	-0,25	-	-	-0,35	0
1974	-0,64	-0,28	-	-	-0,28	0
1975	-0,38	-0,46	-	-	-0,42	0
1976	-0,41	-0,58	-	-	-0,19	0
1977	-0,13	-0,20	-0,18	-0,23	-0,32	0
1978	-0,19	-0,10	-0,15	-0,33	-0,14	0
1979	-0,12	-0,12	-0,12	-0,22	-0,03	0
1980	-0,10	0,06	-0,05	-0,24	-0,08	0
1981	-0,03	-0,16	-0,12	-0,09	-0,36	0
1982	-0,15	-0,16	-0,16	-0,28	-0,35	0
1983	-0,29	-0,29	-0,30	-0,35	-0,31	0
1984	-0,25	-0,24	-0,26	-0,24	-0,21	0
1985	-0,30	-0,23	-0,27	-0,27	-0,18	0
1986	-0,21	-0,31	-0,33	-0,31	-0,08	0
1987	-0,08	-0,23	-0,19	-0,20	-0,08	0,00
1988	-0,02	-0,02	-0,18	-0,14	-0,06	0,00
1989	-0,26	-0,30	-0,38	-0,39	-0,22	-0,03
1990	-0,30	-0,30	-0,36	-0,39	-0,19	0,01
1991	-0,06	-0,07	-0,12	-0,13	-0,05	0,01
1992	-0,02	-0,02	-0,09	-0,09	-0,01	0,00
1993	0,03	0,03	-0,04	-0,04	0,03	0,01
1994	-0,03	0,04	0,00	-0,05	0,04	0,03
1995	0,04	-0,03	-0,03	-0,14	0,04	0,05
1996	-0,03	-0,04	0,00	-0,08	0,02	0,05
1997	-0,07	-0,02	0,00	-0,02	0,02	0,05
1998	-0,04	-0,05	-0,03	-0,10	0,02	0,05
1999	0,01	0,02	0,00	-0,16	0,02	0,05
2000	-0,07	-0,02	-0,03	-0,11	0,02	0,06
2001	0,05	-0,01	0,04	-0,07	0,02	0,06
2002	-0,17	-0,23	-0,29	-0,35	-0,04	-0,05
2003	-0,20	-0,23	-0,27	-0,31	-0,05	-0,05
2004	-0,21	-0,26	-0,29	-0,28	-0,05	-0,05
2005	-0,23	-0,27	-0,29	-0,33	-0,07	-0,09
1960/2005	-0,16	-0,15	-0,15	-0,20	-0,18	0,003
1991/2005	-0,07	-0,08	-0,10	-0,15	-0,002	0,01

Figure 3: Nominal Rate of Assistance at the farm and Tendency (Hodrick-Prescott Filter), 1960 to 2005.

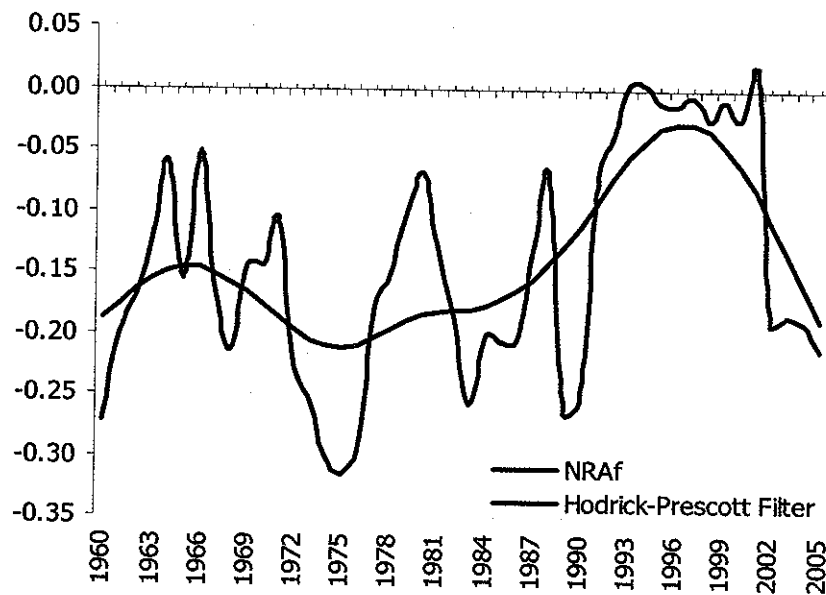


Figure 4: Nominal Rate of Assistance at the farm and Tendency (Hodrick-Prescott Filter), 1960 to 2005.

Figure 4.1: Wheat

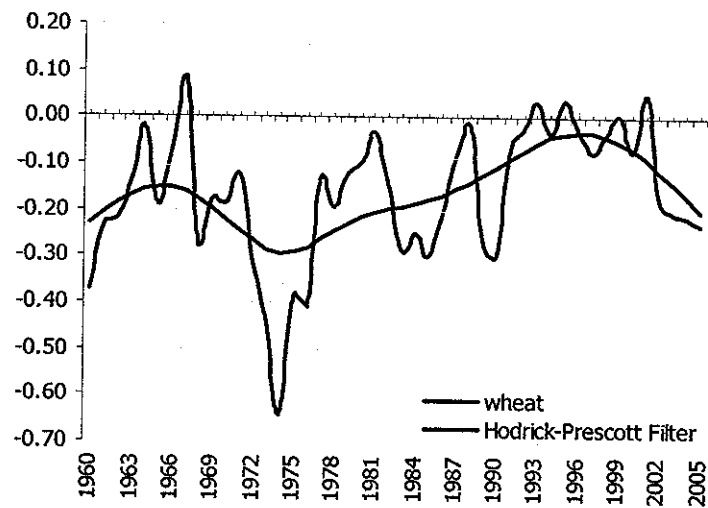


Figure 4.2: Corn

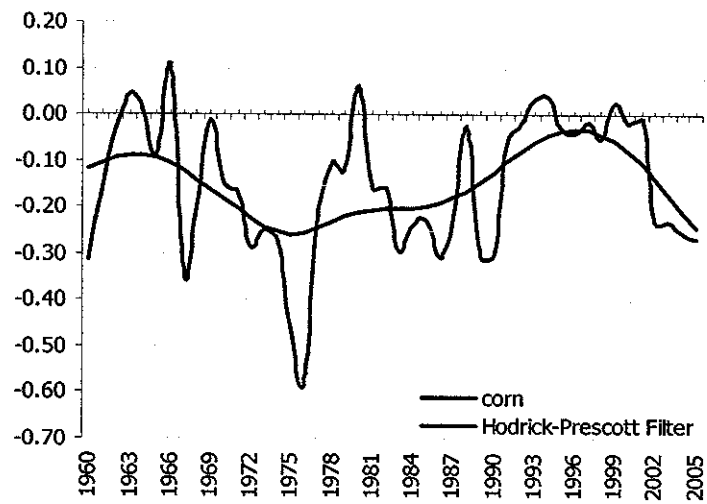


Figure 4.3: Cattle

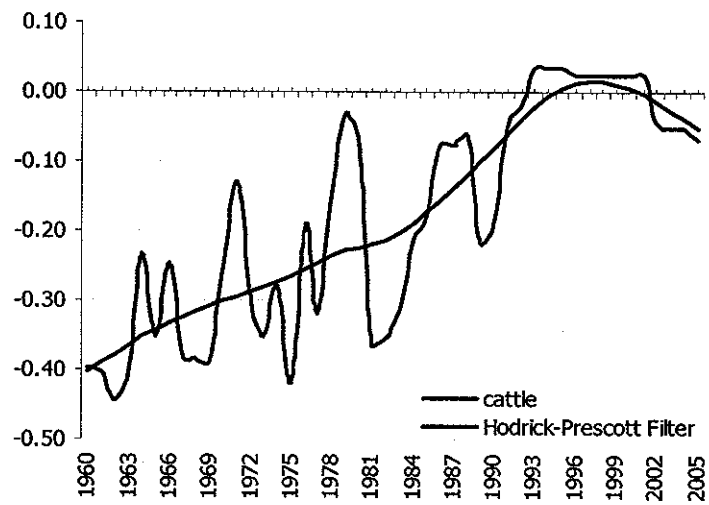
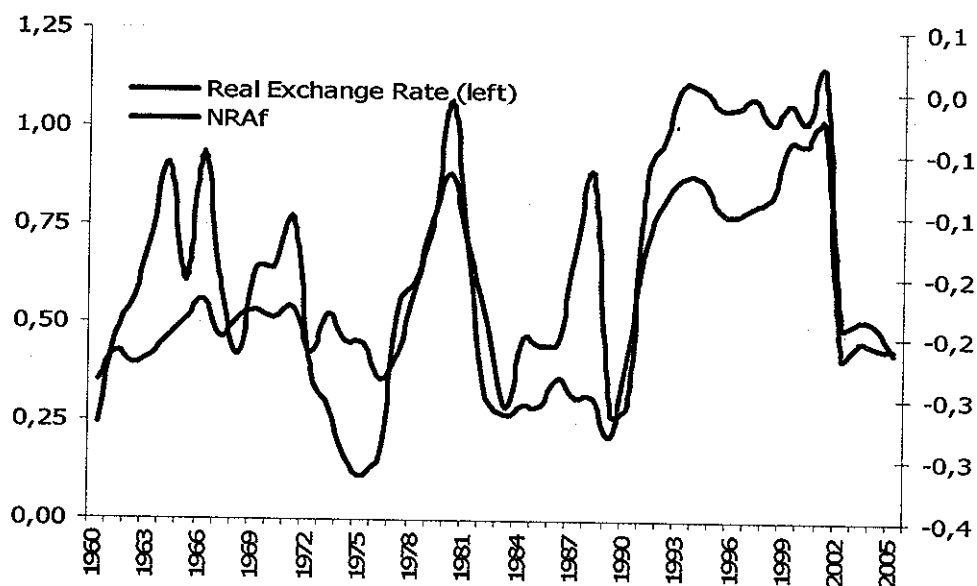


Figure 5: Real Exchange Rate and Nominal Rate of Assistance at the farm, (1960 to 2005)



Source: Central Bank of Argentina

Note: From 1960 to 1989, there is no estimation of the multilateral RER, so for this period the figure includes the bilateral with the dollar real exchange rate.

Figure 6: Comparison of NRA τ measured by the explicit tariff approach and by price comparisons, (1994 to 2005)

Figure 6.1: Distortions on sunflower

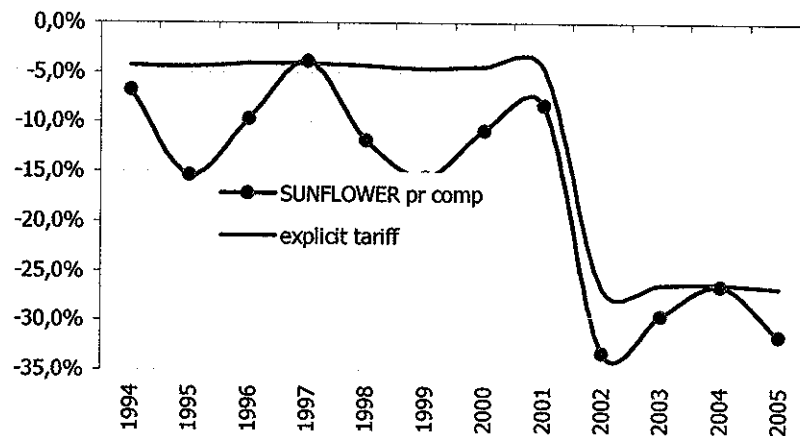


Figure 6.2: Distortions on soybean

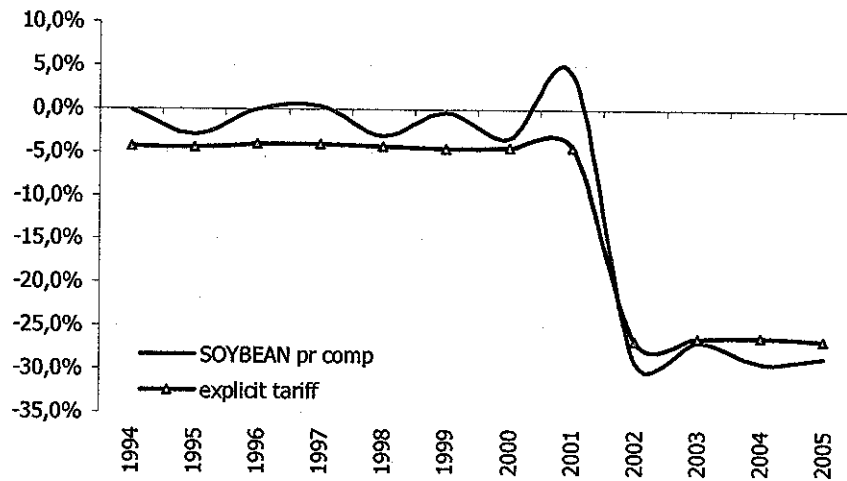


Figure 6.3: distortions on wheat

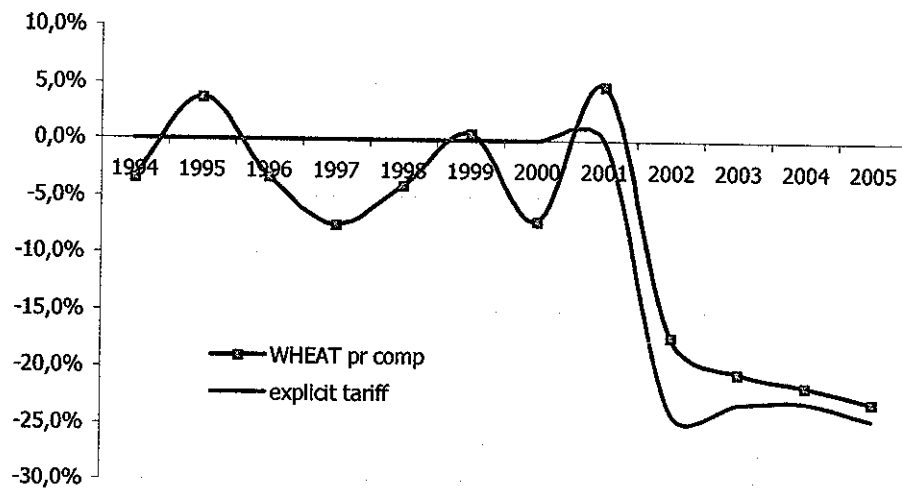


Figure 6.4: distortions on corn

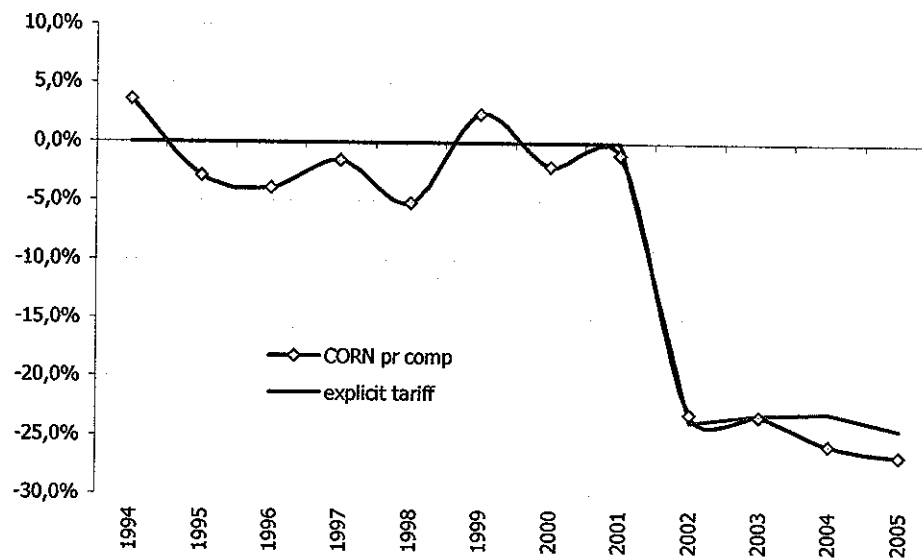


Table 2: Regression results for Wheat, Corn and Soybean

Regression Model: $\log(1+NRA_t) = C + \beta_1 \log(P/P^*) + \beta_2 \log(RER)$

1) Corn

Dependent Variable: NRACORN

Method: Least Squares

Sample: 1960 2005

Included observations: 46

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.467390	0.207834	2.248865	0.0297
LOGFOBCORN	-0.062807	0.028008	-2.242435	0.0301
LOGRER	0.282716	0.056424	5.010570	0.0000
R-squared	0.415930	Mean dependent var		-0.179361
Adjusted R-squared	0.388764	S.D. dependent var		0.191475
S.E. of regression	0.149698	Akaike info criterion		-0.897400
Sum squared resid	0.963608	Schwarz criterion		-0.778141
Log likelihood	23.64021	F-statistic		15.31064
Durbin-Watson stat	1.225706	Prob(F-statistic)		0.000010

2) Wheat

Dependent Variable: NRAWHEAT

Method: Least Squares

Sample: 1960 2005

Included observations: 46

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.711293	0.203844	3.489389	0.0011
LOGRER	0.249376	0.059311	4.204520	0.0001
LOGFOBWHEAT	-0.098836	0.026338	-3.752660	0.0005
R-squared	0.418135	Mean dependent var		-0.196794
Adjusted R-squared	0.391071	S.D. dependent var		0.201620
S.E. of regression	0.157332	Akaike info criterion		-0.797926
Sum squared resid	1.064392	Schwarz criterion		-0.678667
Log likelihood	21.35230	F-statistic		15.45013
Durbin-Watson stat	1.115343	Prob(F-statistic)		0.000009

3) Soybean

Dependent Variable: NRASOYBEAN

Method: Least Squares

Sample (adjusted): 1977 2005

Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.037312	0.140175	0.266185	0.7922
LOGFOBSOYBEAN	-0.006273	0.017620	-0.356030	0.7247
LOGRER	0.275887	0.032884	8.389616	0.0000
R-squared	0.730321	Mean dependent var		-0.179167
Adjusted R-squared	0.709577	S.D. dependent var		0.154430
S.E. of regression	0.083224	Akaike info criterion		-2.036870
Sum squared resid	0.180081	Schwarz criterion		-1.895425
Log likelihood	32.53461	F-statistic		35.20554
Durbin-Watson stat	1.365358	Prob(F-statistic)		0.000000

Table 3: Nominal Rate of Assistance Processed Goods (NRA p), (1960 to 2005)

	soybean byproduct	sunflower byproduct	beer	powder milk
1960	-	-	-0,40	0
1961	-	-	-0,40	0
1962	-	-	-0,44	0
1963	-	-	-0,39	0
1964	-	-	-0,23	0
1965	-	-	-0,35	0
1966	-	-	-0,25	0
1967	-	-	-0,38	0
1968	-	-	-0,38	0
1969	-	-	-0,39	0
1970	-	-	-0,25	0
1971	-	-	-0,13	0
1972	-	-	-0,31	0
1973	-	-	-0,35	0
1974	-	-	-0,28	0
1975	-	-	-0,42	0
1976	-	-	-0,19	0
1977	-	-	-0,32	0
1978	-	-	-0,14	0
1979	-	-	-0,03	0
1980	-	-	-0,08	0
1981	-	-	-0,36	0
1982	-	-	-0,35	0
1983	-	-	-0,31	0
1984	-	-	-0,21	0
1985	-	-	-0,18	0
1986	-	-	-0,08	0
1987	-	-	-0,08	0
1988	-	-	-0,06	0
1989	-	-	-0,22	-0,07
1990	-	-	-0,19	0,02
1991	-	-	-0,05	0,03
1992	-	-	-0,01	0,00
1993	-	-	0,03	0,02
1994	0,01	0,03	0,04	0,07
1995	0,00	0,02	0,04	0,06
1996	0,00	0,01	0,02	0,05
1997	0,00	0,01	0,02	0,05
1998	0,00	0,01	0,02	0,05
1999	0,00	0,01	0,02	0,05
2000	0,00	0,01	0,02	0,07
2001	0,00	0,01	0,02	0,07
2002	-0,14	-0,13	-0,04	-0,05
2003	-0,20	-0,19	-0,05	-0,05
2004	-0,20	-0,19	-0,05	-0,05
2005	-0,20	-0,19	-0,07	-0,10
1960/2005	-0,06	-0,05	-0,18	0,004
1991/2005	-0,062	-0,049	-0,002	0,017

Table 4: Total Consumer Tax Equivalent: Primary Agriculture and Lightly Processed Food (100%), (1960 to 2005)

CTE			
1960	-0.296	1983	-0.226
1961	-0.295	1984	-0.151
1962	-0.323	1985	-0.132
1963	-0.285	1986	-0.058
1964	-0.166	1987	-0.055
1965	-0.256	1988	-0.045
1966	-0.177	1989	-0.133
1967	-0.271	1990	-0.096
1968	-0.283	1991	-0.022
1969	-0.249	1992	-0.006
1970	-0.161	1993	0.019
1971	-0.084	1994	0.019
1972	-0.203	1995	0.018
1973	-0.241	1996	0.013
1974	-0.200	1997	0.013
1975	-0.254	1998	0.013
1976	-0.135	1999	0.014
1977	-0.213	2000	0.015
1978	-0.099	2001	0.011
1979	-0.023	2002	-0.026
1980	-0.058	2003	-0.030
1981	-0.248	2004	-0.029
1982	-0.253	2005	-0.036
		1960/2005	-0.124

Table 5: Adjusted Direct Nominal Rate of Assistance at the farm (DRA f), (1960 to 2005)

	wheat	com	soybean	sunflower	cattle	raw milk
1960	-0,36	-0,32		-	-0,40	0
1961	-0,23	-0,17		-	-0,40	0
1962	-0,21	-0,03		-	-0,44	0
1963	-0,13	0,04		-	-0,39	0
1964	-0,02	0,01		-	-0,23	0
1965	-0,18	-0,09			-0,35	0
1966	-0,06	0,10			-0,25	0
1967	0,08	-0,35			-0,38	0
1968	-0,25	-0,20			-0,38	0
1969	-0,16	-0,07	-	-	-0,39	0
1970	-0,16	-0,20	-	-	-0,25	0
1971	-0,11	-0,17		-	-0,13	0
1972	-0,30	-0,28		-	-0,31	0
1973	-0,42	-0,25		-	-0,35	0
1974	-0,63	-0,28		-	-0,28	0
1975	-0,36	-0,44		-	-0,42	0
1976	-0,40	-0,58		-	-0,19	0
1977	-0,09	-0,20	-0,16	-0,24	-0,32	0
1978	-0,19	-0,11	-0,15	-0,36	-0,14	0
1979	-0,13	-0,12	-0,12	-0,23	-0,03	0
1980	-0,11	0,06	-0,07	-0,25	-0,08	0
1981	-0,04	-0,15	-0,13	-0,09	-0,36	0
1982	-0,12	-0,14	-0,14	-0,26	-0,35	0
1983	-0,27	-0,28	-0,27	-0,33	-0,31	0
1984	-0,21	-0,22	-0,24	-0,24	-0,21	0
1985	-0,26	-0,20	-0,24	-0,25	-0,18	0
1986	-0,21	-0,32	-0,33	-0,32	-0,08	0
1987	-0,11	-0,25	-0,22	-0,22	-0,08	0,00
1988	-0,02	-0,02	-0,17	-0,14	-0,06	0,00
1989	-0,25	-0,30	-0,38	-0,39	-0,22	-0,03
1990	-0,30	-0,31	-0,36	-0,39	-0,19	0,01
1991	-0,06	-0,07	-0,12	-0,13	-0,05	0,01
1992	-0,03	-0,03	-0,09	-0,10	-0,01	0,00
1993	0,02	0,03	-0,05	-0,04	0,03	0,01
1994	-0,12	0,01	-0,06	-0,14	0,04	0,02
1995	-0,02	-0,05	-0,09	-0,23	0,04	0,06
1996	-0,08	-0,06	-0,05	-0,17	0,02	0,05
1997	-0,14	-0,04	-0,05	-0,11	0,02	0,05
1998	-0,14	-0,08	-0,10	-0,18	0,02	0,05
1999	-0,10	-0,02	-0,08	-0,29	0,02	0,05
2000	-0,14	-0,07	-0,08	-0,27	0,02	0,06
2001	-0,03	-0,06	-0,03	-0,20	0,02	0,06
2002	-0,19	-0,25	-0,30	-0,41	-0,04	-0,04
2003	-0,23	-0,25	-0,28	-0,36	-0,05	-0,04
2004	-0,24	-0,27	-0,30	-0,35	-0,05	-0,04
2005	-0,26	-0,29	-0,29	-0,40	-0,07	-0,09
1960/2005	-0,17	-0,16	-0,17	-0,24	-0,18	0,004

**Table 6: Adjusted Direct Nominal Rate of Assistance of the processing sector (DRA p),
(1960 to 2005)**

	soybean byproduct	sunflower byproduct	beet	powder milk
1960	-		0,05	0
1961	-		0,05	0
1962	-		0,06	0
1963	-	-	0,05	0
1964		-	0,03	0
1965		-	0,04	0
1966	-	-	0,03	0
1967	-	-	0,05	0
1968	-		0,05	0
1969	-		0,05	0
1970	-		0,03	0
1971			0,02	0
1972			0,04	0
1973		-	0,04	0
1974		-	0,03	0
1975		-	0,05	0
1976		-	0,02	0
1977		-	0,04	0
1978		-	0,02	0
1979		-	0,00	0
1980	-	-	0,01	0
1981	-	-	0,05	0
1982	-		0,04	0
1983	-		0,04	0
1984	-		0,03	0
1985	-		0,02	0
1986	-		-0,01	0
1987		-	-0,01	0
1988	-	-	-0,01	0
1989		-	-0,03	-0,04
1990		-	-0,03	0,01
1991			-0,01	0,01
1992		-	0,00	0,00
1993		-	0,01	0,01
1994	0,01	0,06	0,01	0,01
1995	0,04	0,12	0,01	0,02
1996	0,00	0,08	0,00	0,01
1997	0,00	0,03	0,00	0,01
1998	0,05	0,09	0,00	0,01
1999	0,01	0,13	0,01	0,01
2000	0,04	0,09	0,00	0,02
2001	-0,04	0,07	0,00	0,02
2002	0,27	0,15	-0,01	-0,02
2003	0,19	0,06	-0,01	0,00
2004	0,25	0,01	0,00	-0,01
2005	0,21	0,07	0,00	-0,02
1960/2005	0,086	0,078	0,018	0,001

Table 7: Direct Nominal Rate of Assistance of total primary agriculture (DRAa), (1960 to 2005)

DRA a			
1960	-0.330	1983	-0.222
1961	-0.300	1984	-0.182
1962	-0.274	1985	-0.185
1963	-0.223	1986	-0.172
1964	-0.108	1987	-0.113
1965	-0.225	1988	-0.082
1966	-0.117	1989	-0.211
1967	-0.257	1990	-0.239
1968	-0.274	1991	-0.066
1969	-0.148	1992	-0.034
1970	-0.127	1993	0.003
1971	-0.074	1994	-0.028
1972	-0.178	1995	-0.038
1973	-0.224	1996	-0.034
1974	-0.252	1997	-0.035
1975	-0.251	1998	-0.054
1976	-0.223	1999	-0.051
1977	-0.157	2000	-0.051
1978	-0.112	2001	-0.023
1979	-0.053	2002	-0.234
1980	-0.060	2003	-0.226
1981	-0.199	2004	-0.229
1982	-0.212	2005	-0.233
1960/2005			-0.155

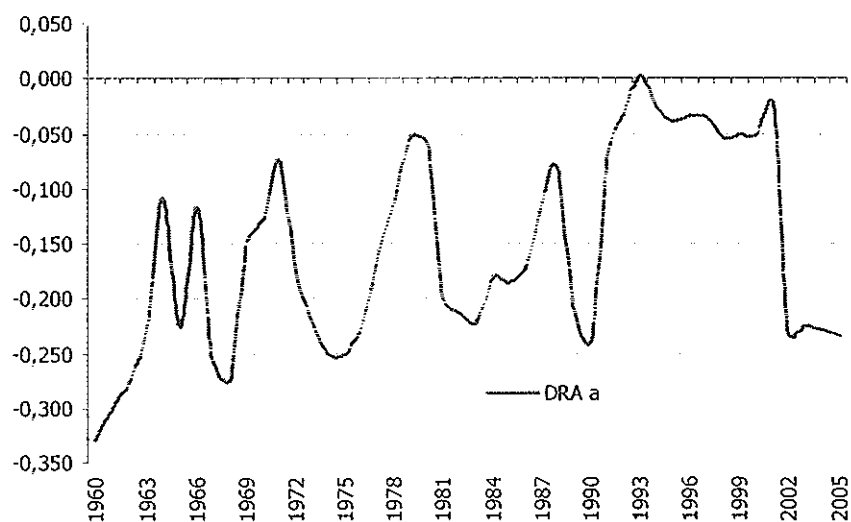


Table 8: Direct Nominal Rate of Assistance of Non Agricultural sectors, (1960 to 2005)

	100% lightlv	highly process food products	non agncultural primary	non food manufactures	services	DRA na
1960	0,036	-0,090	0,000	0,862	0,000	0,241
1961	0,036	-0,082	0,000	0,835	0,000	0,233
1962	0,040	-0,075	0,000	0,810	0,000	0,225
1963	0,035	-0,068	0,000	0,785	0,000	0,217
1964	0,021	-0,062	0,000	0,761	0,000	0,224
1965	0,031	-0,056	0,000	0,738	0,000	0,187
1966	0,022	-0,051	0,000	0,715	0,000	0,215
1967	0,035	-0,047	0,000	0,693	0,000	0,206
1968	0,035	-0,042	0,000	0,672	0,000	0,175
1969	0,035	-0,039	0,000	0,652	0,000	0,147
1970	0,022	-0,035	0,000	0,585	0,000	0,131
1971	0,011	-0,032	0,000	0,526	0,000	0,120
1972	0,027	-0,029	0,000	0,473	0,000	0,111
1973	0,031	-0,027	0,000	0,424	0,000	0,101
1974	0,024	-0,024	0,000	0,381	0,000	0,091
1975	0,026	-0,022	0,000	0,318	0,000	0,074
1976	0,016	-0,020	0,000	0,285	0,000	0,064
1977	0,028	-0,024	0,000	0,283	0,000	0,065
1978	0,013	-0,029	0,000	0,278	0,000	0,059
1979	0,003	-0,035	0,000	0,273	0,000	0,059
1980	0,007	-0,043	0,000	0,269	0,000	0,054
1981	0,032	-0,052	0,000	0,272	0,000	0,050
1982	0,033	-0,062	0,000	0,255	0,000	0,048
1983	0,029	-0,075	0,000	0,245	0,000	0,049
1984	0,019	-0,091	0,000	0,238	0,000	0,048
1985	0,015	-0,110	0,000	0,235	0,000	0,045
1986	-0,009	-0,066	0,000	0,230	0,000	0,047
1987	-0,009	-0,026	0,000	0,227	0,000	0,047
1988	-0,007	0,013	0,000	0,224	0,000	0,047
1989	-0,034	0,033	0,000	0,199	0,000	0,041
1990	-0,018	0,036	0,000	0,162	0,000	0,035
1991	-0,002	0,039	0,000	0,145	0,000	0,033
1992	-0,002	0,042	0,000	0,139	0,000	0,032
1993	0,006	0,045	0,000	0,132	0,000	0,030
1994	0,022	0,084	0,018	0,123	0,000	0,021
1995	0,047	0,084	0,018	0,123	0,000	0,021
1996	0,022	0,084	0,018	0,123	0,000	0,021
1997	0,009	0,084	0,018	0,128	0,000	0,022
1998	0,038	0,077	0,018	0,138	0,000	0,023
1999	0,036	0,077	0,018	0,137	0,000	0,021
2000	0,035	0,080	0,018	0,122	0,000	0,019
2001	0,004	0,080	0,018	0,116	0,000	0,017
2002	0,139	-0,050	-0,150	0,104	0,000	0,010
2003	0,093	-0,050	-0,150	0,104	0,000	0,011
2004	0,105	-0,050	-0,150	0,103	0,000	0,01
2005	0,092	-0,050	-0,150	0,103	0,000	0,010

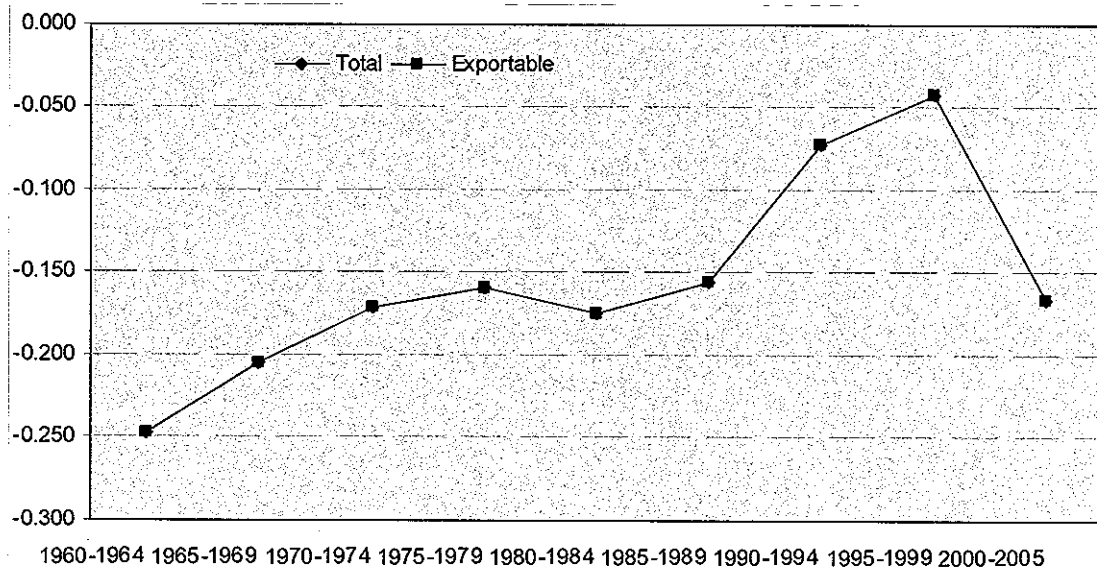
Table 9: Total Rate of Assistance to Agriculture (TNA), Relative Assistance Index for primary agriculture (RAIf), Anti-trade Bias Index among primary ag. Goods (ABIf) and Anti-trade Bias Index among lightly proc. ag. Goods (ABIp)) (1960 to 2005)

	TRA	RAIf	ABIf (a)	ABIp (b)
1960	-0,570	-0,596	0,492	-0,035
1961	-0,532	-0,571	0,428	-0,036
1962	-0,499	-0,550	0,378	-0,039
1963	-0,440	-0,512	0,287	-0,035
1964	-0,332	-0,434	0,121	-0,021
1965	-0,412	-0,504	0,290	-0,031
1966	-0,332	-0,428	0,133	-0,022
1967	-0,462	-0,513	0,345	-0,034
1968	-0,450	-0,517	0,378	-0,034
1969	-0,295	-0,423	0,174	-0,035
1970	-0,259	-0,389	0,146	-0,022
1971	-0,194	-0,330	0,080	-0,012
1972	-0,289	-0,389	0,217	-0,027
1973	-0,325	-0,409	0,288	-0,031
1974	-0,342	-0,416	0,336	-0,025
1975	-0,325	-0,397	0,335	-0,033
1976	-0,288	-0,358	0,287	-0,017
1977	-0,222	-0,302	0,186	-0,028
1978	-0,171	-0,260	0,126	-0,013
1979	-0,112	-0,208	0,056	-0,003
1980	-0,114	-0,210	0,063	-0,007
1981	-0,249	-0,327	0,248	-0,032
1982	-0,260	-0,329	0,270	-0,032
1983	-0,271	-0,333	0,285	-0,028
1984	-0,230	-0,297	0,222	-0,019
1985	-0,242	-0,307	0,246	-0,016
1986	-0,218	-0,286	0,208	0,009
1987	-0,160	-0,237	0,127	0,009
1988	-0,129	-0,212	0,089	0,007
1989	-0,252	-0,312	0,268	0,037
1990	-0,274	-0,321	0,314	0,018
1991	-0,100	-0,161	0,071	0,002
1992	-0,065	-0,128	0,035	0,002
1993	-0,027	-0,092	-0,003	-0,006
1994	-0,049	-0,121	0,02829	-0,02148
1995	-0,059	-0,130	0,03974	-0,04508
1996	-0,055	-0,122	0,03510	-0,02173
1997	-0,057	-0,123	0,03676	-0,00900
1998	-0,077	-0,150	0,05714	-0,03686
1999	-0,072	-0,143	0,05320	-0,03496
2000	-0,071	-0,134	0,05415	-0,03413
2001	-0,040	-0,102	0,02406	-0,00397
2002	-0,244	-0,258	0,30502	-0,12180
2003	-0,237	-0,251	0,29117	-0,08516
2004	-0,241	-0,257	0,29749	-0,09502
2005	-0,243	-0,258	0,30388	-0,08447

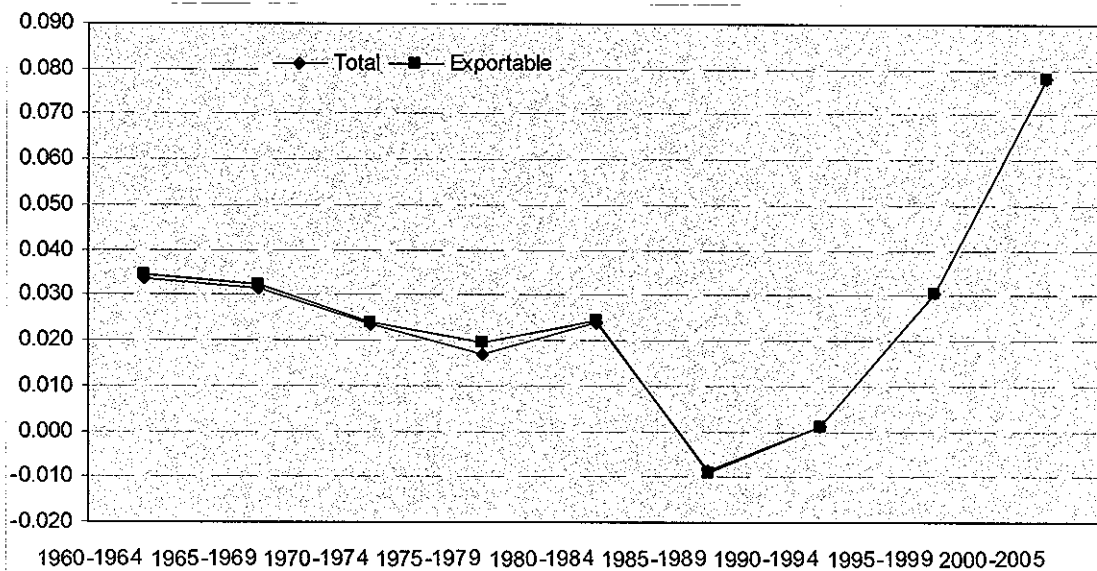
Template figures and tables for summarizing distortions estimates

Figure A4: DRAs by trade status, Argentina, 1960 to 2005

(a) DRAs for primary agriculture



(b) DRAs for lightly processed food



Source: Author's spreadsheet using methodology from Anderson et.al. (2006)

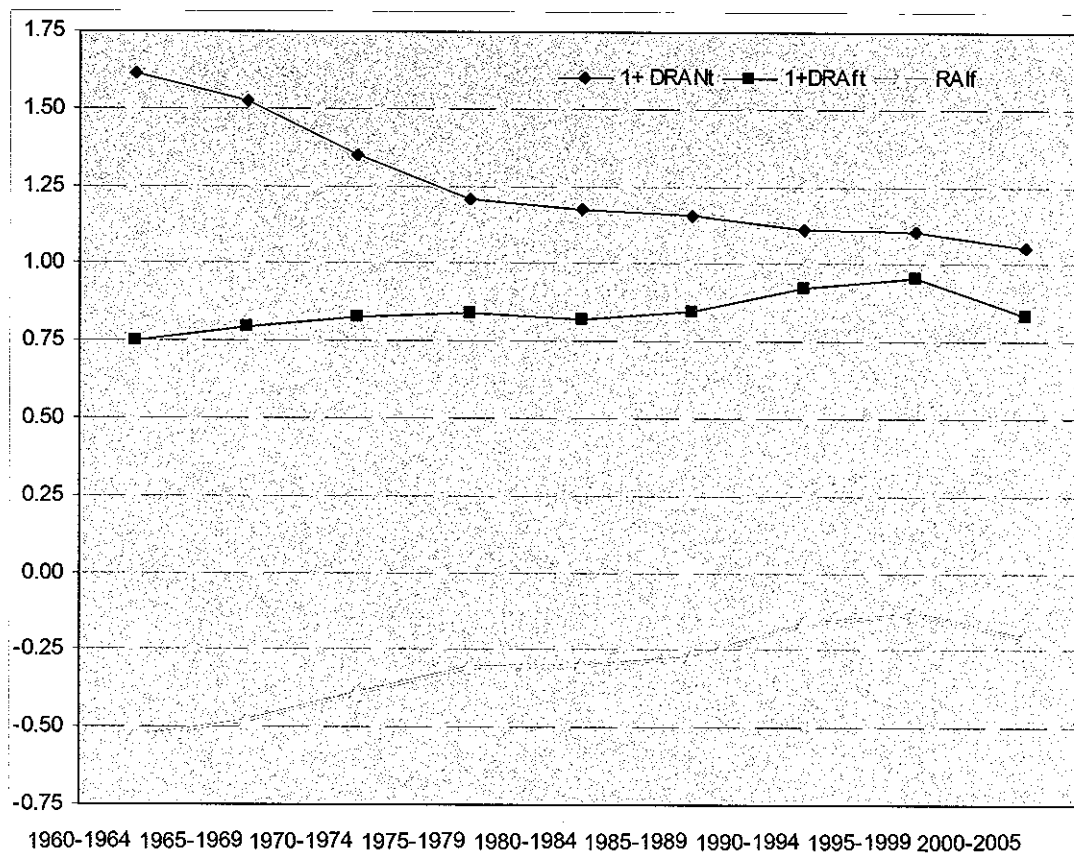
Figure A5: Relative Assistance to primary agriculture Index, RAI_t 

Figure A6: CTEs for primary and lightly processed food

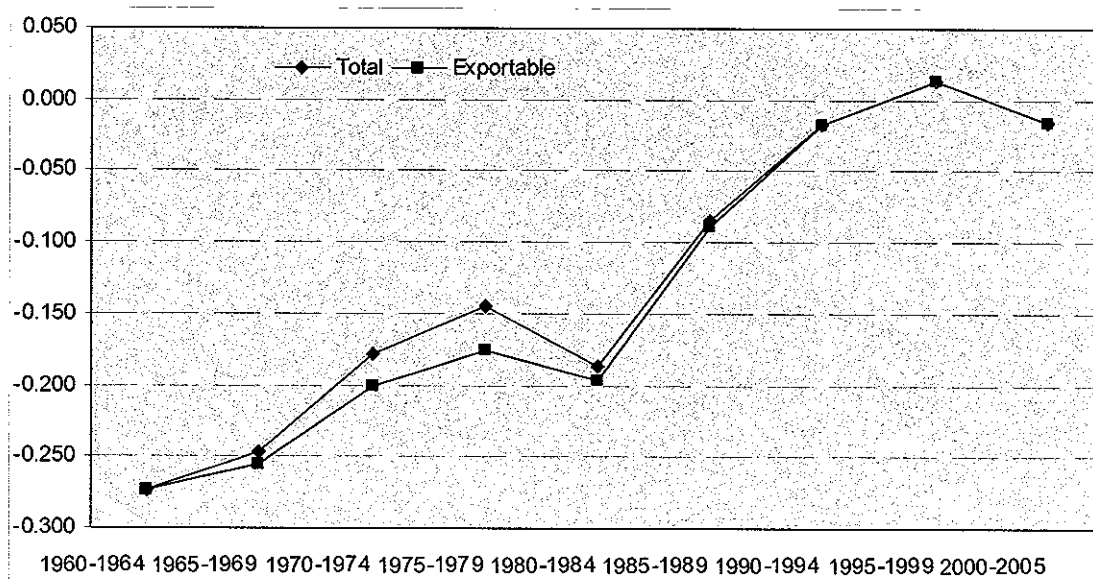


Figure A7: DRAs by commodity, Argentina, 2000-2005

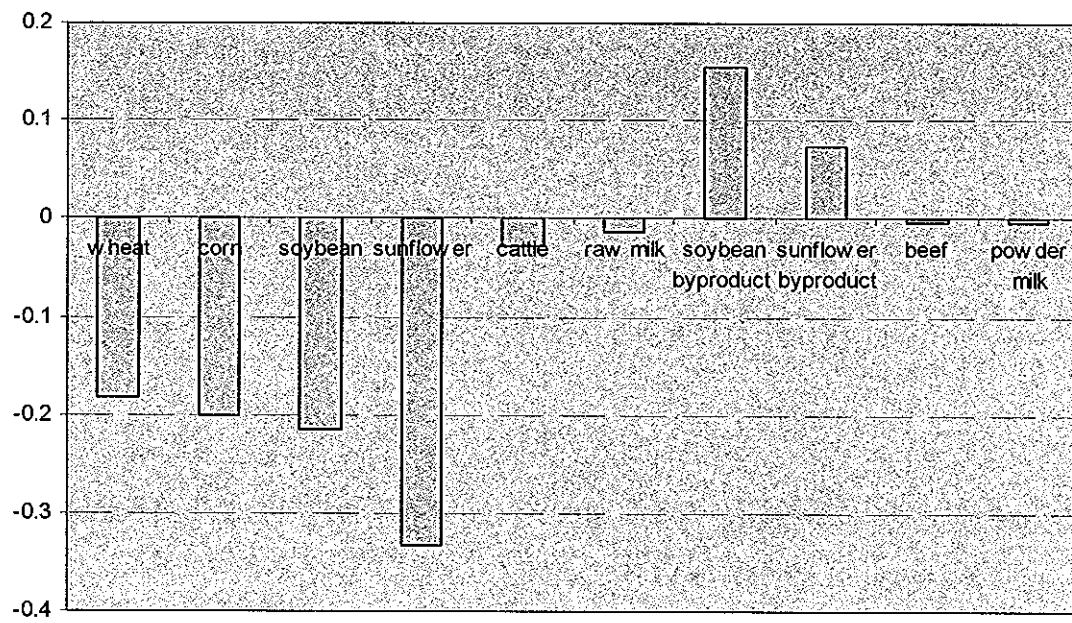


Table A1: DRAs by commodity and TRA for agriculture, Argentina, 1960 to 2006.

	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2005
Covered Products									
DRA									
Exportables									
1) wheat	-0,188	-0,116	-0,325	-0,233	-0,149	-0,170	-0,097	-0,094	-0,182
2) corn	-0,091	-0,119	-0,237	-0,290	-0,146	-0,220	-0,073	-0,052	-0,200
3) soybean	-	-	-	-0,145	-0,171	-0,266	-0,138	-0,074	-0,215
4) sunflower	-	-	-	-0,277	-0,235	-0,262	-0,160	-0,197	-0,333
5) cattle	-0,374	-0,351	-0,261	-0,221	-0,265	-0,122	-0,035	0,026	-0,028
6) raw milk	0,000	0,000	0,000	0,000	0,000	-0,005	0,009	0,051	-0,014
Importables	-	-	-	-	-	-	-	-	-
Non tradables	-	-	-	-	-	-	-	-	-
Weighted Average DRA	-0,277	-0,226	-0,182	-0,172	-0,190	-0,177	-0,085	-0,054	-0,175
Non covered products									
Exportables									
DRA guessestimate	-0,146	-0,132	-0,134	-0,117	-0,119	-0,081	-0,031	0,000	-0,133
Weighted Average DRA	-0,146	-0,132	-0,134	-0,117	-0,119	-0,081	-0,031	0,000	-0,133
DRA a	-0,247	-0,204	-0,171	-0,159	-0,173	-0,153	-0,073	-0,042	-0,166
DRA na	0,228	0,186	0,111	0,064	0,050	0,045	0,030	0,022	0,013
TRA	-0,475	-0,390	-0,282	-0,223	-0,224	-0,200	-0,103	-0,064	-0,179

Table A2: Relative agricultural assistance index (RAIf) and anti trade indexes for primary agriculture and lightly processed food (ATIf and ATIp), Argentina, 1960 to 2006.

	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2005
DRAIf	-0.247	-0.204	-0.171	-0.159	-0.175	-0.155	-0.073	-0.042	-0.166
DRANt	0.614	0.523	0.351	0.211	0.177	0.158	0.110	0.105	0.053
RAIf	-0.533	-0.477	-0.387	-0.305	-0.299	-0.271	-0.164	-0.134	-0.210
DRAfn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DRAfx	-0.247	-0.204	-0.171	-0.159	-0.175	-0.155	-0.073	-0.042	-0.166
ABIf	0.341	0.264	0.213	0.198	0.217	0.187	0.089	0.044	0.213
DRAPn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DRAPx	0.034	0.032	0.023	0.017	0.025	-0.009	0.001	0.031	0.078
ABIp	-0.033	-0.031	-0.023	-0.019	-0.025	0.009	-0.001	-0.030	-0.071

Appendix: Key quantity and price data, assumptions and sources

Quantity data for agricultural products and lightly processed foods

Production volume data are from Agricultural Secretary (SAGPYA)

Export and import and volume data are from Agricultural Secretary (SAGPYA)

Apparent consumptions are from SAGPYA Agricultural Secretary (SAGPYA)

Farm-gate product prices are from KSV study and Surveillance work for 1960 to 1994 and from author's estimation based on information obtained from *Margenes Agropecuarios* journal for 1994 to 2005.

Wholesale product prices

Primary products are from KSV study and Surveillance work for 1960 to 1994 and from author's estimation based on information obtained from *Margenes Agropecuarios* journal for 1994 to 2005.

Lightly processed products are from Agricultural Secretary and Journal *Margenes Agropecuarios*

Margins are based on Journal *Margenes Agropecuarios*

Intermediate input prices and input-output value coefficients

Border prices

FOB prices are calculated from KSV study and Surveillance work for 1960 to 1994 and from author's estimation based on information obtained from *Margenes Agropecuarios* journal for 1994 to 2005. For Cattle and Raw Milk the information was obtained from Agricultural Secretary.

Exchange rates

Official exchange rate is from Ministry of Economics and from the Central Bank of Argentina. Tradable exchange rate and parallel exchange rate information were taken from Techint Magazine and Central Bank of Argentina Year Books.

Production, consumption, input and trade taxes and subsidies are from Agricultural Secretary (SAGPYA) (2006), Ministry of Economy of Argentina (MECON), Bolsa de cereales de Rosario, Cámara de la Industria Aceitera de la República Argentina (CIARA), Journal Márgenes Agropecuarios and J.J. Hinrichsen S.A. and Guía Práctica de Comercio Exterior Year Books.

Buenos Aires,

07 de Marzo de 2007

Instituto Nacional de Tecnología Agropecuaria,

Daniel Lema,

S/D

Te hago llegar este trabajo sobre *Distorsiones a los Incentivos Agrícolas en Argentina* que, junto a M. Salazni, preparamos para el Banco Mundial, a publicarse como working paper del Banco.

Saludos,

Adolfo