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ANALYSIS OF AGRICULTURAL POLICIES IN ARGENTINA 2007-2016

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SUMMARY

This report analyzes agricultural policy in Argentina, in particular with respect to the degree of support producers and consumers receive. For context, the report first presents a summary of developments in the agricultural policy environment that have occurred in recent decades, as well as the resulting performance of the agricultural sector. Available evidence suggests that: (i) as a result of export taxes, in most periods, domestic agricultural output prices have been lower than international prices; (ii) despite the previous finding, Argentine agriculture has shown a remarkable capacity for productivity and output growth; and (iii) since the 2016 crop year, significant changes in the agricultural policy environment have taken place. In particular, President Macri's administration, inaugurated in December 2015, eliminated export taxes for most activities (with the exception of soybeans, for which taxes where reduced), eliminated export permits, and unified the foreign exchange market. As a result of these measures, transfers from the agricultural sector to the rest of the economy were reduced to one-third to one-half of previous values.

The analysis of available data also shows that significant changes are occurring in aspects such as farm size and in the linkages between production, input supply, and the output processing sector.

The report then presents a detailed analysis of support measures aimed at consumers and producers. The concepts of Producer Support Estimate, Consumer Support Estimate, General Services Support Estimate, Producer Nominal Assistance Coefficient, and Nominal Protection Coefficient are used to analyze different dimensions of transfers occurring between agricultural producers, consumers, and taxpayers.

Hence, the analysis using the concepts mentioned above covers the 2007-2016 decade. During the first nine years of this period (2007-2015), agricultural policies resulted in significant export taxes for the principal sector activities. In absolute numbers, total transfers from producers averaged some US$12 billion annually in the 2007-2016 period. These transfers represent some 30 percent of total gross farm receipts. Grains and beef received the highest (negative) support in comparison to milk, poultry, and pork production.

The report also analyzes the support the public sector provided to producers in the form of funding for agricultural research, infrastructure, and other "public good" type of investments. These transfers amounted to some US$500 million annually in the period analyzed, or approximately 5 percent of the total transfers (export duties on agricultural products) flowing from producers to consumers and in the form of tax revenue. The evolution of these transfers over time, as well as their composition and impact, deserves additional attention from policy-oriented researchers.

ACRONYMS

AACREA | Asociación Argentina de Grupos CREA

AAPRESID | Asociación Argentina de Productores de Siembra directa

AAPP | Asociación Argentina de Producción Porcina

ACSOJA | Asociación de la Cadena de la Soja Argentina

ARGENTRIGO | Asociación Argentina de Trigo

ASA | Asociación de Semilleros Argentinos

ASAGIR | Asociación argentina de Girasol

BCBA | Bolsa de Cereales de Buenos Aires

BCR | Bolsa de Comercio de Rosario

CREA | Consorcio Regional de Experimentación Agrícola

FAS | Free Along-Side

FOB | Free On-Board

INDEC | Instituto Nacional de Estadísticas y Censos

INTA | Instituto Nacional de Tecnología Agropecuaria

MAIZAR | Asociación de Maíz y Sorgo Argentino

ONCCA | Oficina Nacional de Control Comercial Agropecuario

PROSAP | Programa de Servicios Agrícolas Provinciales

ROE | Registro de Operaciones de Exportación

SAgroind | Secretaría de Gobierno de Agroindustria [1]

SENASA | Servicio Nacional de Sanidad y Calidad Agroalimentaria

TFP | Total Factor Productivity

1. Up to 2015: Ministerio de Agricultura, Ganadería y Pesca (MAGyP). January 2016-September 2018: Ministerio de Agroindustria (MINAGRI). From September 2018: Secretaría de Gobierno de Agroindustria.

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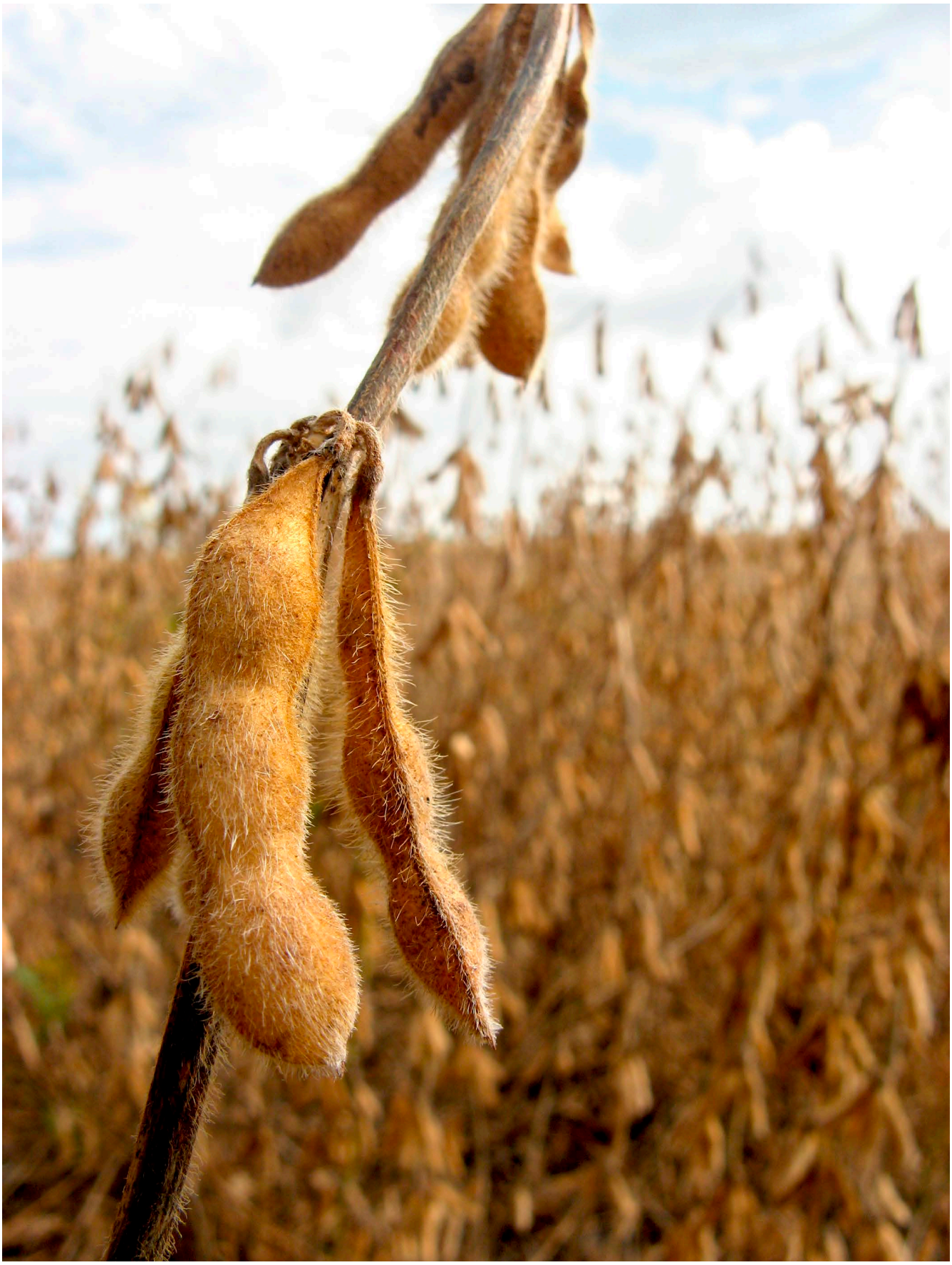
I. INTRODUCTION

This report presents an analysis of policy measures resulting in producer or consumer support in the Argentine agricultural sector for the period 2007-2016. The report will focus on a subset of products of the Argentine agricultural sector: wheat, corn, sunflower, soybeans, beef, pork, poultry, dairy, cotton, and vine (grapes for wine and must). These commodities represent more than three-quarters of the overall value of agricultural production in the country, and more than 85 percent of total agricultural exports. The calculation of the support measures follows the guidelines of the OECD PSE Manual (OECD, 2010) and was supported by the Agrimonitor initiative of the Inter-American Development Bank.

In Argentina, in contrast with most other countries, agriculture is discriminated against. The extent of the "negative protection" has changed over the years, but in general, public policy has decreased the output prices farmers receive and increased the input prices they pay. We can then anticipate that income has been transferred from agriculture to both consumers (through lower prices) as well as to the government (through taxes). Sections II-IV of this report summarize the main aspects of agriculture and agricultural policy in Argentina. Estimates of transfers to and from agriculture are presented in Section V. Conclusions follow in Section VI.

IN ARGENTINA, IN CONTRAST WITH MOST OTHER COUNTRIES, AGRICULTURE IS DISCRIMINATED AGAINST. PUBLIC POLICY HAS DECREASED THE OUTPUT PRICES FARMERS RECEIVE AND INCREASED THE INPUT PRICES THEY PAY



II. AGRICULTURAL POLICY SUMMARY: 1970-2000

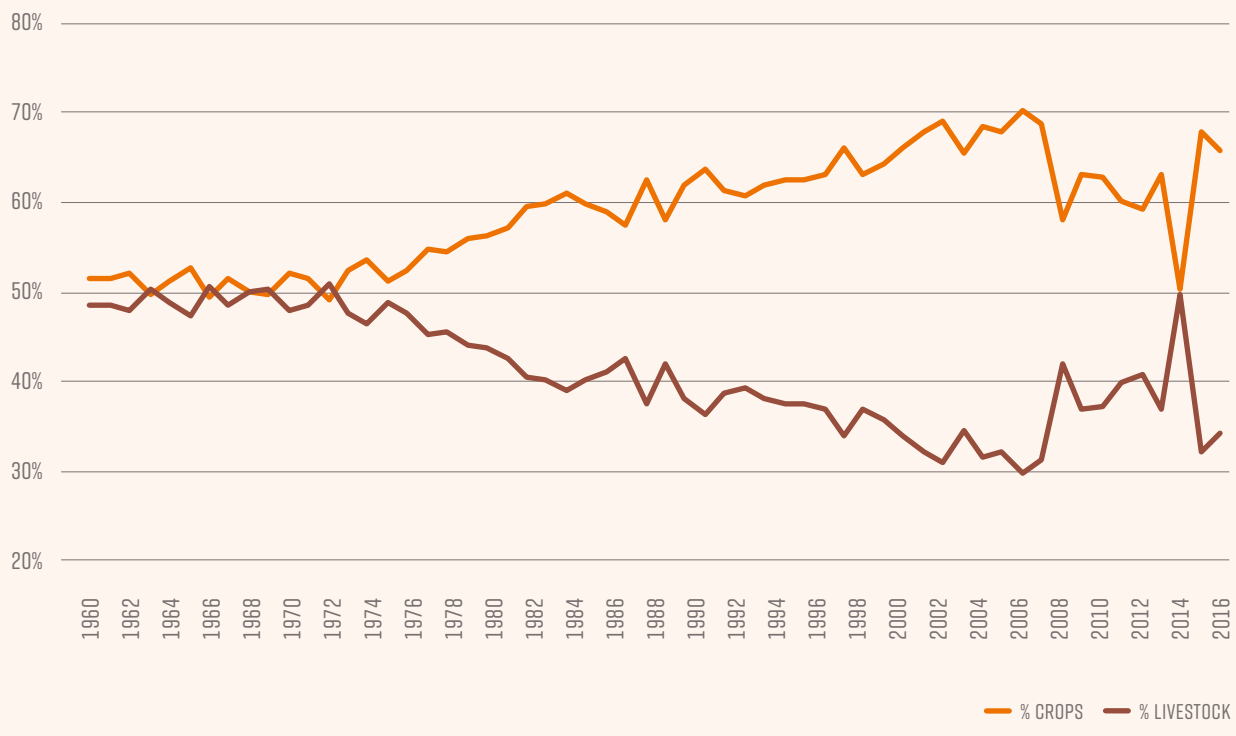
The strategic importance of agriculture in the Argentine economy justifies the special attention directed to agricultural policies and their impacts. The share of agriculture of total GDP is 7.5 percent (World Bank, 2016), but increases to 18-22 percent if indirect contributions are added (including the agro-processing value chain). Agricultural and food products account for 60 percent of the total value of Argentine exports (2017) and agriculture provides direct employment to approximately 7 percent of the labor force. (Ministerio de Hacienda, 2017) According to some estimates (Llach et al., 2004), employment related to agri-food industrial activities represents approximately 35 percent of economy-wide employment.

Historically, Argentina's agricultural output has been composed of approximately 50 percent crops and 50 percent livestock. However, crops have grown faster in recent years and currently make up some 60 to 70 percent of agricultural value added.

A considerably higher proportion of crops compared to livestock output are exported: for example, 80 percent of soybeans and 35 percent of wheat compared to 6 percent of beef, 12 percent of poultry, and 17 percent of milk. A limited number of crops (soybeans, corn, wheat, and sunflower) dominate production volumes and value. What is remarkable is the concentration of production among commodities: approximately one-half of the total crop production and harvested area is devoted to soybeans. Soybeans, virtually unknown in the early 1970s, are now Argentina's main source of foreign currency.

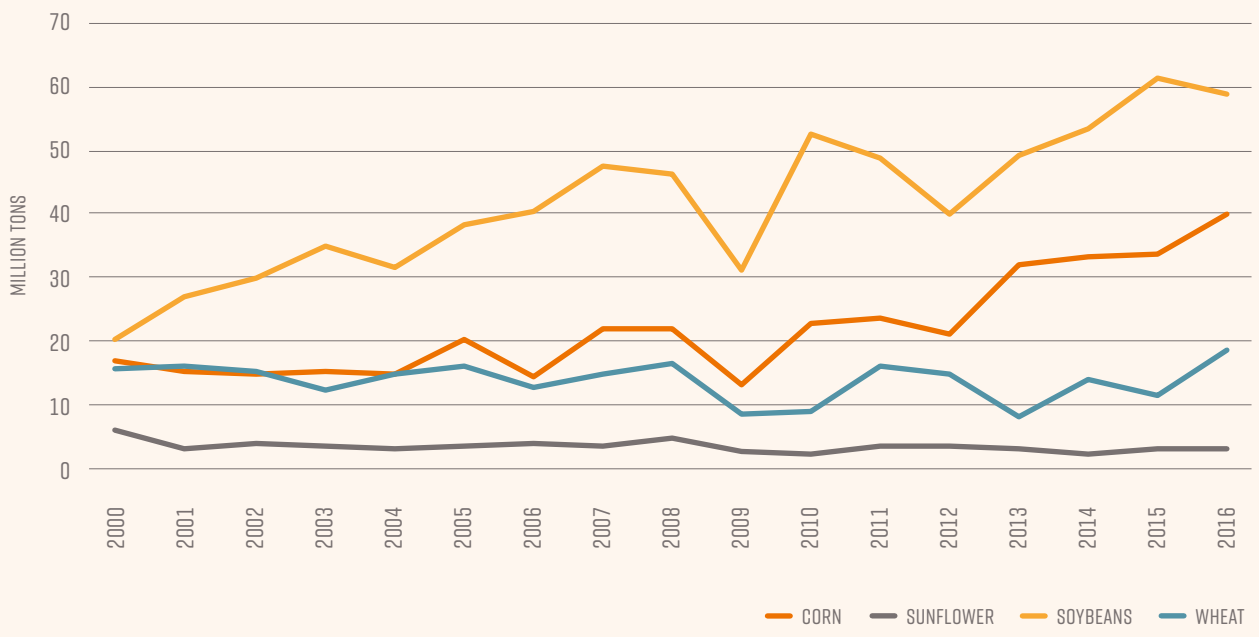
Agricultural production in Argentina takes place in two main areas: the "humid pampas" (the *pradera pampeana* or *pampa húmeda*) and a heterogeneous collection of production areas in the extra-pampean zone. The *pampa húmeda* provides more

FIGURE 1: AGRICULTURAL VALUE ADDED, % OF CROPS AND LIVESTOCK



Source: Own elaboration based from INDEC-National Accounts.

FIGURE 2: MAIN CROPS OUTPUT (MILLION TONS) 2000-2016



Source: Minagri.

than 85 percent of the output of the commodities analyzed in this report. Five of the ten commodities analyzed here (corn, soybeans, wheat, sunflower, and beef) are produced mostly in medium to quite large production units (i.e., 500-1500 hectares), most of which are located in the *pampa húmeda*. In contrast, in the case of milk, producers with fewer than 500 hectares predominate. Poultry, and to a lesser extent pork, production also takes place in this region, but in large, "industrial"-type units.

The *pampa húmeda* is characterized by highly commercial and dynamic firms. A substantial portion of these operate quite profitably, and in some cases grow over time. The technology in use is similar to that found in the agricultural sectors of developed economies such as the United States, Canada, and Australia. Indeed, the fact that the *pampa húmeda* is located in a temperate climate area allows production technologies developed in northern countries-for example, in the US corn and wheat belt-to be transferred to Argentina with little need for adaptation.

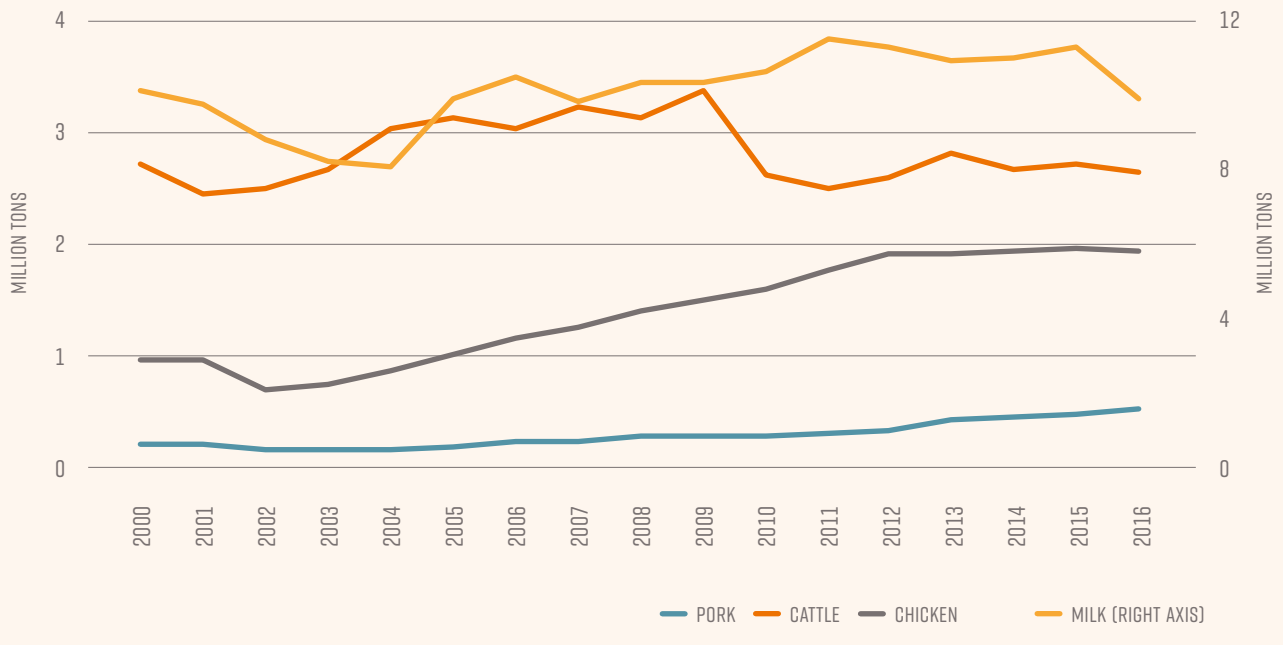
The extra-pampean areas, in contrast, host a heterogeneous collection of agricultural activities including the cultivation of grains (soybeans being increasingly important), fruits, and horticultural products. Rural poverty is significant in many regions of the non-pampean zone, contrasting with the pampa húmeda,

where rural poverty is a relatively localized problem (World Bank, 2010). In the extra-pampean region, state-of-the-art production systems coexist with small and barely profitable production units. As an example of the former, pear and apple production for export in the Río Negro province is carried out in large, vertically integrated firms, some controlled by multinational corporations specializing in the complex operations of international fresh fruit markets. Extra-pampean areas face higher transport costs, less-developed input and agricultural service markets, and a less vigorous availability of new technology. In these areas, constraints to production (rainfall, heat, pests, soils) can in some cases be quite severe.

Since 1970, the Argentine agricultural sector has boasted significant growth, contrasting sharply with the poor performance of the non-agricultural economy for most of the period. The sector is extremely responsive to economic incentives and the performance of Argentine agriculture compares favorably not only with other sectors of the economy, but also with the agricultural sector of other major world exporters and producers (Lence, 2010).

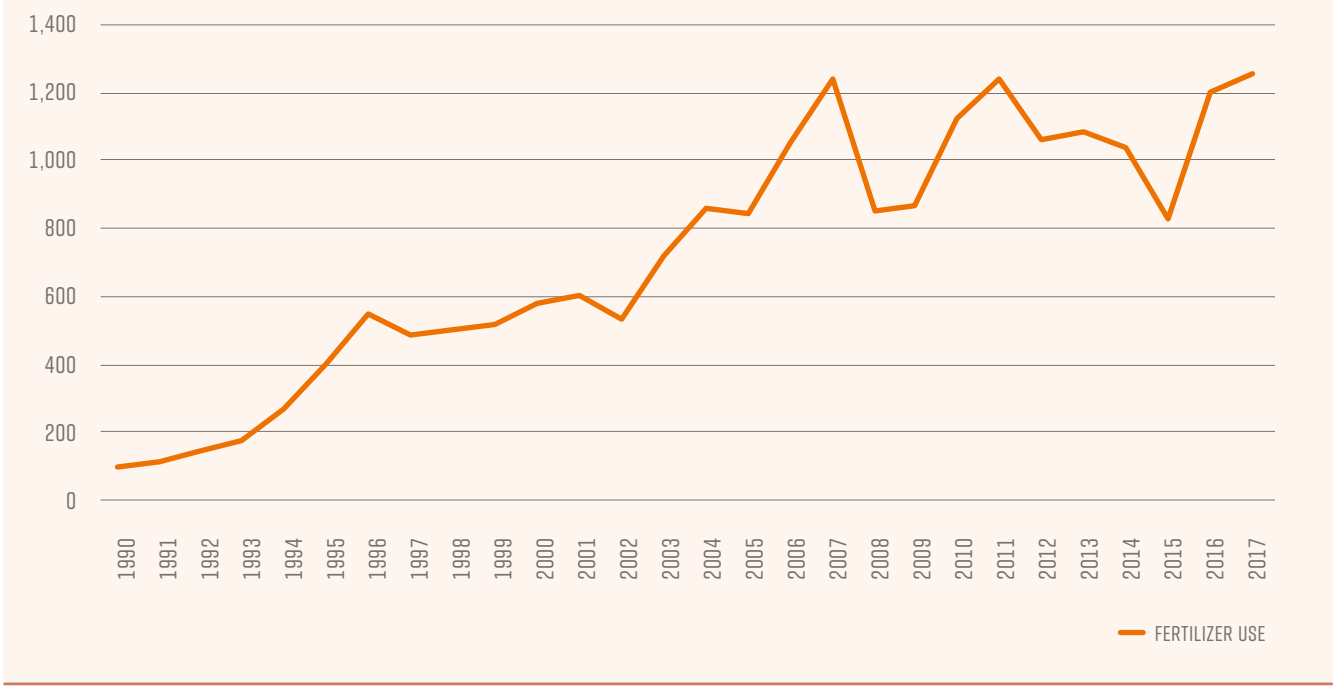
Technical change has played a substantial role in output growth (see e.g., Reca, Lema, and Flood, 2010; Nin Pratt et al., 2015).

FIGURE 3: ANIMAL PRODUCTS OUTPUT (MILLION TONS) 2000-2016



Source: Minagri.

FIGURE 4: ARGENTINA. FERTILIZER USE (INDEX 1990=100)



Source: Author´s compilation based on www.fertilizar.org.ar

Changing crop productivity and changes in input/output price ratios have resulted in dramatic shifts in resource use in agriculture. As an example of the above, until the 1970s, fertilizer use in extensive crop production was practically non-existent. Its use started slowly in the 1980s and, "gathering speed" in the 1990s, increased continuously. By the 2010s, total use reached nearly three million tons.

Part of the increase can be explained by changing relative prices: the elimination of export taxes on grains and import taxes on fertilizers resulted in lower input/output price ratios in the 1990s compared to the 1970s. However, other factors also played an important role: in particular, and as discussed below, technical change increased the resource productivity of (and hence demand for) inputs such as fertilizers and herbicides.

The increased response to fertilizers in new as compared to previous seeds played a part in the growth of fertilizer use. As shown in Table 1, since the early 1980s, total grain output tripled. The growth of animal product output, while generally more modest, was nevertheless substantial: beef increased by 18 percent and milk by 70 percent. Poultry production growth, however, was

even higher than the growth in grain output (output in 2005-09 was nearly four times higher than in 1980-85). Poultry production —in contrast to most other agricultural products— does not use significant quantities of land and thus can be expanded without a corresponding decrease in area planted with crops or allocated to pastures. Although on a more modest scale than in the case of poultry, in recent years beef and dairy production have also adopted "intensive" production systems that allow increased output per unit of land: feedlots in the case of beef and supplemental feeding with concentrates in the case of dairy. These developments are the result of increased competition for land resulting from the increased profitability of traditional grain crops.

TABLE 1: OUTPUT AND PLANTED AREA

OUTPUT GRAINS		1985-89	1995-99	2005-09	2010-16
RICE	´000 TONS	422	1,153	1,218	1,604
CORN	´000 TONS	8,170	15,140	18,803	28,804
WHEAT	´000 TONS	8,988	13,581	11,871	9,796
PEANUTS	´000 TONS	262	426	558	918
SUNFLOWER	´000 TONS	3,263	5,960	3,328	3,068
SOYBEANS	´000 TONS	8,180	16,464	43,586	50,616
COTTON	´000 TONS	541	1,021	458	789
VINEVITICULTURE	´000 TONS	2,854	2,301	2,651	2,579
TOTAL OUTPUT GRAINS	**INDEX**	**100**	**182**	**300**	**348**
PLANTED AREA GRAINS					
(6 MOST IMPORTANT)	´000000 HAS	14.9	20.7	27.7	30.8
OUTPUT ANIMAL PRODUCTS					
BEEF	´000 TONS	2,702	2,657	3,180	2,643
CHICKEN	´000 TONS	336	827	1,263	1,827
MILK	´000 TONS	6,073	9,555	10,182	10,967

Source: SAGPyA (hectares and output).

The 1970-2000 period comprises two sub-periods. The first covers 1970-1990 and is characterized by (i) taxes on exports and imports of agricultural inputs such as fertilizer and (ii) low levels of investment in private agricultural R&D as well as in general infrastructure. The second sub-period corresponds to the years 1990-2000. The period starts with the macroeconomic reform program implemented in 1990, an important turning point for the agricultural sector. The 1990-2001 period was characterized by the absence of export and import taxes, a stable currency exchange rate (the convertibility program fixed the US dollar-Argentine peso ratio at 1:1), and the privatization of port terminals and storage facilities, as well as a market-friendly environment for foreign investment. Fernando Sonnet (1999) points out that price stabilization, the reduction of barriers to trade, privatization, and deregulation resulted in substantial changes in the economic environment producers faced.

In a quantitative analysis of changes occurring in recent decades, Lema (2010 and 2016) decomposes output growth (1968-2008) into that accounted for by conventional inputs (land input allocated to crops, capital inputs, fertilizers, labor) and an "unexplained residual." Conventional inputs account for no more than one-third of the observed growth in output, leaving the other two-thirds to "technical change"; that is, an upward shift in the production function for agriculture. Lema finds that Total Factor Productivity (an approximation of technical change) increased 2.4 percent annually in the 1968-2008 period. During the 1990s, the increase was even higher (4.4 percent annually), giving support to the thesis that pro-market reforms undertaken in this period had a positive impact on agricultural efficiency.

III. AGRICULTURAL POLICY SUMMARY: 2000-2015

A. OVERVIEW

In this period, sector developments were simultaneously impacted by the cycle of high commodity prices and highly trade-distorting agricultural policies. **Since 2003, Argentina has benefited from favorable relative prices in international commodity markets.** This initially caused an expansion in agricultural production, specifically in extensive crop production.

However, policies applied in the 2002–2015 period resulted in high tax pressure on the sector, which impacted agricultural profitability towards the end of the period (Lema, 2016). The combination of taxes and export quotas on the primary agricultural and livestock products and foreign exchange controls had a substantial impact on agricultural producers' incomes and reduced incentives for investment and technology adoption. Argentine crop and livestock productivity has experienced weak growth since 2008, which contrasts with the dynamic behavior of other countries in the Latin American region. Rising international prices and new technologies, along with favorable weather, counteracted for some years the adverse impact of taxes and other restrictions on exports and the overvaluation of the local currency.

ARGENTINE CROP AND LIVESTOCK PRODUCTIVITY HAS EXPERIENCED WEAK GROWTH SINCE 2008, WHICH CONTRASTS WITH THE DYNAMIC BEHAVIOR OF OTHER COUNTRIES IN THE LATIN AMERICAN REGION

The macroeconomic crisis Argentina suffered in late 2001 resulted in substantial changes in the agricultural policy environment. Starting in 2002, most of the policy measures of the 1990s were progressively reversed with the result that, as of late 2013, (i) commodity producers faced export taxes ranging between 20 and 35 percent, (ii) import taxes had been reinstated for capital items, (iii) monetary policy had resulted in increasing inflation, averaging 20–25 percent in 2013, and (iv) the agricultural value chain was subject to increasing regulation, in particular through export quotas for some commodities as well as price ceilings at the retail level. Changes in the labor market resulting from the macroeconomic recovery beginning in 2002 as well as unemployment subsidies and increasing labor regulation resulted in increasing prices for agricultural labor services. Despite unfavorable policy developments after 2001, output growth continued: the production index of the six most important crops increased by 50 percent between 1995–99 and 2005–09 (See Table 1).

Post-2002, export taxes on agricultural products represented a high and increasing source of tax revenue.[2] From 2008 until the end of 2015, the export duties (*ad valorem*) on soybeans, wheat, and corn were 35, 23, and 20 percent respectively; these values are exceptionally high from an international perspective. In a recent paper, Julio Nogués (2015) estimates that in 2008, US$11 billion was collected through export duties on the agro-industrial chain.

2. In 1991, export duties for agricultural products were eliminated. In 2002, export duties were re-introduced for most agricultural products. Initial ad valorem values were 30 percent for soybeans and 10 percent for wheat, corn, and beef.

Reducing the price of basic foodstuffs was a second objective of export taxes. In the case of wheat, in 2002, export duties were imposed initially at 10 percent, increasing to 23 percent in 2005. Further export restrictions in the form of quotas for wheat were imposed in 2008. The idea behind the quotas was to guarantee a surplus over domestic consumption–after estimating consumption, authorities issued export permits for the surplus. However, production was often over- or underestimated and export quotas were allocated on a discretionary basis. This introduced uncertainty in transactions and drove producer prices down (in addition to the effect of export taxes). These lower prices led to lower production in the following years. As a result, wheat production in 2013 was only 8 million tons (domestic consumption is on average 6–7 million tons) and the area planted with wheat was one of the smallest in the recent history of Argentina.

Compared to developed countries (e.g., the United States, Canada, or European nations), agricultural policy in Argentina has resulted in few programs or regulations focused specifically on the supply or demand of primary products. For example, no "food stamp" programs exist in Argentina, even though many observers feel that this type of program would be an efficient way to protect low-income households from food price increases. Similarly, price support programs–important in some developed economies–have been of only marginal importance in Argentina.

Agricultural insurance in Argentina is provided by private firms operating without public subsidies —a situation that contrasts with most developed economies, where farmers pay less than one-half or even one-third of what would be an "actuarially fair" premium. Further, farmers face considerable price risk: futures markets in Argentina (because of increasing inflation as well as uncertainty over export taxes) channel a low proportion of total output. For price forecasts, farmers have to rely on US or European futures markets with a corresponding "basis" risk resulting from the imperfect correlation between prices in these markets and those in the markets in which these farmers operate.

FARMERS FACE CONSIDERABLE PRICE RISK: FUTURES MARKETS IN ARGENTINA CHANNEL A LOW PROPORTION OF TOTAL OUTPUT

B. INTERVENTION IN DOMESTIC MARKETS

Export taxes —reinstated after 2002— have been by far the most important public intervention in agricultural markets in Argentina. Additional measures are discussed below.

The Oficina Nacional de Control Comercial Agropecuario (ONCCA), created by national decree in 1996, had the stated objective of contributing to the "transparency" and "efficient operation" of agricultural markets in the country (InfoLeg, 1996).Until late 2010 (when its functions were transferred to other government units), it carried out its mandate by registering commercial operations, publishing reference prices, administering payments to producers and processors, administering European Union export quotas (the "Hilton" export quota for high-quality beef), and authorizing firms to participate in markets (U.S.Meat export Federation [undated]) The ONCCA also had a mandate to gather and administer market information. Beginning in 2008, ONCCA's registry and data gathering functions were expanded to include authorizations for exports of grains, beef, and milk. The "ROE" (*Registro de Operaciones de Exportación* or Registry of Exports) was introduced to track export permits administered by ONCAA. In some periods and for some products, demand for permits exceeded supply (i.e., export quotas were effective).

Ricardo Passero (2011) shows the proliferation of regulations in grain markets from 2007 to 2010. According to the author's estimates, export quotas for wheat resulted in price decreases of 10–15 percentage points *below* the levels resulting from export taxes alone. For example, in 2007, export taxes were 23 percent; however, the Free Alongside (FAS) price producers received was 35 percent below local Free On Board (FOB) prices. This indicates that quantitative restrictions resulted in an additional 12-percentage-point price drop. The following year, export taxes were 20 percent, but FAS prices received were 37 percent below FOB prices.

As mentioned previously, the rationale for export quotas rests on the argument that in the absence of domestic restriction, supply may be insufficient to cover demand, thus a "deficit" may occur in domestic markets. Further, export quotas also depress domestic prices, a positive impact in particular for local consumers of beef in a country such as Argentina where per-capita meat consumption levels are high. However, the eventual lower prices are transitory and obtained at a high efficiency cost.

The argument that quotas are needed to balance domestic supply and demand neglects to consider that an eventual deficit in the domestic market will result in high prices. For the firm holding

grain stocks, higher prices induce sales in the domestic market. It is important to consider that domestic grain stocks are substitutes for grain imports, thus transport costs of imported grain constitute the lower bound of the price differential obtained by the local grain holder. The existence of potential profits to be obtained by grain merchants from correctly forecasting inter-temporal supply (grain in storage) and demand (domestic consumption) is a strong incentive for adequate grain reserves to be maintained between successive harvest periods, which casts doubt on the desirability and efficiency of government-mandated restrictions on exports.

C. PRICE SUBSIDIES

In 2007, a price subsidy mechanism was put in place for processors selling wheat, corn, soybeans, and sunflower products in the local market. These interventions fell under the responsibility of ONCCA. The per-unit subsidy was calculated as the difference between the market and a domestic "reference" price (*"precio de abastecimiento interno"*). Eligibility for subsidies was reserved for firms that had undertaken operations in the grain market prior to the start of the price compensation scheme. Maximum compensation per firm was calculated on the basis of monthly records of firm operations, net of those channeled to the export market. Subsidy amounts are discussed in a subsequent section of this report.

IN 2007, A PRICE SUBSIDY MECHANISM WAS PUT IN PLACE FOR PROCESSORS SELLING WHEAT, CORN, SOYBEANS, AND SUNFLOWER PRODUCTS IN THE LOCAL MARKET

In the case of wheat, both producers selling to domestic market processors as well as the processors themselves were eligible to receive subsidies. In some cases, subsidy payment was conditional upon processors maintaining prices for their output within established limits.

Beginning in 2008, "small farmers" were also eligible for subsidies. These are defined as producers with total output of less than 500 tons and fewer than 350 hectares in the *pampa húmeda* or 500 hectares in the *zona extra pampeana*. This subsidy attempted to refund smaller producers part of the price reduction resulting from export taxes. The plan, if successful, would have resulted in "differential" export taxes according to farm size. An additional subsidy for grain transport costs was offered to producers in the *zona extra pampeana*, justified by the high transport costs producers in this area faced. Again, the plan can be seen as an attempt at "price discrimination," with the reasoning that export taxes are justified as a way of transferring land rents from the highly productive *pampa húmeda* to other sectors of the economy.[3]

3. Price subsidy schemes abandoned with the administration that began in December 2015.

Subsidies were also paid to livestock producers. Feedlot producers were eligible, with the aim of reducing the cost of production of grain-fed animals. The subsidy was calculated on the basis of an estimate of the quantity of grain used. A "technical conversion" factor of 6 kg of corn to 1 kg of beef was used to calculate the amount of compensation to be paid, with the payment being a function of the total input (corn) usage.

The considerable increase in feedlot production since 2008 has been explained in part as a result of these subsidy payments. Indeed, some observers believe that in the absence of subsidies, beef production under feedlot conditions would have been in most years unprofitable–lower prices for beef in Argentina as compared to, for example, the United States or Australia make grain feeding a marginal proposition unless (i) export taxes exist on grain and not beef, and (ii) some subsidy is applied to feedlots. A point to note is that concurrent with feedlot subsidies, a system of export permits (resulting in some cases in *de facto* quotas) were imposed on beef exports. The aim of these measures was to reduce beef prices in the domestic market. With variations, similar subsidy schemes have been in effect for pork and poultry production.

In the case of dairy, subsidies on the order of US$0.015 per liter (or 5 percent of the milk price) were paid in 2007 and 2008, with a limit of 3,000 liters per day of output. Only farms producing up to 3,000 liters per day were eligible. For a farm producing at this upper limit, the annual subsidy would be US$16,000, or approximately the annual labor cost of 1.5 workers. In 2010, the subsidy was increased to approximately US$0.02 per liter. Subsidies were also directed to milk processors. In this case, eligibility conditions included agreeing to maximum prices for milk products set by the authorities. Dairy processing farms were also subject to export permits administered by the commerce secretary. To be eligible for these permits, farms had to meet price and domestic market output guidelines.

In summary, from 2002 to 2015, public policy generally discriminated against Argentine agriculture. **Domestic price subsidies to producers —when existing— were not sufficiently large or widespread to increase farmer incomes to match the level that would exist in the absence of export taxes.** A cursory reading of program design and administration conditions (eligibility, subsidy calculations) suggests a host of problems that could result from the scheme. Independent of the impact on the efficiency of resource allocation, questions exist about how subsidies were rationed among potential claimants.

DOMESTIC PRICE SUBSIDIES TO PRODUCERS –WHEN EXISTING– WERE NOT SUFFICIENTLY LARGE OR WIDESPREAD TO INCREASE FARMER INCOMES TO MATCH THE LEVEL THAT WOULD EXIST IN THE ABSENCE OF EXPORT TAXES

D. EXCHANGE RATE CONTROL AND INFLATION

Exchange rate controls cause export and import transactions to take place at an exchange rate ($/US$) below the prevailing (formally illegal) free exchange rate. The extent of the resulting distortion is proportional to the wedge between the official and the free exchange rates. The exchange rate wedge $(er_{free} - er_{official})/er_{free}$ was less than 2 percent in early 2010 but subsequently reached levels between 50–60 percent. For example, the wedge was 60 percent, 54 percent, and 56 percent in 2013, 2014, and 2015 respectively. Exchange rate controls result in transfers from the exporting sector to the rest of the economy: the exporter receives a price (in export currency) for the product that is lower than what they would receive in the absence of these controls. This situation implies that, in the 2013–2014 period, the combination of export taxes plus exchange rate controls resulted in domestic prices equivalent to 40 percent (soybeans), 55 percent (corn and wheat), and 60 percent (beef) of international prices.

Exchange rate controls not only reduce prices for exports, but also for tradable inputs agricultural producers use: if importers can access foreign currency at the official rate, import prices will be lower than those existing without exchange rate controls. If all inputs used by agricultural producers were tradable, and no quantitative restrictions were operative, relative input/output prices would not be affected by exchange rate control policy, as both are affected the same way. However, labor and management are non-tradable goods, thus the reduction of output prices resulting from exchange rate controls increases the relative prices of these inputs. Moreover, transaction costs (transport, brokerage, financing) likely contribute to making most other agricultural inputs not "perfectly" tradable; thus, lower output prices resulting from exchange rate controls probably also increase relative prices for these inputs as well. Overall, exchange rate controls result in a net income loss for the exporting sector and a net gain for other sectors of the economy.

Accurate figures on inflation are hard to find due to the tampering with official price indices that was ongoing in the 2007–2015 period. However, for the 2010–2015 period, private sources reported annual inflation levels of 25 to 35 percent (Inflación Verdadera [undated]). These inflation rates are probably not neutral with respect to agricultural production. Among other effects, inflation severely hampers the operation of futures markets. The absence of futures markets results in increased difficulty in predicting

OVERALL, EXCHANGE RATE CONTROLS RESULT IN A NET INCOME LOSS FOR THE EXPORTING SECTOR AND A NET GAIN FOR OTHER SECTORS OF THE ECONOMY

prices, and therefore increased uncertainty. Inflation also impairs the functioning of capital markets, resulting in reduced access to credit. High nominal interest rates coupled with high inflation rates effectively result in the shortening of the repayment period of medium-term loans: compared with the benchmark of low nominal rates and low inflation, repayments in the high inflation scenario result (even with identical "real" interest rates) in an anticipation of cash flows, as a greater portion of these flows are represented by interest payments and a smaller portion by repayment of the principal (which in real terms "shrinks" over time). Inflation also results in increased difficulty in price discovery, in particular when legal restrictions prohibit posting prices (or writing contracts) in inflation-free currency.

E. PRODUCTIVITY TRENDS

As mentioned in previous sections, **the available evidence indicates that in the 1960–2008 period, Argentine agriculture experienced significant productivity increases**. A relevant question pertains to whether these increases have been maintained since the early 2000s, a period characterized by, on the one hand, increasing international commodity prices, but on the other, significant market distortions in domestic agricultural markets.

Recent research (Lema, 2016) reveals that the growth rates of crop and livestock production, input use, and Total Factor Productivity (TFP) have been slowing since 2001. For crops, growth in production, input, and TFP was higher from 1990 to 2001 than from 2008 to 2013. Surprisingly, growth was lowest from 2008 to 2013 when the world food price index was at a record high and there was significant global interest in investing in the sector. From 2008 to 2013, after further increases in export taxes and the introduction of export quotas, the average annual growth of TFP settled around the global average of 2 percent per year–markedly lower than in Brazil and Uruguay for the same period. This is also consistent with anecdotal evidence indicating that in searching for investment opportunities, Argentine agribusiness companies allocated know-how and capital to Brazil and Uruguay. It remains to be seen whether or not these reduced levels of TFP growth are the result of policies that strongly discriminated against agriculture in the 2002–2015 period (fundamentally through export taxes and restrictions), or if they are related to factors such as reduced R&D performance in the public and private sectors, increased exposure to climatic risk, or other factors.

The slowdown of productivity growth mentioned above justifies a brief review of agricultural R&D and related activities in Argentina to provide additional insight into the potential for future productivity improvements. Formal R&D activities started in the late 1950s with the creation of the Instituto Nacional de Tecnología Agropecuaria (INTA). This nation-wide, federally funded organization superseded efforts made previously by a dispersed system of provincial research institutes. INTA has made significant contributions to agricultural technology, especially in crop breeding, soil management and fertilization, weed control methods, adaptation to climate variability, and other related aspects. Its R&D budget has increased substantially in recent years, from US$70 million in 2007 to US$180 million in 2016. Budget allocations for activities related to technology transfer (extension) also increased in the 2007–2016 period from US$81 million to US$211 million.

The impact of some current INTA programs, in particular those related to extension services has not been analyzed in detail. This issue is of importance, in particular given that the private sector (consultants, seed companies and other input suppliers, cooperatives) has effective delivery systems for the transfer of agricultural know-how, but documented evidence on the impact of the official transfer system is lacking. This is particularly true in the *pampa húmeda*, where medium and large farm are prevalent.

Over the past decades, private sector involvement in technology transfer and R&D has grown significantly. AACREA (Asociación Argentina de Grupos CREA) is a private organization aimed at improving farm management and adapting technology to local conditions; was created in the late 1950s and currently has some 1800 farmer members. This organization provides significant leadership in agricultural efficiency efforts, not only for its own members, but also in the agricultural sector as a whole. AAPRESID (Asociación Argentina de Productores de Siembra Directa) is another important private organization focused on field-level research and technology transfer, with a particular emphasis on soil conservation and management. AACREA and AAPRESID are two examples of privately-funded organizations that, to an important extent, provide "semi-public" and in some cases "public" goods.

Numerous organizations related to crop and livestock value chains have also emerged: ASAGIR (sunflowers), MAIZAR (corn), ACSOJA (soybeans), ARGENTRIGO (wheat), as well as ASA (seed companies). These organizations carry out lobbying efforts to benefit their associates but also contribute to diffusion of production and in some cases market information.

FOR CROPS, GROWTH IN PRODUCTION, INPUT, AND TFP WAS HIGHER FROM 1990 TO 2001 THAN FROM 2008 TO 2013

The private sector has also made inroads in biotechnology. Bioceres, a firm based in Rosario, has already obtained a genetically modified variety of drought-resistant soybeans via joint ventures with university and public-sector researchers. The firm is also involved in other biotech efforts and has announced its intention to go public in the US capital markets. If this is successful, more ambitious research endeavors can be expected to follow.

During the last two to three decades firms and individuals engaged in agriculture have significantly increased their specialization and professionalization. This is true not only at the individual producer level, but also in backward linkages towards input supply and forward linkages towards product transformation through increasingly diverse marketing channels. Although not as easily measured as the growth in output or fertilizer use, the quality and specialization of human capital allocated to agriculture appears to show a clear upward trend (Gallacher and Lema, 2016 and 2017).

In summary, **increased public resources have been allocated to R&D in the last decade. While no information is available on private sector resource allocation, cursory observation suggests considerable activities of this type. The productivity slowdown that has taken place thus can be hypothetically attributed to incentives facing producers (demand) more than to the supply of technological know-how.** As Yair Mundlak (2000) suggests, modern technologies are more capital-intensive and restrictions or limitations to capital accumulation, as well as price distortions, can determine a lower productivity growth rate. However, prudence is necessary in making inferences on these topics, as the issues raised are complex and causal factors should be carefully assessed.

F. POLICY APPRAISALS PRE-DECEMBER 2015

Concerns over the conduct of agricultural policy in Argentina surfaced in 2008 when an attempt to increase export taxes (and tie future price increases to even higher taxes) sparked widespread opposition in the agricultural sector. After residents in rural areas —not only farmers— severely interrupted road transport in most of the country, the government was forced to back down. The now famous "Resolución 125," an executive decree that incorporated the changes mentioned above, was canceled, and the Minister of Economy was forced to resign.

In 2010, the government implemented the "Strategic Plan for the Agricultural and Livestock and Agro-industrial Sectors" (MAGyP, 2010), which included an ambitious growth projection of 50 percent for grain production between 2010 and 2020. Meeting the Strategic Plan's goal would have required an annual growth rate of 4.5 percent for agricultural production from 2010 until 2020, an ambitious target. In comparison, the observed annual growth rates and projected to 2020 are 1 percent for beef and 3.7 percent for milk, much higher than those observed over the previous years, which were almost insignificant, but still lower than the required to reach the goal of the Strategic Plan.

In June 2011, a significant policy document was published: *"La agroindustria para el desarrollo argentino–aportes para una política de Estado,"* written by four of the secretaries of agriculture holding office since 1983 (Reca et al., 2011). Key factors included in their report are (i) the need for increased attention to public and private investment in agricultural technology, (ii) improvement in the marketing of agricultural products, (iii) the elimination of export taxes, substituted by economy-wide taxes, and (iv) improvement in transport (including rail and waterways). The authors also point out the need to improve the prospects of "family farming" (*agricultura familiar*). For this objective, attention is needed on "rural development" issues such as improvements in rural roads, schooling, health services, communications, and access to electricity.

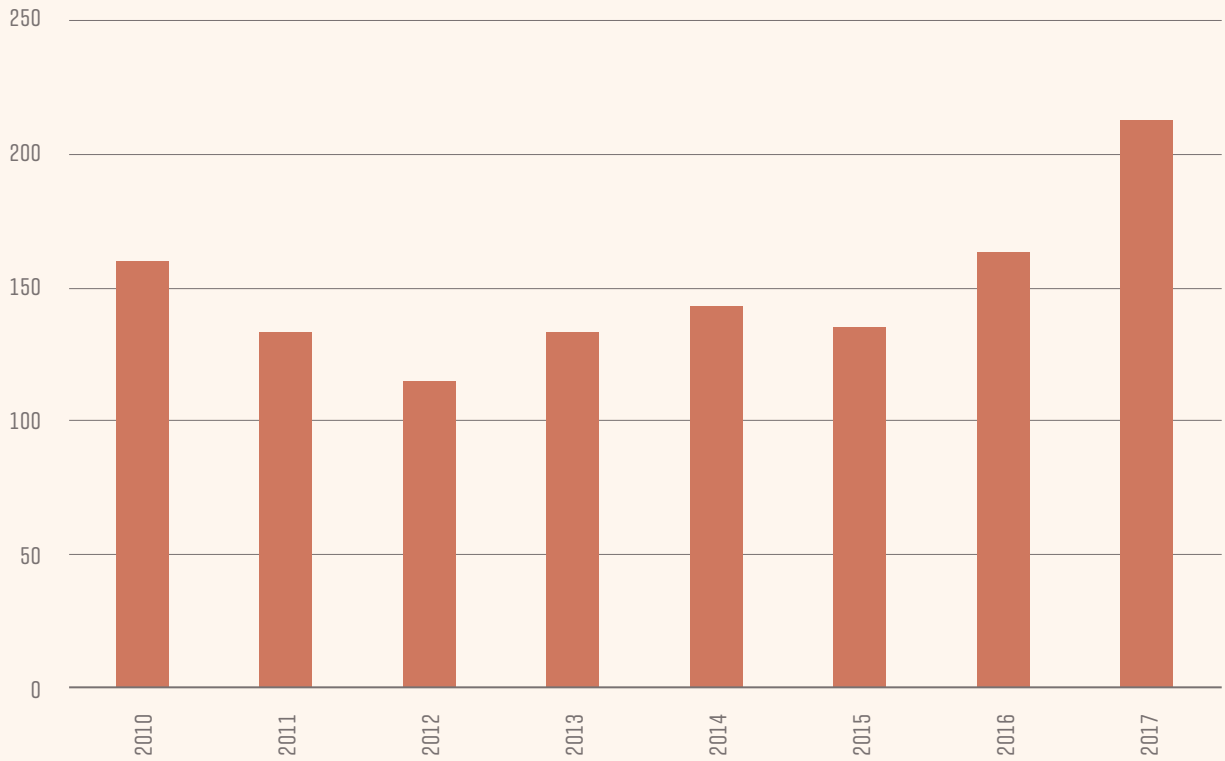
In the following years, the rising costs caused by export duties and quantitative restrictions on agricultural exports made evident the need for a change in agricultural policy. Part of this reform agenda was initiated by the new administration that began in December 2015.

SINCE 2011, THE RISING COSTS CAUSED BY EXPORT DUTIES AND QUANTITATIVE RESTRICTIONS ON AGRICULTURAL EXPORTS MADE EVIDENT THE NEED FOR A CHANGE IN AGRICULTURAL POLICY

IV. POLICY CHANGES SINCE 2016

In December 2015, the new government introduced major changes in agricultural policy by eliminating export duties for most agricultural products (except for soybean oil and soybeans). Export restrictions were also abolished and the foreign exchange market was deregulated. As a result of the change in relative prices, farm incomes improved. For example, Lema, Amaro, Benito, and Rabaglia (2017) estimate an increase of 15 percent in gross income for grain crops and 53 percent in "gross margin" (income minus variable costs) between December 2015 and February 2016, an important part of which is a result of the reduction in export taxes. Crop production is rising, in particular for corn and wheat (see Figure 1). A positive growth rate was also observed for beef production and exports in the years 2016 and 2017 (Figure 5). However, in some sub-sectors, competitiveness problems remain (farm size distribution, high input costs, logistics, market regulations).

FIGURE 5: CHILLED AND FROZEN BEEF EXPORTS (THOUSAND TONS)



Source: IPCVA.

In dairy production, for example, adjustments in farm size are taking place: dairy farms decreased from some 15,000 in 2000 to 10,000 in 2014 (Snyder, 2015), while total output remained unchanged. Increased size of the dairy herd per farm, coupled with increased productivity explains unchanging output despite falling dairy farm numbers. For example, in the 2008-2018 period output per farm increased 23 percent (OCLA, 2018). Despite these adjustments, some observers perceive considerable stress in the sector (Infortambo, 2018).

The change in policy environment resulting from the administration elected in 2015 is summarized by published documents of the SAgroind (previously Ministerio de Agroindustria MINAGRI, 2017). The policy documents include the objectives of increasing agricultural output, reducing production costs (including those arising from paperwork), and improving transparency and environmental sustainability.

Policy measures implemented since December 2015 include:

- Elimination of export taxes for all products, excluding soybeans.
- For soybean grain, reduction of taxes from 35 to 30 percent, for soybean meal and oil from 30 to 27 percent.
- Starting in January 2018, further reductions of 0.5 percent per month over the following years (until export duties for soybeans and soybean meal and oil are totally eliminated)
- Elimination of export permits for all products.

General agricultural policy objectives include:

- Investment in infrastructure.
- Simplifying regulation and paperwork for producers.
- Improving strategies for insertion into international markets.
- Establishing a new mechanism for the allocation of European Union quotas for beef.
- Modernizing the Servicio Nacional de Sanidad y Calidad Agroalimentaria (SENASA).
- Testing and developing mechanisms for agricultural insurance.
- Developing improved agricultural credit mechanisms.
- Increasing transparency in agricultural and agro-industry value chains.
- Supporting agricultural sustainability initiatives (good practices, disposal of agro-chemical containers).
- Improving food safety regulation: simplification and efficiency.
- Property rights in seeds: project proposal for new legislation.

With the exception of the elimination and reduction of export taxes and export permits, most of the items listed above are *proposals* for future action and not results of past actions. As of March 2018, it is probably too early to evaluate the overall impact of President Macri's agricultural policy; however, in the near future, attention should be focused on assessing these issues.

In relation to the above, opportunities (and significant challenges) exist in Argentina to carry out Benefit/Cost (B/C) analysis of publicly-sponsored initiatives. Indeed, rigorous B/C analysis of

agricultural policies or projects is almost absent in the country, despite the significant resources channeled from the public sector to agriculture. A notable example is the increase in the investment in general services for agriculture from US$200 million in 2007 to more than US$400 million in 2016, which was not accompanied by efforts to understand the impacts of this significant jump in resource allocation to the sector. Also, public infrastructure projects carried out by the Programa de Servicios Agrícolas Provinciales (PROSAP) currently receiving some US$40 million annually could benefit enormously from impact evaluations. The same applies (and even more so) to the agricultural extension services programs managed by INTA, whose budget increased from US$80 million in 2007 to US$211 million in 2016. In summary, modest resources allocated to developing rigorous, evidence-based B/C analysis can potentially contribute to increasing the efficiency of the US$600 million-plus allocated annually to public programs for agriculture. These efforts could also contribute to improving resource allocation in the multiple public programs not under MINAGRI's control but nonetheless aimed at the agricultural sector and rural areas. Road and communications infrastructure, education and health in rural areas, and small- and medium-sized enterprise development are examples of such programs.

Future challenges for Argentine agricultural policy include dealing with the increasing demands of environmental groups for more environmental attention, upgrading data and information systems to a level that is adequate for the importance of agriculture in the economy, deciding on issues related to renewable energy (e.g., biodiesel from soybean oil and ethanol from corn and sugarcane), and designing intellectual property rights legislation conducive to increased R&D in the seed sector.

FUTURE CHALLENGES FOR ARGENTINE AGRICULTURAL POLICY INCLUDE DEALING WITH THE INCREASING DEMANDS OF ENVIRONMENTAL GROUPS FOR MORE ENVIRONMENTAL ATTENTION, UPGRADING DATA AND INFORMATION SYSTEMS TO A LEVEL THAT IS ADEQUATE FOR THE IMPORTANCE OF AGRICULTURE IN THE ECONOMY, DECIDING ON ISSUES RELATED TO RENEWABLE ENERGY, AND DESIGNING INTELLECTUAL PROPERTY RIGHTS LEGISLATION CONDUCIVE TO INCREASED R&D IN THE SEED SECTOR

V. ESTIMATES OF POLICY TRANSFERS

A. METHODOLOGY: THE OECD PRODUCER SUPPORT ESTIMATE (PSE) INDICATORS

The Producer Support Estimate indicators were developed and have been put into use since in order to monitor and evaluate developments in agricultural policy in OECD countries. The indicators have been calculated for OECD and an increasing number of non-OECD countries and are widely used as a comparative measure of the support to agriculture in each country. The concept of "support" or "policy transfer" is understood as transfers to agriculture from consumers and taxpayers arising from government policies that support agriculture. Support can be positive or negative, depending on the direction of the transfers (e.g., a subsidy implies a positive support and an export duty a negative transfer).

The central concept in the indicators is the **Producer Support Estimate (PSE)**, defined as **"the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm-gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income"** (OECD, 2016).

The key theoretical assumption underlying the estimation of the indicators is that agricultural markets are competitive and that a persistent price differential between the domestic and external markets is the result of government interventions. As such, this price differential (the Market Price Differential, or MPD) becomes a key parameter for estimating transfers arising from government price policies. Policies that increase domestic market prices (a positive MPD) create transfers to producers from consumers and vice versa; policies that decrease domestic market prices (a negative MPD) create transfers from producers to consumers.

Tariff and non-tariff measures affecting trade result in price differentials between international and domestic prices. Differentials between the prices farmers receive and the international prices the country faces capture not only these tariff and non-tariff aspects but also transport costs, processing costs, and quality differentials. In order to gauge transfers between farmers, consumers, and the government, it is necessary to "net out" the multiple aspects determining price differentials. Transport costs, for example, do not constitute a policy transfer, and should therefore not be included in the calculations. A tax on exports, in contrast, lowers farm-gate prices and results in government tax revenue: a transfer from farmers to the government. At the same time, a tax on commodity exports, by reducing domestic prices, also results in a transfer from farmers to consumers. Both effects should therefore be included in the calculations.

The approach adopted to calculate the MPD for the relevant commodities is the price gap method. The underlying principle is to measure the difference between two prices, i.e., a domestic market price in the presence of policies and a border price representing the theoretical opportunity price for domestic producers. We therefore need to compare the price producers receive at the farm gate with a border price that has been adjusted to make it comparable with the farm-gate producer price. To do so, adjustments are needed for both marketing margins (representing the costs of processing, transportation, and handling) and weight conversion (e.g., grain processing into oil or pellets as in the case of sunflowers). As a result of these adjustments, a border price measured at the farm-gate level is obtained: this is the Reference Price (RP).

The MPD [4] for a commodity estimated through this method is:

$$MPD_i = PP_i - RP_i$$

and

$$RP_i = (BP_i \times QA_i - MM_i) \times WA_i$$

Where:

PP_i producer price for commodity ***i***

RP_i reference price for commodity ***i*** (border price at farm gate)

BP_i border price for commodity ***i***
or products derived from commodity ***i***

QA_i quality adjustment coefficient for commodity ***i***

MM_i marketing margin for commodity ***i***

WA_i weight adjustment for commodity ***i***

This report analyzes two sets of crops. The first corresponds to **cereals and oilseeds**. These crops are mostly produced in the main agricultural region of the country (the provinces of Buenos Aires, Córdoba, Santa Fe, and Entre Ríos). **Cotton and vine** comprise the second group and are grown outside the *humid pampa*: cotton mostly in the northeast (the province of Chaco) and vine in the western limits of the country, adjacent to the Andes cordillera and the border with Chile (the province of Mendoza).

4. According to the PSE Manual, "An MPD with the sign opposite to what would be expected based on the policies in place may be calculated. This is the case, for example, when for an exported commodity the domestic price is below the border price but no policies —export duties, export restrictions, or administrative barriers to inter-regional movement of goods— are applied that would explain the negative price gap. Similarly, when for an imported commodity it may be found that the domestic price is less than the border price, but policies which should increase the domestic price are in place, such as a tariff. In such cases, the MPD is set to zero, i.e. PP = RP, on the assumption that the observed price gap is due to factors not related to agricultural policies. While setting the negative MPDs to zero may improve the accuracy of the estimation, it may also reduce consistency over time and between countries, since positive MPDs may also capture the impact of non-policy factors, while negative MPDs, when set to zero, do not." In our calculations, some MPD result with the opposite expected sign and were set to zero. See the Appendix for details.

Cereals and oilseeds are the most important agricultural export products in Argentina. The four major crops selected (wheat, corn, soybeans, and sunflowers) are products for which agricultural policy induces a lower domestic market price. This occurs through export taxes and market interventions (quantitative restrictions and export licensing). Taxes on agricultural exports are a source of budgetary revenue and also contribute to the government objective of lowering food prices for domestic consumption. Consequently, domestic prices decrease relative to border prices, creating a negative market price differential (MPD) for these products. For the crops analyzed, Argentina is an exporter. Thus, policies that reduce the domestic market price of a commodity create transfers to consumers from producers (TPC), who also finance transfers to the public budget (TPT).

The Appendix details data sources and procedures used to estimate the Market Price Differential (MPD), Market Price Support (MPS), Transfers from Producers to Consumers (TPC), and Transfers from Producers to Taxes (TPT). For grains, calculations are relatively straightforward, as border prices exist for basic commodities produced at the farm level. In these cases, differences between border and farm prices only result from: (i) export taxes and (ii) transport and handling costs. Given that (ii) may be readily estimated, the price impact of (i) can be obtained by directly comparing border (net of item (ii)) and producer prices.

In the case of livestock commodities, calculations are more complicated: for meat, the producer prices refer to live weight, while export prices refer to processed meat products. Corrections thus have to be made to take into account: (i) the transformation ratio from live weight to carcass weight (the exported product), (ii) processing costs, and (iii) handling and transport costs. Thus, for example, for beef it is assumed that 100 kg of live weight results in a 55 kg carcass weight. Processing costs per ton of carcass weight are estimated on the basis of published sources.

In the case of milk, additional calculations are needed, as the price producers receive is expressed per liter of milk, while dairy exports occur not as fluid milk but as powdered milk and different kinds of cheese. Again, the transformation ratio of milk into these outputs needs to be taken into account.

The processing costs necessary to transform fluid milk into the different dairy products that are exported must also be taken into account. For example, for the year 2013, border prices for the (tradable) butter and skim milk powder (SMP) of, respectively, US$3,462 and $3,529 per ton resulted in an implicit price for

(non-tradable) raw milk (at the border) of US$472/ton.[5] This "implicit" price of milk at the border, minus marketing and transport costs from the farm to the border, minus processing costs for the transformation of milk into butter and SMP, yields the "Reference Price" (RP), which is the price that the producer would receive if no export taxes were present. The difference between prices effectively received (PP) and this reference price (RP) can therefore be considered a direct effect of export taxes.[6]

B. PRODUCER SUPPORT ESTIMATES: PRICE TRANSFERS

In this section, we present estimates of transfers resulting from economic policy in Argentina in the 2007–2016 period. General aspects related to the estimation of transfers are detailed in the OECD Producer Support Estimate and Related Indicators of Agricultural Support manual (OECD, 2016). We closely follow the calculation procedures presented in the manual, and the tables presented in the Appendix are designed to correspond to the tables presented in Chapters 6–8 of the OECD manual. [7] We thus present here a summary of these procedures as they relate to policy transfers in the Argentine agricultural sector.

Most of the agricultural commodities produced in Argentina are internationally traded, and the country is a net exporter in major crop, beef, and milk markets. The set of commodities for analysis was selected following the criteria that more than 70 percent of the total value of agricultural production should be covered. The following commodities are included in the report: wheat, corn, soybeans, sunflowers, beef, pork, poultry, milk, cotton, and vine (grapes for wine and must). These products are the Market Price Support Commodities (MPSi) and the period considered is 2007–2016 (Table 2).

5. We follow the OECD methodology that considers butter and SMP as the reference tradable commodities to estimate the implicit border price of raw milk. However, in the case of Argentina, butter and SMP account for less than 10 percent of dairy exports because most of the exports of Argentina are whole milk powder and cheese. This is important to bear in mind because changes in the relative prices of those products can imply over- or underestimation of the real implicit milk prices.

6. Export quotas may in some cases also be relevant.

7. The lower left corner of each of our tables contains a reference to the corresponding table in the OECD manual. For example, our Table 4 corresponds to Table 6.2 of the manual.

TABLE 2: SELECTION OF COMMODITIES FOR MPS CALCULATION

COMMODITY	% OF THE TOTAL VALUE OF PRODUCTION:	AVERAGE 2007-2016	CUMULATIVE %
SOYBEANS		26,65%	26,65%
CORN		6,00%	32,65%
WHEAT		4,45%	37,10%
SUNFLOWERS		1,80%	38,90%
COTTON		0,59%	39,49%
VINE		2,32%	41,81%
DAIRY		7,37%	49,18%
BEEF		18,19%	67,37%
POULTRY		5,19%	72,56%
PIGMEAT		1,44%	74,00%
VALUE OF PRODUCTION MPS COMMODITIES - VP (I)		**74,00%**	**74,00%**
TOTAL VALUE OF PRODUCTION AGRICULTURE - VP (C)		**100,00%**	**100,00%**

Source: Own elaboration from INDEC data.

As shown, approximately 40 percent of the total value of production corresponds to cereal and oilseed crops and 35 percent to animal production, with beef production being the most important (18 percent of the total).[8]

Export taxes have been an important source of fiscal revenue. The analysis of "policy transfers" for Argentina is thus different than that conducted for most other countries: in Argentina, transfers have taken place from producers to consumers, whereas in most other countries, transfers have followed the opposite direction. In addition, in Argentina, the analysis of transfers is relatively "simple" when compared either to OECD countries or several developing economies, since economic policy in Argentina has resulted in relatively few programs transferring financial or other resources to individual agricultural producers. Moreover —and in contrast to the situation in several OECD countries— most of these programs presented relatively straightforward eligibility requirements.

The magnitude of export taxes has varied over time. Following the 1990s, when export taxes were absent, taxes were re-imposed after 2001 and reached 23 percent for wheat, 20 percent for corn, 32 percent for sunflowers, 35 percent for soybeans, and

8. The values of production for MPS commodities in Table 4 were calculated at farm gate using the PSE methodology by commodity. The share of MPS commodities in the total agricultural value of production (74 percent) was estimated using data from the National Accounts System from 2007 to 2016.

15 percent for livestock products in 2015. In December 2015, export taxes were reduced to 30 percent for soybeans, 27 percent for soy meal and oil, and zero for all other products.

Export taxes result in income transferred from producers to consumers and from producers to taxpayers (tax revenue). Lower domestic prices lead to increases in the level of domestic consumption and a reduction in production. The magnitudes of these changes depend of course on the elasticity of the demand and supply of the relevant commodity. For exported commodities, the difference between the Reference Price (RP) and the Producer Price (PP), multiplied by the total amount produced, represents the total transfer from producers to consumers and as tax revenue. This is called the "Market Price Support" (MPS) for the commodities. In some cases, adjustments have to be made because part of the exported commodity might be used as animal feed and not consumed directly by consumers. Table 3 shows MPS levels for the decade analyzed in this report and for the ten commodities selected.[9]

TABLE 3: CALCULATION OF NATIONAL (AGREGATE) MPS. US$ MILLION

SYMBOL	DESCRIPTION	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	AVERAGE
VP (C)	TOTAL VALUE OF PRODUCTION	31.809,4	37.778,7	26.660,4	41.923,1	50.271,1	50.293,2	49.994,8	48.670,5	43.049,9	45.167,5	42.561,9
VP (AMC)	TOTAL VALUE OF PRODUCTION (MPS COMMODITIES)	23.539,0	27.956,2	19.728,7	31.023,1	37.200,6	37.217,0	36.996,2	36.016,2	31.856,9	33.424,0	31.495,8
MPS (SOY)	SOYBEANS	-3.063,4	-4.564,0	-3.998,8	-4.942,2	-7.318,2	-3.017,2	-8.080,0	-8.820,9	-6.765,6	-4.903,5	-5.547,4
MPS (CORN)	CORN	-579,5	-1.861,6	-1.057,6	-770,8	-2.511,0	-1.367,0	-2.940,9	-1.748,6	-1.898,9	0,0	-1.473,6
MPS (WHEAT)	WHEAT	-889,0	-2.001,6	-779,0	-241,4	-1.959,9	-972,6	-291,9	-1.230,0	-1.366,0	0,0	-973,1
MPS (SUNF)	SUNFLOWERS	-456,7	-480,3	-372,6	-498,0	-789,9	-623,3	-423,3	-161,4	-224,1	0,0	-403,0
MPS (COT)	COTTON	-8,2	-12,1	-23,3	-126,0	-264,7	-91,4	-38,2	-15,3	82,9	0,0	-49,6
MPS (VINE)	VINE	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
MPS (DAIRY)	DAIRY	-474,1	-1.060,2	-66,9	-490,2	-219,1	-234,6	-572,2	-556,7	429,4	83,4	-316,1
MPS (BEEF)	BEEF	-945,8	-3.329,1	-1.598,0	-707,2	-1.844,4	-66,4	-494,5	-8,0	402,5	13,2	-857,8
MPS (POULTRY)	POULTRY	99,2	63,5	191,9	-165,5	236,9	557,7	714,3	566,0	925,8	890,2	408,0
MPS (PIG)	PIGMEAT	35,6	87,2	85,3	50,7	149,4	283,2	199,3	196,3	212,9	49,5	134,9
MPS (AMC)	ALL MPS COMMODITIES	-6.282,0	-13.158,1	-7.618,9	-7.890,7	-14.521,0	-5.531,6	-11.927,4	-11.778,5	-8.201,2	-3.867,1	-9.077,7
MPS (C)	MARKET PRICE SUPPORT	-8.489,2	-17.781,3	-10.295,8	-10.663,1	-19.622,9	-7.475,1	-16.118,1	-15.916,9	-11.082,7	-5.225,8	-12.267,1

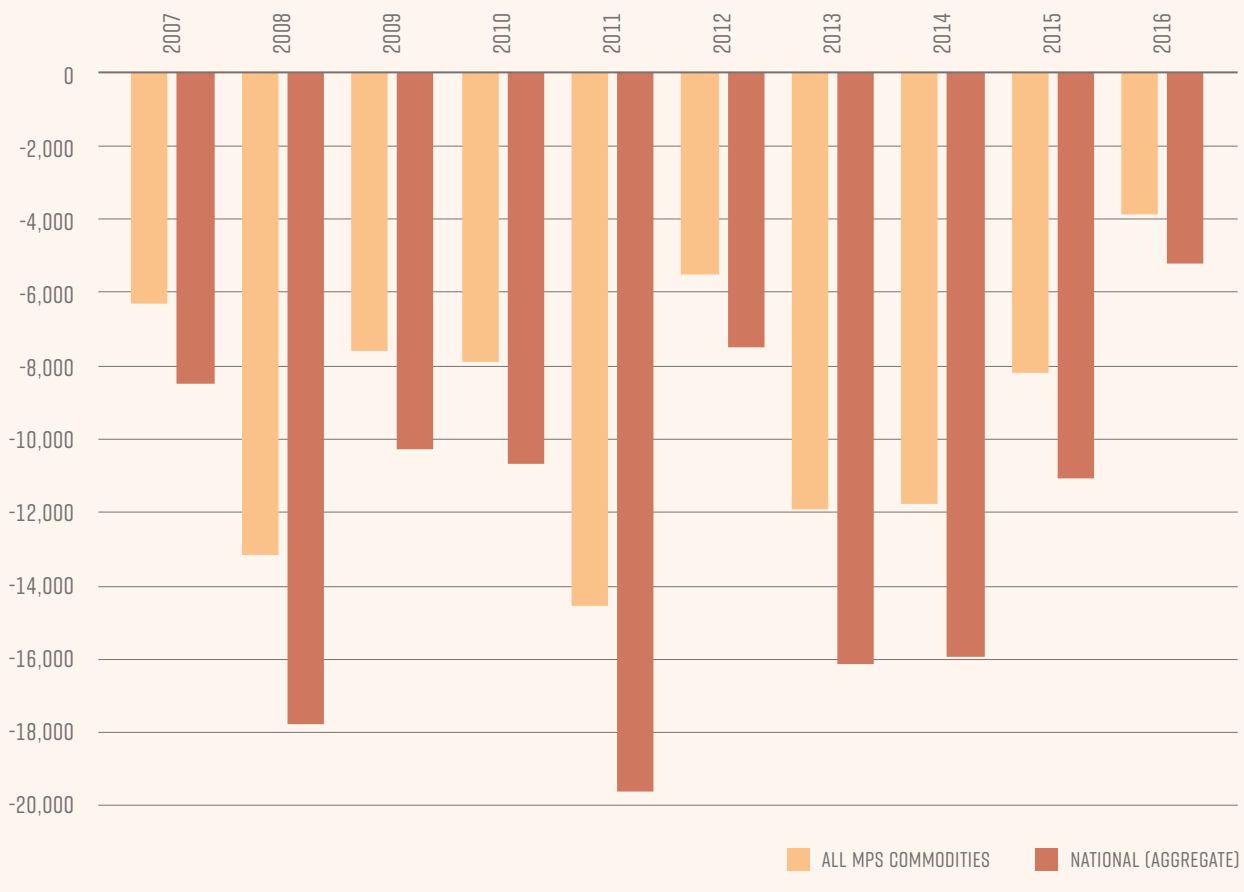
Source: SAGPyA.

9. Tables A.1-A.10 (Appendix) present detailed calculations following the OECD PSE Manual methodology. They are the basis for all subsequent support estimates that were calculated.

Simple extrapolation (see Table 6.6 in the OECD Manual) allows estimation of the MPS of other commodities and the total country-wide MPS. For the 2007–2016 period, the total MPS was always negative, indicating that revenues were transferred from producers to others (consumers and taxpayers). Total MPS for the 2007–2016 period averaged some US$12 billion annually, 40 percent of which corresponds to transfers from soybean production. Beef and corn production account for 17 and 10 percent of total MPS respectively.

Note the important inter-year variation in total MPS: its value in 2008 is more than double that of 2007. A reduction of 30 percent in soybean and corn output in 2008 compared to 2007, coupled with a fall of 10–12 percent in prices explains a significant part of the variation in MPS values between these two periods. Important changes also occur in 2011 and 2013 compared to 2010. International prices and export quantities are the major

FIGURE 6: MARKET PRICE SUPPORT (THOUSAND US$)



Source: Agrimonitor.

drivers of these variations, because ad valorem export taxes (the most important policy instrument used in Argentina) remained relatively fixed after 2008 until 2015. Note also the sharp reduction in (negative) MPS occurring in 2016, resulting from the elimination of export taxes and other barriers to trade (in the case of soybeans, a reduction from a 35 to a 30 percent export tax).

Transfers from producers to consumers and to tax revenue are thus a function not only of events occurring domestically (output quantities, export tax levels) but also of trends in international markets (export prices). Thus, in the case of soybeans for the crop years 2011, 2013, and 2014, relatively high international prices (US$480–500/ton) coupled with production quantities of 49–53 million tons resulted in an annual transfer from only this crop (to consumers and tax revenue) of US$6.7–7.5 billion.

The PSE methodology allows for a decomposition analysis of changes resulting from (i) changes in the quantities produced and (ii) changes in the differential between reference (border) and producer prices adjusted for processing, handling, and transport costs. As a synthesis of the **MPS evolution and the decomposition analysis**, the following points can be highlighted:[10]

- **Large inter-year variation in MPS is observed:** for soybeans, percentage variations (in absolute terms) range from 20 to nearly 60 percent; for corn, from 15 to nearly 230 percent.
- **In the case of soybeans, maximum percentage increase and decrease is similar for quantity and price-related sources of variation**. In the case of corn, however (and contrary to a priori expectations), maximum percentage increases and decreases appear to be greater for price rather than for quantity-related variation.
- **The trend for wheat is similar to that for corn: wide variations in MPS are observed**; however, variations resulting from changes in prices appear to be greater than those resulting from changes in quantities.
- **For the livestock sub-sector presented here (beef production), MPS shifts resulting from quantity variations are limited** (in absolute terms, they range between 6 and 20 percent). However, variations due to prices are much higher, and range from 50 to 410 percent.

10. The equation 11.6 (page 149 contribution analysis) of the OECD "PSE Manual" was followed to obtain the results. Detailed calculations are not presented here but are available upon request from the authors.

In the period analyzed here (2007–2016), commodity prices varied substantially: from US$290 to $480 per ton for soybeans, US$150 to $230 per ton for corn, US$200 to $290 per ton for wheat and US$4,000 to $8,200 per ton (carcass weight) for beef. Under these conditions, the same export tax rate on commodities obviously results in widely varying transfers from producers to consumers and government revenues High commodity prices prevailing since 2007 (with corresponing high farm incomes made these transfers "easier to digest" for producers; however, in absolute magnitudes, these high commodity prices resulted in massive transfers from farmers to government revenueas well as consumers.

In Argentina, the ten commodities included in the MPS calculations represent approximately 75 percent of the total value of agricultural output; thus, the extrapolation of transfers from included commodities to the total (included and excluded commodities) should involve a relatively a small margin of error.[11] The fact that (in general) a smaller portion of the excluded (as compared to the included commodity output) is exported, and also that export taxes are smaller or non-existent for the non-included commodities, suggests that the MPS for these commodities may be biased upward. For example, prior to 2016, export taxes for fruits and vegetables were 5 percent, as compared to 20–35 percent for the major grain outputs that comprise our "included commodity" set. In 2016, taxes were eliminated for all agricultural products except for soybeans, so the bias of extrapolating transfers for excluded commodities on the basis of included commodity values can be expected to be smaller than that of previous periods.

11. MPS(c) is the estimate of country-wide MPS, obtained by multiplying the total MPS of standard commodities (MPSsmc) by the ratio of the total value of production to the value of production of the MPS commodities.

C. PRODUCER SUPPORT ESTIMATES: OTHER TRANSFERS

Transfers may occur not only as a result of export taxes and other border measures, but also through budgetary allocations. For instance, producers may be eligible for different kinds of payments and/or subsidies based on inputs used. Adding non-budgetary price-based transfers (MPS) to these other budgetary transfers, we can obtain a total measure of transfers to or from individual agricultural producers: the Producer Support Estimate (PSE). The Market Price Support estimates are combined with the value of other transfers arising from policies that support individual producers[12] to derive a value for the PSE at the national level. Table 4 presents the calculation of the national PSE indicator in Argentina, showing that the support is always negative in the period 2007–2016, averaging some US$12 billion per year.

TABLE 4: CALCULATION OF PSE. US$ MILLION

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	AVERAGE
PRODUCER SUPPORT ESTIMATE (PSE)	-8.358,3	-17.162,9	-9.841,4	-10.219,3	-19.580,3	-7.423,7	-16.077,5	-15.864,8	-11.051,9	-5.205,4	-12.078,5
A. SUPPORT BASED ON COMMODITY OUTPUTS											
A.1 MARKET PRICE SUPPORT (MPS)	-8.489,2	-17.781,3	-10.295,8	-10.663,1	-19.622,9	-7.475,1	-16.118,1	-15.916,9	-11.082,7	-5.225,8	-12.267,1
A.2 PAYMENTS BASED ON OUTPUT (ONCCA SUBSIDIES):	108,6	595,0	431,1	415,0	0,0	0,0	0,0	0,0	0,0	0,0	221,4
SOYBEANS / SUNFLOWER PRODUCERS	0,0	0,2	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
WHEAT / CORN PRODUCERS	19,1	52,5	30,5	3,5	0,0	0,0	0,0	0,0	0,0	0,0	15,1
DAIRY PRODUCERS	25,0	104,8	104,5	79,0	0,0	0,0	0,0	0,0	0,0	0,0	44,8
PORK PRODUCERS	7,2	20,8	0,3	0,0	0,0	0,0	0,0	0,0	0,0	0,0	4,0
POULTRY PRODUCERS	49,6	220,2	113,6	160,0	0,0	0,0	0,0	0,0	0,0	0,0	77,6
BEEF FEEDLOT PRODUCERS	7,7	196,6	182,1	172,5	0,0	0,0	0,0	0,0	0,0	0,0	79,8
B. PAYMENTS BASED ON INPUT USE	22,3	23,4	23,4	28,8	42,6	51,5	40,7	52,1	30,7	20,4	33,2
COTTON PRODUCERS	16	16	13	13	12	11	9	20	17	11	12,9
INTEREST RATE SUBSIDIES & CREDIT RESTRUCTURING	6,3	7,6	9,9	15,9	30,5	40,5	31,5	32,4	13,5	9,6	20,3

Source: Agrimonitor.

12. The other transfers include payments based on output, input use, current area or animal number, receipts or income, and miscellaneous payments.

Table 4 shows total MPS transfers for the 2007–2016 period in addition to different categories of budgetary transfers. The following results are highlighted:

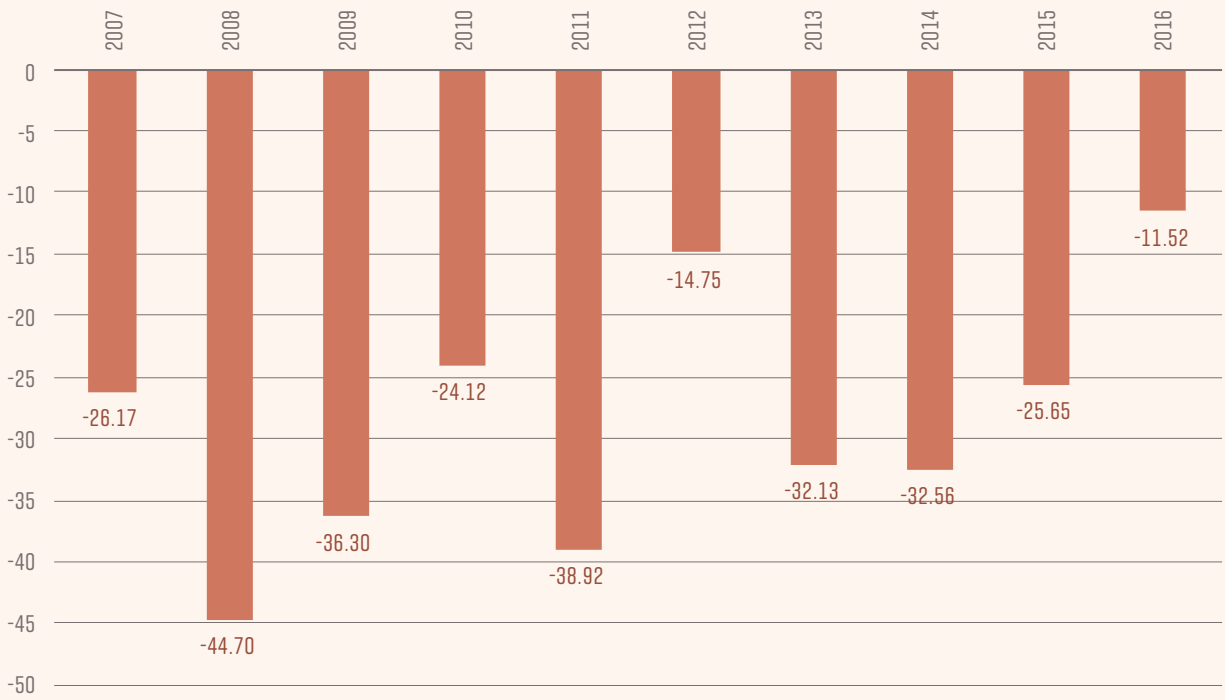
- **In absolute numbers, MPS annual transfers from producers amount to US$12 billion.** Producers received "back" as budgetary transfers some US$200 million on average, representing less than 2 percent of the total MPS figure.
- **It is important to note that, in the 2008–2010 period, significant (US$415–595 million) transfers corresponded to direct payments based on output.** Interestingly, most (70 percent) of these subsidies went to relatively large-scale "industrial" agricultural producers (feedlots and poultry operations, and to a lesser extent to dairy farms).
- **Credit subsidies, provided either as interest-rate reductions or as refinancing subsidies, represent on average a small proportion (<10 percent) of total payments** (payments based on output + payments based on input).

Market Price Support transfers from producers to consumers and tax revenue are significantly (approximately 30 times) higher than transfers to producers. This means the inter-year variation in PSE levels is basically a result of variations in MPS levels and not of variations in budget allocations from the government to producers. As mentioned in the previous section, these inter-year variations of MPS are a result both of variations in output as well as in international prices. The relative importance of both sources of variation differs across sub-sectors: in general, inter-year output variations are greater for crops than for livestock sub-sectors, thus for crop production, output variability (mostly associated with climatic variability) should be a more significant component of MPS variation than is the case for livestock.

From the PSE estimates, the relative indicator %PSE is derived. The %PSE is an indicator of support provided to individual agricultural producers at the national level relative to the value of production at farm level. This indicator shows the importance of agricultural support relative to producer receipts. Figure 7 shows that the negative value of PSE% reached an (absolute) minimum of 12 percent in 2016 and a maximum of 45 percent in 2008,[13] averaging 29 percent in the 2007–2016 period.

13. The absolute increase in the negative PSE in 2008 was basically a result of the negative market price support and was caused by rising international prices (used as a reference source), an increase in export duties, and the implementation of export quotas for beef, milk, corn, and wheat.

FIGURE 7: PSE AS % OF GROSS FARM RECEIPTS (%PSE)



Source: Agrimonitor.

Export taxes of 35 percent for soybeans, 20–25 percent for other grain products, and 15 percent for beef added to the quantitative restrictions on agricultural exports explain these figures. An average %PSE of nearly -29 percent means that the estimated total value of policy transfers from individual producers to consumers and tax revenue represents 29 percent of total gross farm receipts.[14]

The negative support, while high, shows unequal distribution between the sub-sectors. For example, Table 3 shows that soybean grain production and beef production are very highly taxed, but dairy, poultry, and pork production have in fact had positive support in some years. For these livestock activities, the positive support is in great part explained by the implicit subsidy for animal feed generated by the export duties and quantitative export restrictions applied to grains. In the case of pork production, import tariffs and quantitative restrictions on imported meat were also applied during the 2007–2015 period.

14. Gross farm receipts is the value of production plus Budgetary and Other Transfers provided to producers (i.e., VP+BOT).

D. GENERAL SERVICE SUPPORT ESTIMATES (GSSE)

Agricultural producers may receive support not only individually (support based on output, input, or other variables) but also collectively. In general, this support is represented by state investment in the provision of public goods, whose main benefits accrue to the agricultural production sector. The General Services Support Estimate (GSSE) captures investment in public goods focused on the agricultural sector. Investment in R&D, rural roads, or animal health surveillance and early warning systems belongs in this category. Accounting for these investments is of particular importance given the linkages between agricultural public goods (in particular, scientific and technical research) and output growth. Indeed, in a recent research paper, Anriquez et al. (2016) present evidence showing that shifting the composition of public expenditures toward public goods is far more beneficial to per-capita sectoral income than increasing total government spending on the sector proportionally across the board.

Table 5 shows measures of support belonging to this category. **For the period under study, GSSE averaged some US$550 million annually, increasing from $280 million annual dollars in 2007 to $640 million in 2016**. Approximately 80 percent of this total is allocated to two organizations: INTA (Instituto Nacional de Tecnología Agropecuaria) and SENASA (Servicio Nacional de Sanidad y Calidad Agroalimentaria). INTA is the principal government R&D organization. In turn, SENASA has authority over animal and plant health, food safety, and agricultural input quality monitoring.[15] Table 5 also shows that the total budget allocations to INTA (R&D) plus SENASA increased from US$134 million in 2007 to US$336 million in 2016, which represents a more than doubling of their budget allocation. In the 2007–2016 period, R&D (basically INTA) averaged some 40 percent of total GSSE expenditure. Out of total GSSE resources, these expenditures can be most closely related to the productivity increases observed in the agricultural sector. Indeed, cross-country empirical evidence suggests that technological change resulting from public and private investments in agricultural R&D has enabled a substantial amount of productivity growth (Alston, 2010).

15. INTA's budget was partitioned into extension (54 percent of total) and R&D (46 percent). Extension is imputed to PSE (a "free" input to individual producers), while R&D is imputed to "public goods" (GSSE).

In the case of SENASA, approximately 36 percent of the organizational budget is allocated to animal health activities, 40 percent to food safety, and the remaining 24 percent to various activities related to plant protection and laboratory services (Gallacher, 2008 and 2014). SENASA obtains an important portion of its revenues through levies on agricultural exports as well as from compulsory inspection services on commodity and food transport, storage, and processing.

TABLE 5: CALCULATION OF GSSE. US$ MILLION

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	AVERAGE
EXCHANGE RATE	3,12	3,16	3,73	3,89	4,13	4,55	5,48	5,48	9,30	14,80	–
GENERAL SERVICES SUPPORT ESTIMATES (GSSE)	280,8	358,3	380,8	426,2	526,7	830,0	705,0	705,0	712,1	640,4	548,9
H. AGRICULTURAL KNOWLEDGE AND INNOVATION SYSTEMS											
AGRICULTURAL KNOWLEDGE GENERATION											
INTA	68,8	95,5	93,0	113,7	136,0	226,7	185,3	185,3	181,4	180,1	144,7
INASE	2,7	3,3	3,6	5,2	6,3	11,5	10,8	10,8	12,2	9,8	7,6
INV	10,5	12,2	14,5	18,5	25,2	30,3	29,4	29,4	28,6	21,8	21,9
AGRICULTURAL KNOWLEDGE TRANSFER											
EXTENSION AND ADVISORY SERVICES	81	112	109	134	160	266	218	218	213	211	169,8
J. INSPECTION AND CONTROL SERVICES											
SENASA	65,2	92,2	116,4	109,6	137,7	190,5	169,7	169,7	191,9	155,9	138,9
PROSAP (ANIMAL & PLANT HEALTH, FOOD QUALITY)	12,5	0,0	0,3	0,0	0,0	0,0	0,0	0,0	0,0	0,0	1,3
K. DEVELOPMENT AND MAINTAINANCE OF INFRASTRUCTURE											
INFRASTRUCTURE											
PROSAP (INFRASTR, INST STRENGTHENING)	23,8	26,8	17,5	26,1	39,0	36,9	32,7	32,7	59,9	46,0	34,4
FARM RESTRUCTURING											
SOCIAL PROGRAMS	8,9	11,1	21,4	17,6	20,8	14,6	8,9	8,9	0,0	0,0	11,6
PRODUCTIVE RECONVERSION	3,5	3,4	4,3	1,9	2,1	53,3	50,7	50,7	25,1	15,3	18,1
L. MARKETING AND PROMOTION											
PROSAP (TECHNOLOGY & MKT DEVELOPMENT)	4,0	1,8	0,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,6
M. PUBLIC STOCKHOLDING	–	–	–	–	–	–	–	–	–	–	–

Source: Agrimonitor.

E. TOTAL SUPPORT ESTIMATE (TSE), PERCENTAGE GSSE, AND PERCENTAGE TSE

The Total Support Estimate (TSE) is the annual monetary value of all gross transfers from taxpayers and consumers arising from policies that support agriculture, net of the associated budgetary receipts. In order to ensure consistency in the calculations, the TSE was calculated using two methods. The first sums up the transfers distinguished by recipient, i.e., transfers to producers (PSE), transfers to general services (GSSE), and transfers to consumers from taxpayers (TCT). The second totals the transfers from different sources: transfers from consumers (TPC+OTC) and transfers from taxpayers ((PSE – TPC) + GSSE + TCT – OTC).[16] Table 6 presents the calculation results in US$ million. **The average TSE for the period is negative and amounts, on average, to US$12.1 billion annually. This result confirms the above-mentioned small effect of GSSE on offsetting the large and negative MPS.**

TABLE 6: CALCULATION OF %GSSE AND %TSE

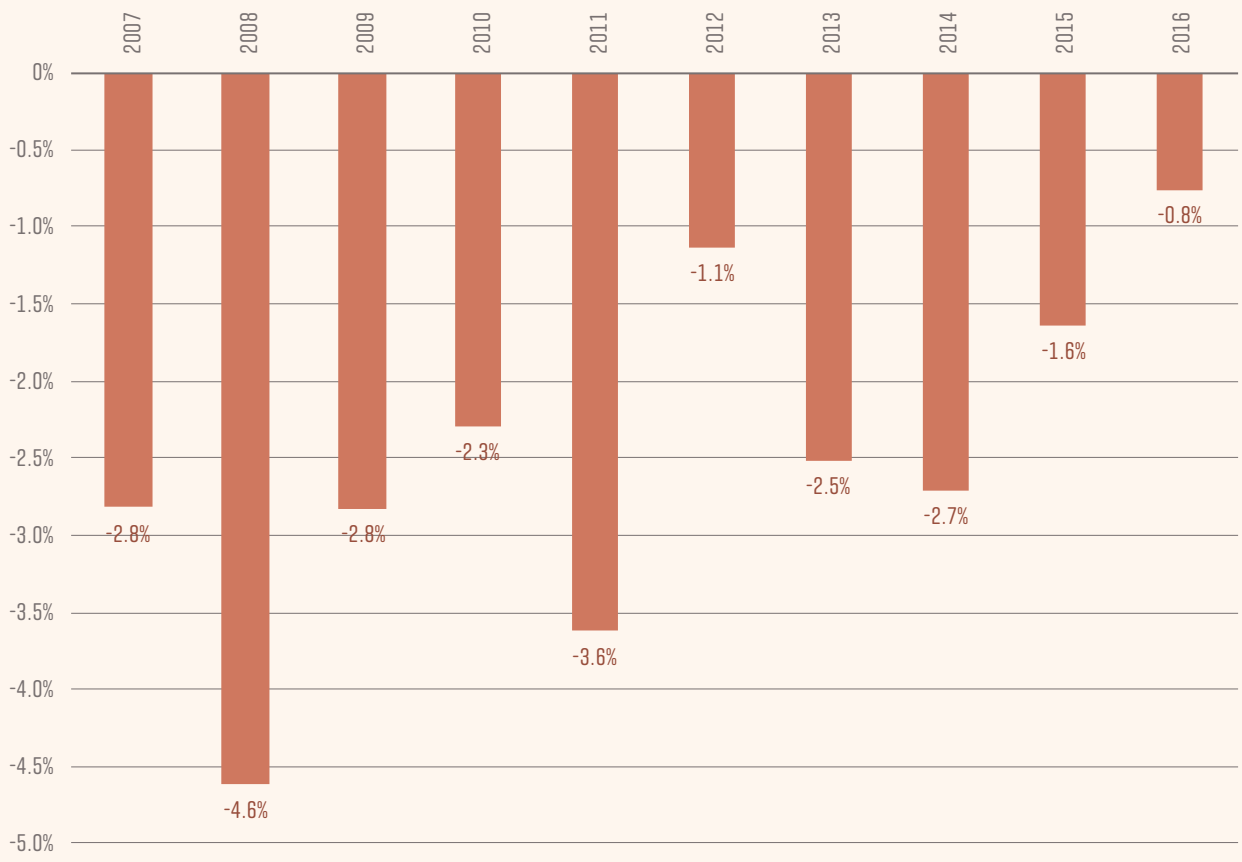
	UNITS	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	AVERAGE
GSSE GENERAL SERVICES SUPPORT ESTIMATE	US$ MILL	281	358	381	426	527	830	705	628	712	640	501
TSE TOTAL SUPPORT ESTIMATE	US$ MILL	-8.078	-16.805	-9.461	-9.793	-19.054	-6.594	-15.372	-15.236	-10.339	-4.563	-12.165
%GSSE PERCENTAGE GENERAL SERVICES/SUPPORT ESTIMATE	%	-3,5	-2,1	-4,0	-4,4	-2,8	-12,6	-4,6	-4,1	-6,9	-14,0	-4,8
GDP GROSS DOMESTIC PRODUCT	US$ MILL	287.494	363.650	334.553	426.632	527.609	579.761	611.470	563.615	629.464	595.066	447.310
GDP GROSS DOMESTIC PRODUCT	AR$ MILL	896.980	1.149.646	1.247.929	1.661.721	2.179.024	2.637.914	3.348.308	4.579.086	5.854.014	8.806.974	–
%TSE PERCENTAGE TOTAL SUPPORT ESTIMATE	%	-2,81	-4,62	-2,83	-2,30	-3,61	-1,14	-2,51	-2,70	-1,64	-0,77	-2,83
EXCHANGE RATE	(AR$/US$)	3,12	3,16	3,73	3,89	4,13	4,55	5,48	8,12	9,30	14,80	–

Source: INDEC - National Accounts.

16. See Section 8.2 of the OECD Manual, 2016.

The Percentage GSSE (%GSSE) and Percentage TSE (%TSE) are two relative indicators of support derived from the absolute values of GSSE and TSE. The %GSSE indicates the importance of support to general services within total support. It is calculated as the percentage share of the TSE (GSSE/TSE). The %TSE indicates the level of total support to agriculture relative to the country's gross domestic product (GDP). Table 6 presents the results of these calculations: the average %GSSE is estimated at -5 percent and the average %TSE is estimated at -3 percent. The value of %GSSE indicates that agricultural producers in the 2007–2016 period received "back" 5 percent of the negative TSE. At the same time, the %TSE suggests that agricultural producers transferred to consumers and in the form of tax revenue, on average and per year, 3 percent of the GDP. Figure 8 presents the evolution of %TSE from 2007 to 2016, showing the important reduction in absolute negative total support after the elimination of export restrictions and export duties in 2016.

FIGURE 8: TSE AS A % OF GDP



Source: Agrimonitor.

F. CONSUMER SUPPORT ESTIMATE (CSE)

Table 7 shows the Consumer Support Estimate (CSE)[17] for the Argentine economy. CSEs are an estimate of resource transfers from the agricultural sector to consumers: for a given commodity, the difference between the reference price (FOB price minus transport and handling costs) and the price the farmer receives is a function of taxes on the export of the commodity. The lower price the farmer receives due to taxes is a subsidy to consumers. In turn, the difference between total production and domestic consumption (equal to exports) is revenue from taxes on exports. For the 2007-2016 period, total CSE averaged almost US$4.2 billion annually. Given the country's population of 41 million, this transfer averages US$100 per person per year, or US$400 for a four-person household.

TABLE 7: CALCULATION OF CSE. US$ MILLION

SYMBOL	DESCRIPTION	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	AVERAGE
VP (C)	VALUE OF PRODUCTION	31.809,4	37.778,7	26.660,4	41.923,1	50.271,1	50.293,2	49.994,8	48.670,5	43.049,9	45.167,5	42.561,9
VP (AMC)	VALUE OF PRODUCTION MPS COMMODITIES	23.539,0	27.956,2	19.728,7	31.023,1	37.200,6	37.217,0	36.996,2	36.016,2	31.856,9	33.424,0	31.495,8
TCT(C)	TRANSFER TO CONSUMERS FROM TAXPAYERS	0	0	0	0	0	0	0	0	1	2	0
TCT(AMC)	TRANSFER TO CONSUMERS FROM TAXPAYERS FOR MPS COMMODITIES	0	0	0	0	0	0	0	0	0	0	0
TCT(XE)	TRANSFER TO CONSUMERS FROM TAXPAYERS FOR NON-MPS COMMODITIES	0	0	0	0	0	0	0	0	1	2	0
TPC(C)	TRANSFERS TO PRODUCERS FROM CONSUMERS	2.918	9.240	4.336	3.218	8.205	2.729	5.168	5.393	2.579	184	5.151
TPC(AMC)	TRANSFERS TO CONSUMERS FROM PRODUCERS ALL MPS COMMODITIES	2.159	6.837	3.209	2.381	6.072	2.020	3.824	3.991	1.908	136	3.812
OTC(C)	OTHER TRANSFERS FROM CONSUMERS	0	0	0	0	13	10	3	0	7	10	3
OTC(AMC)	OTHER TRANSFERS FROM CONSUMERS MPS COMMODITIES	0	0	0	0	0	0	1	1	2	3	0
EFC(C)	EXCESS FEED COSTS (FEED CROPS ONLY)	-335	-926	-958	-479	-1.271	-922	-1.574	-1.273	-703	-210	-967
CSE	CONSUMER SUPPORT ESTIMATE	2.583	8.314	3.378	2.739	6.935	1.807	3.594	4.119	1.876	-25	4.184

Source: Agrimonitor.

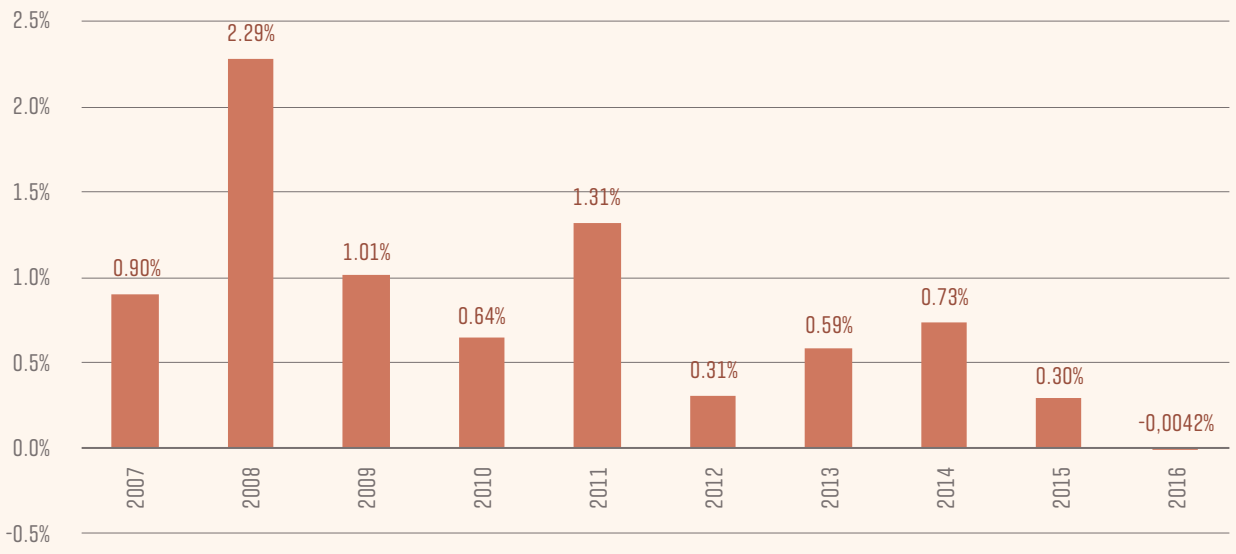
17. The Consumer Support Estimate (CSE) is the annual monetary value of gross transfers from (to) consumers of agricultural commodities, measured at the farm-gate level, arising from policy measures that support agriculture, regardless of their nature, objectives, or impacts on consumption of farm products (OECD, 2016).

The magnitude of these transfers can be put into perspective by comparing them to the average household income, in particular for "low"-income households. According to the National Institute of Statistics (INDEC), the median household income of the 10th percentile was AR$7,180/month, or AR$86,170 per year in 2012. Assuming a four-person household, and assuming that the average food consumption of this household is equal to households at other income levels, total CSE would, as mentioned above, be US$400 per year. Given an exchange rate of AR$4.78 per US dollar, the annual income of this household would be 86,170/4.78 = US$5,830, and CSE would then represent some 7 percent of annual income. A priori, for this kind of household, the reduction in domestic prices of food appears to be quite significant.

Lastly, the highly variable nature of CSE should be noted: for the years analyzed in this report, its level ranges from US$-25 million (2016) to $8.3 billion (2008). Figure 9 presents CSE as a percentage of the GDP. Clearly, in periods of high international prices, such as 2008, local consumers obtained substantial benefits from the taxation of agricultural exports.

Of course, alternative measures of consumer support (e.g., a food stamp or an income transfer program) could achieve the objective of reducing the negative impact of international price hikes while creating fewer price distortions for agricultural producers.

FIGURE 9: CSE AS A % OF GDP



Source: Agrimonitor.

VI. CONCLUSIONS

In recent decades, agriculture has been a dynamic sector of the Argentine economy. Rapid productivity growth coupled with recent increased demand for agricultural commodities makes agriculture an important sector of the economy. At the same time, the agricultural sector has been subject to a changing policy environment: periods of relative openness and macroeconomic stability have alternated with periods of high inflation and considerable restrictions on foreign trade. Despite the changing "rules of the game," the performance of agriculture has been significantly positive.

Agricultural policy in Argentina has resulted, when compared to many other countries, in few (in many cases no) programs aimed at subsidizing input prices or affecting land allocation decisions via direct payments. No programs have been in place to increase insurance use. **Environmental issues (such as deforestation, wetland preservation, or ag-chemical use) are just recently starting to be considered in the policy agenda.**

Price support and stabilization programs have also been absent in Argentine agricultural policy. Since 2007, however, different kinds of policy interventions have affected the value chain: export permits or quotas and of course export taxes have had a significant impact on the sector. An important change occurred in December 2015, resulting in the elimination and reduction of export taxes and non-tariff barriers to trade.

Transfers to and from agriculture have been estimated for the principal ten agricultural products of Argentina. Results indicate substantial transfers from agriculture to other sectors of the economy. The soybean crop accounts for a major portion of transfers from agriculture: the fact that more than 90 percent of soybeans are exported (either as grain or sub-products) implies that these transfers mostly flow from farmers to the tax collection system. For other products, for which exports represent a smaller portion of total production (e.g., beef and poultry), lower domestic prices mainly benefit consumers, and only secondarily increase tax collection.

THE AGRICULTURAL SECTOR HAS BEEN SUBJECT TO A CHANGING POLICY ENVIRONMENT: PERIODS OF RELATIVE OPENNESS AND MACROECONOMIC STABILITY HAVE ALTERNATED WITH PERIODS OF HIGH INFLATION AND CONSIDERABLE RESTRICTIONS ON FOREIGN TRADE. DESPITE THE CHANGING "RULES OF THE GAME," THE PERFORMANCE OF AGRICULTURE HAS BEEN SIGNIFICANTLY POSITIVE

An important issue to be addressed in future research relates to the "costs and benefits" resulting from taxes on exports. Clearly, export taxes distort producer incentives and in so doing introduce inefficiencies in resource allocation and production decisions. The magnitude of these inefficiencies depends on the elasticity of supply: the lower the elasticity, the smaller the resulting inefficiency. In this regard, empirical evidence suggests significant price elasticity of agricultural supply in Argentina, therefore export taxes that have been prevalent have resulted in large output losses. (Fulginiti and Perrin, 1990).

Export taxes, however, result in lower food prices for consumers and higher tax revenue for governments, important factors explaining the "political economy" of the bias toward agricultural taxation in Argentina (Kruger and Valdez, 1990; Sturzenegger and Salzani, 2008). **Designing improved ways of subsidizing food consumption for low-income households and alternative means of financing government are challenges that remain.**

Results also show increasing budgetary allocations over time to both R&D (basically INTA) as well as animal and plant health (SENASA). **In Argentina, in contrast with other countries, relatively few (if any) resources are channeled to support projects addressing environmental management, food subsidies to the low-income population, or agricultural insurance.** The analysis of the efficiency of public intervention in agriculture is an important challenge that future research should tackle in order to inform more evidence-based policymaking. The improvement of data on the different dimensions of the agricultural sector is a pressing necessity to allow such research.

THE ANALYSIS OF THE EFFICIENCY OF PUBLIC INTERVENTION IN AGRICULTURE IS AN IMPORTANT CHALLENGE THAT FUTURE RESEARCH SHOULD TACKLE IN ORDER TO INFORM MORE EVIDENCE-BASED POLICYMAKING. THE IMPROVEMENT OF DATA ON THE DIFFERENT DIMENSIONS OF THE AGRICULTURAL SECTOR IS A PRESSING NECESSITY TO ALLOW SUCH RESEARCH

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APPENDIX

Details of the calculation of **Market Price Differentials (MPDs)** for each commodity are provided below.

SOYBEANS

Table A.1 presents the calculation of the MPD and MPS for soybeans between the years 2007 and 2012. Information on the production, export quantities, and export values was obtained from the SAgroind (Secretaría de Gobierno de Agroindustria) . Domestic prices (gross producer prices) for soybeans were obtained from the Bolsa de Cereales de Buenos Aires (Grain Stock Market of Buenos Aires) database. We use the price at the Rosario port (Santa Fe province) as representative for soybean transactions. The north of Buenos Aires province and the south of Santa Fe province are the major soybean and corn production areas and Rosario is the major port in the region.

The border price (FOB price) is the annual average unit value of soybean exports (i.e., the total value of exports divided by total quantity). No quality adjustment was necessary because production, domestic consumption of soybean grains (for the crushing industry), and total exports of soybean grains are all of similar and homogeneous quality.

Marketing margins (MM) are the transportation costs from farm to main domestic market (wholesale) and main domestic market to border (reference port) plus storage and other marketing expenses. The source of this data is the agricultural magazine *Margenes Agropecuarios (Agricultural Marketing Margins)*. From the border to shipboard there are "fobbing" expenses (F) that include port and trading expenses. Port expenses are in dollars per ton and trading expenses are expressed as a percentage of the border price. The source of data for "fobbing" expenses is the Bolsa de Comercio de Rosario (Rosario Board of Trade) database.

Reference prices are FOB prices minus marketing margins and "fobbing" expenses. The resulting reference price (RP) is the border price measured at the farm-gate level in the absence of policy interventions. Domestic prices were adjusted to obtain a net

producer price (NPP). Domestic prices at the Rosario port minus the marketing margin (transportation costs plus other expenses) result in the NPP. The NPP is the price farmers receive at the farm gate including distortions from policy interventions.

To estimate Consumption in the best way possible, we have made new calculations considering beginning and ending inventories of soybean grain. Consumption is defined as C = (Production + Beginning Inventory) – (Exports + Ending Inventory). Even with this correction, Consumption for one year (2007) remains negative. We have corrected this by adding the (negative) 2007 Consumption to Beginning 2007 Inventory, with the result that the now-corrected Consumption is 0. Possible reasons for the negative Consumption result include not taking into account inventories of soybean oil (no data available). The fact that in most years only a relatively small (<15%) portion of soybean production is consumed domestically "magnifies" the impact of possible data errors on consumption figures (as mentioned above, Consumption is estimated as a residual). The MPD was obtained from the RP minus the NPP.

It is important to note that just 20 percent of the total production of soybeans is exported as grains. The other 80 percent is processed by the local crushing industry and exported as soybean oil and soybean pellets. Exports of soybean grains are subject to a 35 percent export tax, and exports of soybean oil and pellets are subject to a 32 percent export tax (30 percent and 27 percent after 2015). So, in our estimates, the Transfer from Producers to Taxes (TPT) is underestimating the total tax collection from the total soybean exports. Also, the Transfer from Producers to Consumers (TPC) overestimates the consumption subsidy. When the industry exports soybean oil and pellets, most of the calculated TPC is passed finally to tax revenue.

CORN

Information on production, export quantities, and export values reported on Table A.2 was obtained from the SAgroind. Domestic prices (gross producer prices) for corn were obtained from the Bolsa de Cereales de Buenos Aires (Grain Stock Market of Buenos Aires) database. We use the price at the Rosario port (Santa Fe province) as representative for corn transactions. The north of Buenos Aires province and the south of Santa Fe province are the major corn production areas and Rosario is the major port in the region.

The border price (FOB price) is the annual average unit value of corn exports (i.e., the total value of exports divided by total quantity). No quality adjustment was necessary because production, domestic consumption, and total exports are all of similar and homogeneous quality.

Marketing margins (MM) are the transportation costs from farm to main domestic market (wholesale) and main domestic market to border (reference port) plus storage and other marketing expenses. The source of this data is the agricultural magazine *Margenes Agropecuarios (Agricultural Marketing Margins)*. From the border to shipboard there are "fobbing" expenses (F) that include port and trading expenses. Port expenses are in dollars per ton and trading expenses expressed as a percentage of the border price. The source of data for "fobbing" expenses is the Bolsa de Comercio de Rosario (Rosario Board of Trade) database. Reference prices are FOB prices minus marketing margins and "fobbing" expenses. The resulting reference price (RP) is the border price measured at the farm-gate level in the absence of policy interventions. Domestic prices were adjusted to obtain a net producer price (NPP). Domestic prices at the Rosario port minus the marketing margin (transportation costs plus other expenses) result in the NPP. The NPP is the price farmers receive at the farm gate including distortions from policy interventions. The MPD was obtained from the RP minus the NPP.

In 2016, the estimated MPD results in a small positive value. We input MPD = 0 because no explicit support policies or import barriers were in effect.

WHEAT

Information on production, export quantities, and export values (Table A.3) was obtained from the SAgroind . Domestic prices (gross producer prices) for wheat were obtained from the Bolsa de Cereales de Buenos Aires (Grain Stock Market of Buenos Aires) database. We use the price at the Quequen port (south of Buenos Aires province) as representative for wheat transactions. The south east and south west regions of the Buenos Aires province are the major wheat production areas and Quequen is the nearest port. The border price (FOB price) is the annual average unit value of wheat exports (i.e., the total value of exports divided by total quantity). No quality adjustment was necessary because production, domestic consumption, and total exports are all of similar and homogeneous quality. Marketing margins (MM) are the transportation costs from farm to main domestic market

(wholesale) and main domestic market to border (reference port) plus storage and other marketing expenses. The source of this data is the agricultural magazine *Margenes Agropecuarios (Agricultural Marketing Margins)*. From the border to shipboard there are "fobbing" expenses (F) that include port and trading expenses. Port expenses are in dollars per ton and trading expenses are expressed as a percentage of the border price. The source of data for "fobbing" expenses is the Bolsa de Comercio de Rosario (Rosario Board of Trade) database. Reference prices are FOB prices minus marketing margins and "fobbing" expenses. The resulting reference price (RP) is the border price measured at the farm-gate level in the absence of policy interventions. Domestic prices were adjusted to obtain a net producer price (NPP). Domestic prices at the Quequen port minus the marketing margin (transportation costs plus other expenses) result in the NPP. The NPP is the price farmers receive at the farm gate including distortions from policy interventions. The MPD was obtained from the RP minus the NPP.

SUNFLOWER

Table A.4 presents the calculation of the MPD and MPS for sunflowers between the years 2007 and 2012. Information on production, export quantities, and export values was obtained from SAgroind . Domestic prices (gross producer prices) for sunflowers were obtained from *Margenes Agropecuarios* magazine. We use the price at the Rosario port (Santa Fe province) as representative for sunflower transactions. Most sunflower production is processed and exported as sunflower oil and pellets. In the Rosario area are located the major crushing industries for sunflower oil.

There are not representative exports of sunflower grains from which to obtain an observed FOB price. In consequence, we use as the border price (FOB price) the annual average price of sunflowers for crushing as published by the magazine *Márgenes Agropecuarios.* This price is adjusted for the quality requirements and marketing and processing costs of the crushing industry. This could be interpreted as an average sunflower oil and pellet price, measured in the grain equivalent.

Marketing margins (MM) are the transportation costs from farm to main domestic market (wholesale) and main domestic market to border (reference port) plus storage and other marketing expenses. The source of this data is the agricultural magazine *Márgenes Agropecuarios (Agricultural Marketing Margins)*.

From the border to shipboard there are "fobbing" expenses (F) that include port, trading expenses, and processing expenses. Port expenses are in dollars per ton and trading and processing expenses are expressed as a percentage of the border price. The source of data for "fobbing" expenses is the Bolsa de Comercio de Rosario (Rosario Board of Trade) database. Reference prices are FOB prices minus marketing margins and "fobbing" expenses (including processing costs). The resulting reference price (RP) is the border price measured at the farm-gate level, in grain equivalent and in the absence of policy interventions.

Domestic prices were adjusted to obtain a net producer price (NPP). Domestic prices at the Rosario port minus the marketing margin (transportation costs plus other expenses) result in the NPP. The NPP is the price farmers receive at the farm gate including distortions from policy interventions. The MPD was obtained from the RP minus the NPP.

To obtain the total quantity of sunflower exports in grain equivalent, we convert the exports of sunflower oil and pellets using fixed coefficients. A 0.40 transformation coefficient was used for converting grain in oil and 0.42 for grain in pellets. A final weighted average using the share of oil and pellets in the total exports was calculated to obtain the exported quantity.

As in the case of soybeans, there are under- and overestimations of transfers. Almost all sunflower production is processed by the local crushing industry, and most is exported as oil and pellets. Exports of sunflower grains are subject to a 32 percent export tax, and exports of sunflower oil and pellets are subject to a 30 percent export tax. So, in our estimates, the Transfer from Producers to Taxes (TPT) is underestimating the total tax collection from the total sunflower exports. Also, the Transfer from Producers to Consumers (TPC) overestimates the consumption subsidy. When the industry exports sunflower oil and pellets, most of the calculated TPC is passed finally to tax revenue.

BEEF

Table A.5 presents calculations for beef. Production, export, and price data were obtained from the SAgroind database. Exports were divided into two types of beef: chilled beef and Hilton quota quality beef.[18] The Hilton Quota is on average 28,000 tons per year and this type of beef is exported at a considerably higher price (two to three times) than the rest of the exported beef. The border price (FOB price) is the annual average unit value for each type of beef. The reference price is a weighted average of both types. Estimates of marketing margins and processing costs were obtained from the Bolsa de Comercio de Rosario (Rosario Board of Trade) database. Excess feed costs were estimated for the use of corn and soybean grain using data from the feed industry. In the year 2016, the calculated MPD results were negative, and we transformed them to zero because no barriers to imports were in effect.

MILK

Table A.6 presents the calculation of the MPD and MPS for milk production. Argentina is a net exporter of milk products (powdered milk, butter, and cheese), but fluid milk is not a tradable product and, in consequence, a border price is not directly observable. To derive a reference price from the border prices of representative tradable dairy products, we follow the method proposed by the OECD manual (Annex 4.1). This methodology is based on two assumptions. First, that world markets are competitive, which allows for the formation of a single price for each of the solid components of raw milk (milkfat and protein). Second, that each type of dairy product contains a unique and fixed amount of each of these components. Skim milk powder and butter were selected as tradable dairy products. These products are the majority of Argentine dairy exports.

18. The Hilton Quota is the informal name of a tariff quota for the European Union. It consists of a quota of 58,100 tons of high-quality fresh, chilled, and frozen beef. The Hilton Quota originated as part of the GATT agreements in 1979, during the Tokyo Round, organized by and held at the Hilton Hotels in Tokyo (the name of the hotel chain was used to name the specific agreements on the beef quota). The suppliers are Argentina, Brazil, Uruguay, Paraguay, the United States, Canada, Australia, and New Zealand. The Hilton Quota beef enjoys a duty preference vis-à-vis the European Union Most Favored Nation import regime. For this quota, "high quality" meat means: "Special or good-quality beef cuts obtained from exclusively pasture-grazed animals, aged between 22 and 24 months, having two permanent incisors and presenting a slaughter liveweight not exceeding 460 kilograms, referred to as 'special boxed beef', cuts of which may bear the letters 'sc' (special cuts)."

Production, export, and price data were obtained from the SAgroind . The border price (FOB price) is the annual average unit value of skim milk powder exports and butter exports (i.e., the total value of exports divided by total quantity). No quality adjustment was conducted. To complete the calculations, technical coefficients to estimate milkfat and non-fat content were obtained from internal sources of a milk processing company (SanCor Cooperatives). Excess feed costs were estimated for the use of corn and soybean grain using data from the industry and processing companies. Regarding the results, in the year 2015, the MPD was positive, even in the absence of specific supporting policies. We preserve the positive value, assuming the presence of non-tariff barriers to imports. For the year 2016, the calculated MPD results were negative and were set to zero because no specific policies (export duties or restrictions) were applied.

POULTRY

Poultru estimations are shown in Table A.7. The source for production, prices, and export data is the SAgroind database. Argentina has been a net exporter of poultry in recent years. Poultry production is for the most part vertically integrated in Argentina and, in consequence, there are no available producer prices from which to obtain prices at the farm gate. Following the OECD manual recommendations (Section 4.5), a price gap was calculated using wholesale prices instead of farm-gate prices. A constant relative price gap is the preferred option because the structural characteristics of the poultry chain are such that it is more appropriate to assume that part of the protection is captured at higher levels of the food chain. Wholesale prices and border prices were obtained from the SAgroind database. Border prices are FOB prices, calculated as the annual average unit value of poultry meat exports (i.e., the value of poultry meat exports divided by quantity).

Excess feed costs for the use of corn and soybean grain were estimated using data from the SAgroind. For poultry, we allow some MPD>0 even in the absence of subsidies or import taxes. Our rationale is that non-tariff barriers may be in effect.

PORK

Pork is the only included commodity for which Argentina is a net importer. Table A.8 presents the calculation for MPD and MPS. Production, import, and price data were obtained from the SAgroind database. Border prices are cost insurance and freight (CIF) prices, calculated as the annual average unit value of pork imports (i.e., the value of imports divided by quantity). Data on marketing margins and processing costs were not available from published sources and were estimated (from industry sources) to be 45 percent of the import price. Excess feed costs for the use of corn and soybeans were estimated using data from the Argentine Association of Pork Producers (AAPP).

COTTON

Table A.9 presents the calculation of the MPD and MPS for cotton between the years 2007 and 2016. Information on production was sourced from SAgroind, while information on export quantities and export values was sourced from the Instituto Nacional de Estadísticas y Censos (INDEC). Domestic prices for raw cotton (the Producer Price) were obtained as an average of producer prices paid by cotton gins as informed by the main cotton production provinces. Domestic prices for cotton fiber and cottonseed were obtained from the Cámara Algodonera Argentina database (based on the operations reported by its members).

The cotton border price (FOB price) is an estimated value, since the country is a net exporter of cotton and this product is not exported as such but transformed into fiber, oil, cakes, and cottonseed. The coefficients used to calculate the quantity of cotton exported assume that 100 kg of raw cotton is transformed into:

- 38 kg of cotton fiber
- 62 kg of cottonseed in turn composed of:
    - 18 kg of oil
    - 13 kg of lint
    - 37 kg of cakes

The border price for cotton is calculated as: Border Seed x 0.62 + Border Price of Fiber x 0.38. Border prices of cottonseed and fiber were estimated by dividing the value by the quantity of exports: Export Value/Export Quantity. The data source is INDEC (Instituto Nacional de Estadísticas y Censos).

Marketing margins (MM) are ginning costs, other expenses, and handling and transportation costs from farm to main domestic market (wholesale) and main domestic market to border (reference port) plus storage and other marketing expenses. The source of data is the Instituto Nacional de Tecnología Agropecuaria (INTA). From the border to shipboard there are "fobbing" expenses (F) that include port and trading expenses. Port expenses are in dollars per ton and trading expenses are expressed as a percentage of the border price. The source of data for "fobbing" expenses is the Bolsa de Comercio de Rosario (Rosario Board of Trade) database.

Reference prices are border prices minus marketing margins and "fobbing" expenses. The resulting reference price (RP) is the border price measured at the farm-gate level in the absence of policy interventions. Domestic prices were adjusted to obtain a net producer price (NPP). The producer price of raw cotton minus handling and transportation costs results in the NPP. The NPP is the price farmers receive at the farm gate including distortions from policy interventions. The MPD was obtained from the reference price minus the net producer price.

In the year 2015, MPD results were positive despite the existence of export duties. We preserve the positive value because some specific policies on cotton producers (provincial programs) can eventually increase the producer price. In the year 2016, the MPD was negative, and in the absence of explicit policy distortions (no export duties were applied), we input a zero value in calculations.

VINE

Table A.10 presents the calculation of the MPD and the MPS for vine between the years 2007 and 2016. The source of information on production was the Instituto Nacional de Vitivinicultura, and on export quantities and export values was the Instituto Nacional de Estadísticas y Censos (INDEC). Domestic prices for grapes (the Producer Price), wine, and grape must were obtained from the Bolsa de Comercio de Mendoza (Mendoza Board of Trade, based on the contracts formalized between vintners and wineries).

The border price (FOB price) has to be estimated since the country is a net exporter of vine and this product is not exported as such but transformed into wine and must. It is assumed that 100 kg of grapes are transformed into 77 kg of wine or must.

An adjustment for quality is necessary because the average quality of wine exported is higher than wine consumed domestically. Domestic consumption is mostly generic wine (lower quality), whereas most exports are varietal wine (higher quality). Quality factors determine commodity prices and cause price differentials, which may emerge independently of price policies.

The quality adjustment coefficient (QA) applied to border price is as follows:

$$QA = [\, Q_v^p p_v + Q_g^p p_g \,] \,/\, [\, Q_v^e p_v + Q_g^e p_g \,]$$

Where:

QA quality adjustment coefficient

Q^p quantities produced of varietal (v) and generic wines (g)

Q^e quantities exported of varietal (v) and generic wines (g)

p_v and p_g prices of varietal and generic wines

$$QA = \frac{BP^*}{BP} = \frac{a+b(1+Var\ P)}{c+d(1+Var\ P)}$$

$$(1 + Var\ P) = \text{quality price differential} = \frac{\text{BP (FOB Price) varietal wine}}{\text{BP (FOB Price) generic wine}}$$

a/b quantity shares of each wine type (generic and varietal wine) in total domestic production

c/d quantity shares of each wine type (generic and varietal wine) in the country's total exports

Marketing margins (MM) are vinification and processing costs and handling and transportation costs from main domestic market to border. The source of this data are the various research efforts and publications of the *Observatorio Vitivinícola Argentino*. From the border to shipboard there are "fobbing" expenses (F) that include port and trading expenses. Port expenses are in dollars per ton and trading expenses are expressed as a percentage of the border price.

Reference prices are adjusted border prices minus marketing margins and "fobbing" expenses. The resulting reference price (RP) is the border price measured at the farm-gate level in the absence of policy interventions. The MPD was obtained from the RP minus the producer price.

Results in this case show that the producer price is below the reference price (MPD negative) in the years 2007 to 2016. However, there are no specific policies such as export duties, export restrictions, or administrative barriers that explain the negative price gap. Therefore, the MPD is set equal to zero, assuming that the negative result is due to factors unrelated to agricultural policies.

APPENDIX TABLES

TABLE A.1: SOYBEANS – MPD/MPS CALCULATION

SYMBOL	DESCRIPTION	CURRENCY/UNIT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
QP	**I. LEVEL OF PRODUCTION**	000 TONS	48.800	46.200	32.000	54.500	49.000	49.000	49.300	53.500	61.447	58.799
	II. PRODUCER PRICE (AT FARM GATE)	US$/TON	217	280	254	264	316	316	312	306	239	261
PP	II.A NET PRODUCERS PRICE	US$/TON	183	243	219	213	265	265	249	243	177	199
VP	**III. VALUE OF PRODUCTION (AT FARM GATE)**	US$ MILLION	8.951	11.209	7.014	11.611	12.981	12.981	12.277	13.005	10.868	11.690
QC	**IV. LEVEL OF CONSUMPTION**	000 TONS	0	3.975	2.946	1.330	4.228	4.228	6.882	8.051	8.535	9.472
CP	**V. CONSUMPTION PRICE (AT FARM GATE)**	US$/TON	217	280	254	264	316	316	312	306	239	261
VC	**VI. VALUE OF CONSUMPTION (AT FARM GATE)**	US$ MILLION	0	1.113	747	351	1.336	1.336	2.145	2.461	2.044	2.476
RP	**VII. REFERENCE PRICE (AT FARM GATE)**	US$/TON	246	341	344	304	414	414	413	408	287	282
	1. BORDER REFERENCE PRICE	US$/TON	290	391	390	366	479	479	492	488	365	360
	2. MARKETING MARGIN	US$/TON	34	37	34	51	51	51	63	63	63	63
T1	HANDLING AND TRANSPORTATION FARM/WHOLESALE/BORDER	US$/TON	19	24	20	28	28	28	35	35	35	35
T2	STORAGE+OTHER EXPENSES	US$/TON	15	13	14	23	23	23	28	28	28	28
F	FOBBING	US$/TON	10	12	12	11	14	14	17	18	15	15
F1	PORT EXPENSES	US$/TON	4	4	4	4	4	4	7	8	8	8
F2	TRADING EXPENSES (3%)	US$/TON	6	8	8	7	10	10	10	10	7	7
MPD	**VIII. MARKET PRICE DIFFERENTIAL**	US$/TON	-63	-99	-125	-91	-149	-149	-164	-165	-110	-83
CT	**IX. MARKET TRANSFERS**	US$ MILLION	127	-177	-62	76	-253	-253	-672	-806	-664	-580
TPC	IX.1. TRANSFERS TO PRODUCERS FROM CONSUMERS	US$ MILLION	0	-393	-368	-121	-631	-631	-1.128	-1.327	-940	-790
OTC	IX.2. OTHER TRANSFERS FROM CONSUMERS	US$ MILLION	0	0	0	0	0	0	0	0	0	0
EFC	IX.3. EXCESS FEED COST	US$ MILLION	-127	-216	-307	-197	-379	-379	-456	-521	-276	-210
BT	**X. BUDGETARY TRANSFERS**	US$ MILLION	-3.063	-4.171	-3.631	-4.822	-6.687	-6.687	-6.952	-7.494	-5.826	-4.114
TPT	X.1. TRANSFERS TO PRODUCERS FROM TAXPAYERS	US$ MILLION	-3.063	-4.171	-3.631	-4.822	-6.687	-6.687	-6.952	-7.494	-5.826	-4.114
TCTC	X.2. TRANSFERS TO CONSUMERS FROM TAXPAYERS	US$ MILLION	0	0	0	0	0	0	0	0	0	0
LV	X.3. PRICE LEVIES (-)	US$ MILLION	0	0	0	0	0	0	0	0	0	0
MPS	**XI. MARKET PRICE SUPPORT (MPS)**	US$ MILLION	-3.063	-4.564	-3.999	-4.942	-7.318	-7.318	-8.080	-8.821	-6.766	-4.903
PNPC	**XII. PRODUCER NPC**	RATIO	0,75	0,71	0,64	0,70	0,64	0,64	0,60	0,60	0,62	0,70
PO	XII.1. PAYMENTS BASED ON OUTPUT	US$ MILLION	0	–	–	–	–	–	–	–	–	–
POT	XII.2. PAYMENTS BASED ON OUTPUT PER TONNE	US$ MILLION	–	–	–	–	–	–	–	–	–	–
CSCT	**XIII. CONSUMER SINGLE COMMODITY TRANSFERS (CSCT)**	US$ MILLION	-127	177	62	-76	253	253	672	806	664	580
CNPC	**CONSUMER NPC**	RATIO	0,776	0,739	0,670	0,744	0,679	0,832	0,655	0,650	0,685	0,758

TABLE A.2: CORN - MPD/MPS CALCULATION

SYMBOL	DESCRIPTION	CURRENCY/UNIT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
QP	**I. LEVEL OF PRODUCTION**	000 TONS	22.500	22.017	15.500	25.000	25.200	21.000	27.000	26.000	33.817	39.793
	II. PRODUCER PRICE (AT FARM GATE)	US$/TON	118	137	113	141	170	170	169	142	114	169
PP	II.A NET PRODUCERS PRICE	US$/TON	89	104	84	98	127	115	114	88	59	114
VP	**III. VALUE OF PRODUCTION (AT FARM GATE)**	US$ MILLION	2.010	2.285	1.297	2.445	3.191	2.414	3.079	2.277	1.980	4.517
QC	**IV. LEVEL OF CONSUMPTION**	000 TONS	7.504	6.634	4.593	7.515	9.826	2.972	7.019	10.112	17.348	15.565
CP	**V. CONSUMPTION PRICE (AT FARM GATE)**	US$/TON	118	137	113	141	170	170	169	142	114	169
VC	**VI. VALUE OF CONSUMPTION (AT FARM GATE)**	US$ MILLION	886	908	520	1.061	1.670	504	1.185	1.440	1.970	2.623
RP	**VII. REFERENCE PRICE (AT FARM GATE)**	US$/TON	115	188	152	129	226	180	222,97	154,82	115	102
	1. BORDER REFERENCE PRICE	US$/TON	150	230	189	179	279	245	290	222	181	168
	2. MARKETING MARGIN	US$/TON	29	33	29	43	43	55	54,800	54,800	55	55
T1	HANDLING AND TRANSPORTATION FARM/WHOLESALE/BORDER	US$/TON	19	24	20	28	28	35	35,000	35,000	35	35
T2	STORAGE+OTHER EXPENSES	US$/TON	9	9	10	15	15	20	20	20	20	20
F	FOBBING	US$/TON	7	8	7	7	9	10	12	12	11	11
F1	PORT EXPENSES	US$/TON	4	4	4	4	4	6	7	8	8	8
F2	TRADING EXPENSES (3%)	US$/TON	3	5	4	4	6	5	6	4	4	3
MPD	**VIII. MARKET PRICE DIFFERENTIAL**	US$/TON	-26	-85	-68	-31	-100	-65	-109	-67	-56	0
CT	**IX. MARKET TRANSFERS**	US$ MILLION	15	149	338	50	-87	482	354	72	-547	0
TPC	IX.1. TRANSFERS TO PRODUCERS FROM CONSUMERS	US$ MILLION	-193	-561	-313	-232	-979	-193	-765	-680	-974	0
OTC	IX.2. OTHER TRANSFERS FROM CONSUMERS	US$ MILLION	0	0	0	0	0	0	0	0	0	0
EFC	IX.3. EXCESS FEED COST	US$ MILLION	-208	-710	-652	-282	-892	-676	-1.118	-752	-427	0
BT	**X. BUDGETARY TRANSFERS**	US$ MILLION	-386	-1.301	-744	-539	-1.532	-1.174	-2.176	-1.069	-925	0
TPT	X.1. TRANSFERS TO PRODUCERS FROM TAXPAYERS	US$ MILLION	-386	-1.301	-744	-539	-1.532	-1.174	-2.176	-1.069	-925	0
TCTC	X.2. TRANSFERS TO CONSUMERS FROM TAXPAYERS	US$ MILLION	0	0	0	0	0	0	0	0	0	0
LV	X.3. PRICE LEVIES (-)	US$ MILLION	0	0	0	0	0	0	0	0	0	0
MPS	**XI. MARKET PRICE SUPPORT (MPS)**	US$ MILLION	-580	-1.862	-1.058	-771	-2.511	-1.367	-2.941	-1.749	-1.899	0
PNPC	**XII. PRODUCER NPC**	US$ MILLION	0,78	0,55	0,55	0,76	0,56	0,64	0,51	0,57	0,51	1,00
PO	XII.1. PAYMENTS BASED ON OUTPUT	US$ MILLION	–	–	–	–	–	–	–	–	–	–
POT	XII.2. PAYMENTS BASED ON OUTPUT PER TONNE	US$ MILLION	–	–	–	–	–	–	–	–	–	–
CSCT	**XIII. CONSUMER SINGLE COMMODITY TRANSFERS (CSCT)**	US$ MILLION	-15	-149	-338	-50	87	-482	-354	-72	547	0
CNPC	**CONSUMER NPC**	RATIO	0,821	0,618	0,624	0,821	0,630	0,723	0,608	0,679	0,669	1,000

TABLE A.3: WHEAT – MPD/MPS CALCULATION

SYMBOL	DESCRIPTION	CURRENCY/UNIT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
QP	**I. LEVEL OF PRODUCTION**	000 TONS	16.300	18.600	11.000	12.000	17.200	15.500	9.300	10.500	13.930	11.315
	II. PRODUCER PRICE (AT FARM GATE)	US$/TON	144	170	115	192	178	180	256	192	127	155
PP	II.A NET PRODUCERS PRICE	US$/TON	120	144	92	160	146	142	218	154	89	117
VP	**III. VALUE OF PRODUCTION (AT FARM GATE)**	US$ MILLION	1.963	2.681	1.013	1.921	2.508	2.207	2.030	1.620	1.240	1.329
QC	**IV. LEVEL OF CONSUMPTION**	000 TONS	6.655	9.828	5.903	8.007	9.147	4.022	6.917	8.650	9.691	1.279
CP	**V. CONSUMPTION PRICE (AT FARM GATE)**	US$/TON	144	170	115	192	178	180	256	192	127	155
VC	**VI. VALUE OF CONSUMPTION (AT FARM GATE)**	US$ MILLION	960	1.671	679	1.540	1.628	724	1.771	1.661	1.229	199
RP	**VII. REFERENCE PRICE (AT FARM GATE)**	US$/TON	175	252	163	180	260	205	250	271	187	131
	1. BORDER REFERENCE PRICE	US$/TON	209	290	196	223	305	256	303	325	238	181
	2. MARKETING MARGIN	US$/TON	24	26	23	32	32	38	38	38	38	38
T1	HANDLING AND TRANSPORTATION FARM/WHOLESALE/BORDER	US$/TON	16	20	16	24	24	27	27	27	27	27
T2	STORAGE+OTHER EXPENSES	US$/TON	8	6	7	9	9	11	11	11	11	11
F	FOBBING	US$/TON	10	13	10	11	13	13	16	16	14	12
F1	PORT EXPENSES	US$/TON	4	4	4	4	4	6	7	7	7	7
F2	TRADING EXPENSES (3%)	US$/TON	6	9	6	7	9	8	9	10	7	5
MPD	**VIII. MARKET PRICE DIFFERENTIAL**	US$/TON	-55	-108	-71	-20	-114	-63	-31	-117	-98	0
CT	**IX. MARKET TRANSFERS**	US$ MILLION	-363	-1.058	-418	-161	-1.042	-252	-217	-1.013	-950	0
TPC	IX.1. TRANSFERS TO PRODUCERS FROM CONSUMERS	US$ MILLION	-363	-1.058	-418	-161	-1.042	-252	-217	-1.013	-950	0
OTC	IX.2. OTHER TRANSFERS FROM CONSUMERS	US$ MILLION	0	0	0	0	0	0	0	0	0	0
EFC	IX.3. EXCESS FEED COST	US$ MILLION	0	0	0	0	0	0	0	0	0	0
BT	**X. BUDGETARY TRANSFERS**	US$ MILLION	-526	-944	-361	-80	-918	-720	-75	-217	-416	0
TPT	X.1. TRANSFERS TO PRODUCERS FROM TAXPAYERS	US$ MILLION	-526	-944	-361	-80	-918	-720	-75	-217	-416	0
TCTC	X.2. TRANSFERS TO CONSUMERS FROM TAXPAYERS	US$ MILLION	0	0	0	0	0	0	0	0	0	0
LV	X.3. PRICE LEVIES (-)	US$ MILLION	0	0	0	0	0	0	0	0	0	0
MPS	**XI. MARKET PRICE SUPPORT (MPS)**	US$ MILLION	-889	-2.002	-779	-241	-1.960	-973	-292	-1.230	-1.366	0
PNPC	**XII. PRODUCER NPC**	US$ MILLION	0,69	0,57	0,57	0,89	0,56	0,69	0,87	0,57	0,48	1,00
PO	XII.1. PAYMENTS BASED ON OUTPUT	US$ MILLION	–	–	–	–	–	–	–	–	–	–
POT	XII.2. PAYMENTS BASED ON OUTPUT PER TONNE	US$ MILLION	–	–	–	–	–	–	–	–	–	–
CSCT	**XIII. CONSUMER SINGLE COMMODITY TRANSFERS (CSCT)**	US$ MILLION	363	1.058	418	161	1.042	252	217	1.013	950	0
CNPC	**CONSUMER NPC**	RATIO	0,726	0,612	0,619	0,905	0,610	0,742	0,891	0,621	0,564	1,000

TABLE A.4: SUNFLOWER – MPD/MPS CALCULATION

SYMBOL	DESCRIPTION	CURRENCY/UNIT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
QP	**I. LEVEL OF PRODUCTION**	000 TONS	3.498	4.650	2.483	2.232	3.672	3.341	3.100	2.000	2.063	3.158
	II. PRODUCER PRICE (AT FARM GATE)	US$/TON	353	183	233	343	351	337	313	294	218	305
PP	II.A NET PRODUCERS PRICE	US$/TON	316	148	200	295	303	281	257	238	162	249
VP	**III. VALUE OF PRODUCTION (AT FARM GATE)**	US$ MILLION	1.106	687	495	658	1.111	940	797	476	334	786
QC	**IV. LEVEL OF CONSUMPTION**	000 TONS	1.374	2.081	280	757	2.677	2.609	1.966	1.120	817	1.263
CP	**V. CONSUMPTION PRICE (AT FARM GATE)**	US$/TON	353	183	233	343	351	337	313	294	218	305
VC	**VI. VALUE OF CONSUMPTION (AT FARM GATE)**	US$ MILLION	485	381	65	260	940	880	615	329	178	385
RP	**VII. REFERENCE PRICE (AT FARM GATE)**	US$/TON	447	251	350	518	518	468	394	318	271	271
	1. BORDER REFERENCE PRICE	US$/TON	555	331	441	649	649	602	519	434	380	380
	2. MARKETING MARGIN	US$/TON	36	35	33	48	48	56	56	56	56	56
T1	HANDLING AND TRANSPORTATION FARM/WHOLESALE/BORDER	US$/TON	21	24	21	30	30	37	37	37	37	37
T2	STORAGE+OTHER EXPENSES	US$/TON	16	11	12	18	18	19	19	19	19	19
F	FOBBING	US$/TON	72	45	58	83	83	78	69	60	53	53
F1	PORT EXPENSES	US$/TON	5	5	5	5	5	6	7	8	8	8
F2	TRADING EXPENSES (3%)	US$/TON	67	40	53	78	78	72	62	52	46	46
MPD	**VIII. MARKET PRICE DIFFERENTIAL**	US$/TON	-131	-103	-150	-223	-215	-187	-137	-81	-109	0
CT	**IX. MARKET TRANSFERS**	US$ MILLION	-179	-215	-42	-169	-576	-487	-268	-90	-89	0
TPC	IX.1. TRANSFERS TO PRODUCERS FROM CONSUMERS	US$ MILLION	-179	-215	-42	-169	-576	-487	-268	-90	-89	0
OTC	IX.2. OTHER TRANSFERS FROM CONSUMERS	US$ MILLION	0	0	0	0	0	0	0	0	0	0
EFC	IX.3. EXCESS FEED COST	US$ MILLION	0	0	0	0	0	0	0	0	0	0
BT	**X. BUDGETARY TRANSFERS**	US$ MILLION	-277	-265	-331	-329	-214	-137	-155	-71	-135	0
TPT	X.1. TRANSFERS TO PRODUCERS FROM TAXPAYERS	US$ MILLION	-277	-265	-331	-329	-214	-137	-155	-71	-135	0
TCTC	X.2. TRANSFERS TO CONSUMERS FROM TAXPAYERS	US$ MILLION	0	0	0	0	0	0	0	0	0	0
LV	X.3. PRICE LEVIES (-)	US$ MILLION	0	0	0	0	0	0	0	0	0	0
MPS	**XI. MARKET PRICE SUPPORT (MPS)**	US$ MILLION	-457	-480	-373	-498	-790	-623	-423	-161	-224	0
PNPC	**XII. PRODUCER NPC**	US$ MILLION	0,71	0,59	0,57	0,57	0,58	0,60	0,65	0,75	0,60	1,00
PO	XII.1. PAYMENTS BASED ON OUTPUT	US$ MILLION	–	–	–	–	–	–	–	–	–	–
POT	XII.2. PAYMENTS BASED ON OUTPUT PER TONNE	US$ MILLION	–	–	–	–	–	–	–	–	–	–
CSCT	**XIII. CONSUMER SINGLE COMMODITY TRANSFERS (CSCT)**	US$ MILLION	179	215	42	169	576	487	268	90	89	0
CNPC	**CONSUMER NPC**	RATIO	0,730	0,639	0,608	0,606	0,620	0,644	0,696	0,785	0,667	1,000

TABLE A.5: BEEF – MPD/MPS CALCULATION

SYMBOL	DESCRIPTION	CURRENCY/UNIT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
QP	**I. LEVEL OF PRODUCTION**	000 TONS	3.224	3.132	3.376	2.625	2.498	2.607	2.843	2.694	2.729	2.634
PP	**II. PRODUCER PRICE (AT FARM GATE)**	US$/TON	1.547	1.819	1.547	2.766	3.475	3.964	3.221	3.474	3.213	2.967
VP	**III. VALUE OF PRODUCTION (AT FARM GATE)**	US$ MILLION	4.987	5.698	5.223	7.260	8.681	10.335	9.157	9.359	8.768	7.815
QC	**IV. LEVEL OF CONSUMPTION**	000 TONS	2.927	2.901	2.993	2.458	2.354	2.498	2.710	2.555	2.598	2.481
CP	**V. CONSUMPTION PRICE (AT FARM GATE)**	US$/TON	1.547	1.819	1.547	2.766	3.475	3.964	3.221	3.474	3.213	2.967
VC	**VI. VALUE OF CONSUMPTION (AT FARM GATE)**	US$ MILLION	4.529	5.278	4.630	6.797	8.181	9.903	8.729	8.876	8.347	7.361
RP	**VII. REFERENCE PRICE (AT FARM GATE)**	US$/TON	1.868	2.967	2.091	3.069	4.315	4.055	3.506	3.549	3.124	3.150
	1. BORDER REFERENCE PRICE	US$/TON	3.947	5.884	3.972	6.477	8.254	8.615	7.658	7.173	6.607	6.707
MMcw	MARKETING MARGINS (CARCASS WEITGHT)	US$/TON	1.689	2.518	1.700	2.772	3.533	3.687	3.278	3.199	2.828	2.871
Scw	PROCESSING COSTS	US$/TON	1.444	2.154	1.454	2.370	3.021	3.153	2.803	2.735	2.418	2.455
T1cw	HANDLING AND TRANSPORTATION WHOLESALE/BORDER	US$/TON	158	235	159	259	330	345	306	299	264	268
T2cw	HANDLING AND TRANSPORTATION FARM/WHOLESALE	US$/TON	87	129	87	142	182	190	168	164	145	148
MPD	**VIII. MARKET PRICE DIFFERENTIAL**	US$/TON	-321	-1.147	-544	-303	-840	-91	-285	-75	89	0
CT	**IX. MARKET TRANSFERS**	US$ MILLION	-940	-3.328	-1.628	-746	-1.977	-227	-772	-191	231	0
TPC	IX.1. TRANSFERS TO PRODUCERS FROM CONSUMERS	US$ MILLION	-940	-3.328	-1.628	-746	-1.977	-227	-772	-191	231	0
OTC	IX.2. OTHER TRANSFERS FROM CONSUMERS	US$ MILLION	0	0	0	0	0	0	0	0	0	0
EFC	IX.3. EXCESS FEED COST	US$ MILLION	-89	-264	-239	-89	-253	-171	-315	-195	-160	-13
BT	**X. BUDGETARY TRANSFERS**	US$ MILLION	-95	-265	-209	-51	-121	-10	-38	-10	12	0
TPT	X.1. TRANSFERS TO PRODUCERS FROM TAXPAYERS	US$ MILLION	-95	-265	-209	-51	-121	-10	-38	-10	12	0
TCTC	X.2. TRANSFERS TO CONSUMERS FROM TAXPAYERS	US$ MILLION	0	0	0	0	0	0	0	0	0	0
LV	X.3. PRICE LEVIES (-)	US$ MILLION	0	0	0	0	0	0	0	0	0	0
MPS	**XI. MARKET PRICE SUPPORT (MPS)**	US$ MILLION	-946	-3.329	-1.598	-707	-1.844	-66	-495	-7	403	13
PNPC	**XII. PRODUCER NPC**	US$ MILLION	1	1	1	1	1	1	1	1	1	1
PO	XII.1. PAYMENTS BASED ON OUTPUT	US$ MILLION	–	–	–	–	–	–	–	–	–	–
POT	XII.2. PAYMENTS BASED ON OUTPUT PER TONNE	US$ MILLION	–	–	–	–	–	–	–	–	–	–
CSCT	**XIII. CONSUMER SINGLE COMMODITY TRANSFERS (CSCT)**	US$ MILLION	940	3.328	1.628	746	1.977	227	772	191	-231	0
CNPC	**CONSUMER NPC**	RATIO	0,828	0,613	0,740	0,901	0,805	0,978	0,919	0,979	1,028	1,000

TABLE A.6: MILK – IMPLICIT PRICE AND MPD/MPS CALCULATION

SYMBOL	DESCRIPTION	CURRENCY/UNIT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
QP	**I. LEVEL OF PRODUCTION**	000 TONS	9.865	10.340	10.692	10.950	11.849	12.064	11.899	11.466	11.687	10.222
PP	**II. PRODUCER PRICE (AT FARM GATE)**	US$/TON	228	261	203	319	348	329	366	356	311	253
VP	**III. VALUE OF PRODUCTION (AT FARM GATE)**	US$ MILLION	2.248	2.703	2.174	3.498	4.129	3.971	4.354	4.085	3.630	2.584
QC	**IV. LEVEL OF CONSUMPTION**	000 TONS	7.488	7.756	8.079	8.425	8.479	8.893	8.353	8.316	8.777	7.985
CP	**V. CONSUMPTION PRICE (AT FARM GATE)**	US$/TON	228	261	203	319	348	329	366	356	311	253
VC	**VI. VALUE OF CONSUMPTION (AT FARM GATE)**	US$ MILLION	1.706	2.027	1.642	2.691	2.955	2.927	3.057	2.962	2.726	2.019
RP	**VII. REFERENCE PRICE (AT FARM GATE)**	US$/TON	284	386	235	378	403	371	453	433	288	311
BPb	BORDER PRICE - BUTTER	US$/TON	2.196	3.372	1.849	3.900	4.423	3.462	4.198	4.662	3.410	3.762
BPs	BORDER PRICE - SMP (SKIM MILK POWDER)	US$/TON	3.021	3.636	2.237	3.091	3.700	3.524	4.197	4.251	2.565	2.218
a	MILKFAT CONTENT IN BUTTER	%	82	82	82	82	82	82	82	82	82	82
c	NON-FAT SOLIDS CONTENT IN BUTTER	%	2	2	2	2	2	2	2	2	2	2
b	MILKFAT CONTENT IN SMP	%	1	1	1	1	1	1	1	1	1	1
d	NON-FAT SOLIDS CONTENT IN SMP	%	95	95	95	95	95	95	95	95	95	95
e	MILKFAT CONTENT IN RAW MILK	%	4	4	4	4	4	4	4	4	4	4
f	NON-FAT SOLIDS CONTENT IN RAW MILK	%	9	9	9	9	9	9	9	9	9	9
BPm	IMPLICIT BORDER PRICE OF RAW MILK		371	478	284	450	529	471	565	589	381	364
X	IMPLICIT BORDER PRICE OF MILKFAT		2.601	4.020	2.198	4.678	5.300	4.133	5.013	5.578	4.094	4.532
Y	IMPLICIT BORDER PRICE OF NON-FAT SOLIDS		3.153	3.785	2.332	3.204	3.839	3.666	4.365	4.416	2.657	2.287
WPb	DOMESTIC WHOLESALE PRICE OF BUTTER		2.344	2.640	2.384	2.736	3.608	3.560	3.341	4.039	3.806	2.662
WPs	DOMESTIC WHOLESALE PRICE OF SMP		2.517	3.030	3.001	3.611	4.080	4.084	4.020	4.671	4.516	3.155
a	SHARE OF BUTTER PRICE IN MILK PRICE		0	0	0	0	0	0	0	0	0	0
b	SHARE OF SMP PRICE IN MILK PRICE		0	0	0	0	0	0	0	0	0	0
MM	MARKETING MARGIN (OECD)		87	92	49	72	126	101	111	157	93	54
MPD	**VIII. MARKET PRICE DIFFERENTIAL**	US$/TON	-56	-125	-32	-59	-54	-41	-87	-77	23	0
CT	**IX. MARKET TRANSFERS**	US$ MILLION	-422	-966	-260	-493	-460	-369	-729	-637	198	0
TPC	IX.1. TRANSFERS TO PRODUCERS FROM CONSUMERS	US$ MILLION	-422	-966	-260	-493	-460	-369	-729	-637	198	0
OTC	IX.2. OTHER TRANSFERS FROM CONSUMERS	US$ MILLION	0	0	0	0	0	0	0	0	0	0
EFC	IX.3. EXCESS FEED COST	US$ MILLION	-81	-228	-277	-151	-424	-266	-466	-322	-166	-83
BT	**X. BUDGETARY TRANSFERS**	US$ MILLION	-134	-322	-84	-148	-183	-132	-309	-241	66	0
TPT	X.1. TRANSFERS TO PRODUCERS FROM TAXPAYERS	US$ MILLION	-134	-322	-84	-148	-183	-132	-309	-241	66	0
TCTC	X.2. TRANSFERS TO CONSUMERS FROM TAXPAYERS	US$ MILLION	0	0	0	0	0	0	0	0	0	0
LV	X.3. PRICE LEVIES (-)	US$ MILLION	0	0	0	0	0	0	0	0	0	0
MPS	**XI. MARKET PRICE SUPPORT (MPS)**	US$ MILLION	-474	-1.060	-67	-490	-219	-235	-572	-557	429	83
PNPC	**XII. PRODUCER NPC**	US$ MILLION	1	1	1	1	1	1	1	1	1	1
PO	XII.1. PAYMENTS BASED ON OUTPUT	US$ MILLION	–	–	–	–	–	–	–	–	–	–
POT	XII.2. PAYMENTS BASED ON OUTPUT PER TONNE	US$ MILLION	–	–	–	–	–	–	–	–	–	–
CSCT	**XIII. CONSUMER SINGLE COMMODITY TRANSFERS (CSCT)**	US$ MILLION	422	966	260	493	460	369	729	637	-198	0
CNPC	**CONSUMER NPC**	RATIO	0,802	0,677	0,863	0,845	0,865	0,888	0,807	0,823	1,078	1,000

TABLE A.7: POULTRY – MPD/MPS CALCULATION

SYMBOL	DESCRIPTION	CURRENCY/UNIT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
QP	**I. LEVEL OF PRODUCTION**	000 TONS	950	1.064	1.148	1.247	1.382	1.503	1.502	1.520	1.570	1.541
PP	**II. PRODUCER PRICE (AT FARM GATE)**	US$/TON	1.267	1.328	1.226	1.301	1.400	1.840	1.977	2.017	1.935	1.820
VP	**III. VALUE OF PRODUCTION (AT FARM GATE)**	US$ MILLION	1.204	1.414	1.407	1.622	1.934	2.766	2.969	3.066	3.038	2.805
QC	**IV. LEVEL OF CONSUMPTION**	000 TONS	826	903	975	1.030	1.160	1.232	1.198	1.260	1.388	1.355
CP	**V. CONSUMPTION PRICE (AT FARM GATE)**	US$/TON	1.267	1.328	1.226	1.301	1.400	1.840	1.977	2.017	1.935	1.820
VC	**VI. VALUE OF CONSUMPTION (AT FARM GATE)**	US$ MILLION	1.046	1.200	1.195	1.340	1.624	2.268	2.368	2.541	2.687	2.466
	VII. REFERENCE PRICE (AT FARM GATE)	US$/TON	–	–	–	–	–	–	–	–	–	–
RP	1. BORDER REFERENCE PRICE	US$/TON	1.298	1.594	1.370	1.609	1.619	1.697	1.952	2.013	1.614	1.338
	WEIGHT ADJUSTMENT	RATIO	1	1	1	1	1	1	1	1	1	1
MPD	**VIII. MARKET PRICE DIFFERENTIAL**	US$/TON	-31	-266	-144	-309	-219	143	26	4	322	482
CT	**IX. MARKET TRANSFERS**	US$ MILLION	-26	-240	-140	-318	-254	177	31	5	447	654
TPC	IX.1. TRANSFERS TO PRODUCERS FROM CONSUMERS	US$ MILLION	-26	-240	-140	-318	-254	177	31	5	447	654
OTC	IX.2. OTHER TRANSFERS FROM CONSUMERS	US$ MILLION	0	0	0	0	0	0	0	0	0	0
EFC	IX.3. EXCESS FEED COST	US$ MILLION	-129	-346	-357	-219	-539	-342	-676	-560	-421	-147
BT	**X. BUDGETARY TRANSFERS**	US$ MILLION	-4	-43	-25	-67	-48	39	8	1	58	90
TPT	X.1. TRANSFERS TO PRODUCERS FROM TAXPAYERS	US$ MILLION	-4	-43	-25	-67	-48	39	8	1	58	90
TCTC	X.2. TRANSFERS TO CONSUMERS FROM TAXPAYERS	US$ MILLION	0	0	0	0	0	0	0	0	0	0
LV	X.3. PRICE LEVIES (-)	US$ MILLION	0	0	0	0	0	0	0	0	0	0
MPS	**XI. MARKET PRICE SUPPORT (MPS)**	US$ MILLION	99	64	192	-165	237	558	714	566	926	890
PNPC	**XII. PRODUCER NPC**	US$ MILLION	1	1	1	1	1	1	1	1	1	1
PO	XII.1. PAYMENTS BASED ON OUTPUT	US$ MILLION	–	–	–	–	–	–	–	–	–	–
POT	XII.2. PAYMENTS BASED ON OUTPUT PER TONNE	US$ MILLION	–	–	–	–	–	–	–	–	–	–
CSCT	**XIII. CONSUMER SINGLE COMMODITY TRANSFERS (CSCT)**	US$ MILLION	26	240	140	318	254	-177	-31	-5	-447	-654
CNPC	**CONSUMER NPC**	RATIO	0,976	0,833	0,895	0,808	0,865	1,085	1,013	1,002	1,199	1,361

TABLE A.8: PORK - MPD/MPS CALCULATION

SYMBOL	DESCRIPTION	CURRENCY/UNIT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
QP	**I. LEVEL OF PRODUCTION**	000 TONS	276	274	289	281	301	331	416	442	484	522
PP	**II. PRODUCER PRICE (AT FARM GATE)**	US$/TON	1.014	1.268	1.183	1.718	2.085	2.254	2.092	1.901	1.931	1.473
VP	**III. VALUE OF PRODUCTION (AT FARM GATE)**	US$ MILLION	280	348	342	483	627	746	871	840	935	770
QC	**IV. LEVEL OF CONSUMPTION**	000 TONS	299	295	312	314	342	354	428	450	496	550
CP	**V. CONSUMPTION PRICE (AT FARM GATE)**	US$/TON	1.014	1.268	1.183	1.718	2.085	2.254	2.092	1.901	1.931	1.473
VC	**VI. VALUE OF CONSUMPTION (AT FARM GATE)**	US$ MILLION	304	374	370	540	713	798	896	856	958	810
RP	**VII. REFERENCE PRICE (AT FARM GATE)**	US$/TON	1.190	1.656	1.275	1.733	1.768	1.833	1.840	1.973	1.744	1.621
	1. BORDER REFERENCE PRICE	US$/TON	2.164	3.011	2.318	3.150	3.215	3.332	3.346	3.587	3.171	2.948
MMcw	MARKETING MARGINS (CARCASS WEITGHT)	US$/TON	–	–	–	–	–	–	–	–	–	–
Scw	PROCESSING COSTS	US$/TON	974	1.355	1.043	1.418	1.447	1.499	1.506	1.614	1.427	1.326
MPD	**VIII. MARKET PRICE DIFFERENTIAL**	US$/TON	0	0	0	0	316	421	251	0	187	0
CT	**IX. MARKET TRANSFERS**	US$ MILLION	0	0	0	0	108	149	108	0	93	0
TPC	IX.1. TRANSFERS TO PRODUCERS FROM CONSUMERS	US$ MILLION	0	0	0	0	95	139	105	0	91	0
OTC	IX.2. OTHER TRANSFERS FROM CONSUMERS	US$ MILLION	0	0	0	0	13	10	3	0	2	0
EFC	IX.3. EXCESS FEED COST	US$ MILLION	-36	-87	-85	-51	-54	-144	-95	-196	-122	-50
BT	**X. BUDGETARY TRANSFERS**	US$ MILLION	0	0	0	0	0	0	0	0	0	0
TPT	X.1. TRANSFERS TO PRODUCERS FROM TAXPAYERS	US$ MILLION	0	0	0	0	0	0	0	0	0	0
TCTC	X.2. TRANSFERS TO CONSUMERS FROM TAXPAYERS	US$ MILLION	0	0	0	0	0	0	0	0	0	0
LV	X.3. PRICE LEVIES (-)	US$ MILLION	0	0	0	0	0	0	0	0	0	0
MPS	**XI. MARKET PRICE SUPPORT (MPS)**	US$ MILLION	36	87	85	51	149	283	199	196	213	50
PNPC	**XII. PRODUCER NPC**	US$ MILLION	1	1	1	1	1	1	1	1	1	1
PO	XII.1. PAYMENTS BASED ON OUTPUT	US$ MILLION	–	–	–	–	–	–	–	–	–	–
POT	XII.2. PAYMENTS BASED ON OUTPUT PER TONNE	US$ MILLION	–	–	–	–	–	–	–	–	–	–
CSCT	**XIII. CONSUMER SINGLE COMMODITY TRANSFERS (CSCT)**	US$ MILLION	0	0	0	0	-108	-149	-108	0	-93	0
CNPC	**CONSUMER NPC**	RATIO	1	1	1	1	1,179	1,230	1,137	1,000	1,107	1

TABLE A.9: COTTON – MPD/MPS CALCULATION

SYMBOL	DESCRIPTION	CURRENCY/UNIT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
QP	PRODUCTION	000 T	545	490	387	754	1.033	709	543	1.020	795	672
VP	VALUE OF PRODUCTION	USD MILLION	143	194	92	253	562	242	210	378	269	240
⊠P	PRODUCER PRICE OF RAW COTTON	USD/T	280	423	263	368	583	386	432	416	384	381
QC	CONSUMPTION	000 T	520	477	356	651	845	546	457	857	627	523
VC	**VI. VALUE OF CONSUMPTION (AT FARM GATE)**	USD MILLION	146	202	94	240	492	211	197	356	241	199
QX	QUANTITY OF EXPORTS	000 T	25	12	30	103	188	163	86	163	169	149
BP	BORDER PRICE	USD/T	506	684	536	773	1.097	774	749	643	492	618
VX	VALUE OF EXPORTS	USD MILLION	13	8	16	79	206	126	65	105	83	92
T1	HANDLING AND TRANSPORTATION	USD/T	18	28	26	32	38	45	45	45	45	24
T2	GINNED+OTHER EXPENSES	USD/T	196	219	198	218	232	237	224	192	193	163
F	FOBBING	USD/T	14	18	15	19	26	21	22	21	19	22
F1	PORT EXPENSES	USD/T	4	4	4	4	4	6	7	8	9	10
F2	TRADING + PROCESSING EXPENSES	USD/T	10	14	11	15	22	15	15	13	10	12
RP	REFERENCE PRICE	USD/T	277	421	297	503	801	470	458	385	234	409
PP	NET PRODUCER PRICE (FARM GATE)	USD/T	262	396	237	336	545	341	387	370	339	357
MPD	**VIII. MARKET PRICE DIFFERENTIAL**	USD/T	-15	-25	-60	-167	-256	-129	-70	-15	104	0
CT	**IX. MARKET TRANSFERS**	USD MILLION	-8	-12	-23	-126	-265	-91	-38	-15	83	0
TPC	IX.1. TRANSFERS TO PRODUCERS FROM CONSUMERS	USD MILLION	-8	-12	-21	-109	-217	-70	-32	-13	65	0
OTC	IX.2. OTHER TRANSFERS FROM CONSUMERS		0	0	0	0	0	0	0	0	0	0
EFC	IX.3. EXCESS FEED COST		0	0	0	0	0	0	0	0	0	0
BT	**X. BUDGETARY TRANSFERS**		0	0	-2	-17	-48	-21	-6	-2	18	0
TPT	X.1. TRANSFERS TO PRODUCERS FROM TAXPAYERS	USD MILLION	0	0	-2	-17	-48	-21	-6	-2	18	0
TCTC	X.2. TRANSFERS TO CONSUMERS FROM TAXPAYERS		0	0	0	0	0	0	0	0	0	0
LV	X.3. PRICE LEVIES (-)		0	0	0	0	0	0	0	0	0	0
MPS	**XI. MARKET PRICE SUPPORT (MPS)**	USD MILLION	-8	-12	-23	-126	-265	-91	-38	-15	83	0
PNPC	**XII. PRODUCER NPC**		0,95	0,94	0,80	0,67	0,68	0,73	0,85	0,96	1,44	1,00
PO	XII.1. PAYMENTS BASED ON OUTPUT		0	0	0	0	0	0	0	0	0	0
	XII.2. PAYMENTS BASED ON OUTPUT PER TONNE		–	–	–	–	–	–	–	–	–	–
CSCT	**XIII. CONSUMER SINGLE COMMODITY TRANSFERS (CSCT)**		7,81	11,85	21,46	108,84	216,55	70,38	32,11	12,85	-65,31	0,00
CNPC	**CONSUMER NPC**	RATIO	1,069	1,054	1,077	1,068	1,054	1,075	1,071	1,074	1,077	1,092

TABLE A.10: VINE - MPD/MPS CALCULATION

SYMBOL	DESCRIPTION	CURRENCY/UNIT	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
QP	PRODUCTION	000 T	2.970	2.711	2.090	2.539	2.807	2.174	2.786	2.589	2.338	1.704
VP	VALUE OF PRODUCTION	USD MILLION	647	738	672	1.271	1.475	1.194	1.252	911	795	889
PP	PRODUCER PRICE OF VINE	USD/T	218	272	322	501	525	549	449	352	340	522
QC	CONSUMPTION	000 T	2.249	1.929	1.589	2.069	2.219	1.516	2.218	2.100	1.832	1.235
CP	CONSUMPTION PRICE (AT FARM GATE)		218	272	322	501	525	549	449	352	340	522
VC	VALUE OF CONSUMPTION (AT FARM GATE)		490	525	511	1.036	1.166	833	997	739	623	644
QX	QUANTITY OF EXPORTS	000 T	721	782	501	470	588	658	568	489	506	469
BP	BORDER PRICE	USD/T	894	1.054	1.494	1.793	1.720	1.723	1.905	1.990	1.819	1.965
VX	VALUE OF EXPORTS	USD MILLION	645	824	748	843	1012	1134	1081	972	920	921
QA	QUALITY ADJUSTMENT		0,66	0,69	0,59	0,65	0,66	0,65	0,67	0,73	0,73	0,72
BP*	ADJUSTED BORDER PRICE		589	731	882	1159	1141	1120	1272	1460	1329	1417
T2	HANDLING AND TRANSPORTATION - FARM GATE TO WHOLESALE MARKET	USD/T	0	0	0	0	0	0	0	0	0	0
S	VINIFICATION+PROCESSING COSTS	USD/T	99	161	150	208	188	186	156	121	119	227
T1	HANDLING AND TRANSPORTATION - BORDER TO WHOLESALE MARKET	USD/T	89	105	149	179	172	172	190	199	182	197
F	FOBBING	USD/T	22	26	37	45	43	43	48	50	45	49
RP	REFERENCE PRICE	USD/T	378	439	545	727	738	719	878	1.091	982	944
NPP	NET PRODUCER PRICE (FARM GATE)	USD/T	218	272	322	501	525	549	449	352	340	522
MPD	MARKET PRICE DIFFERENTIAL	USD/T	0	0	0	0	0	0	0	0	0	0
CT	MARKET TRANSFERS	USD MILLION	0	0	0	0	0	0	0	0	0	0
TPC	TRANSFER FROM PRODUCERS TO CONSUMERS	USD MILLION	0	0	0	0	0	0	0	0	0	0
OTC	OTHER TRANSFERS FROM CONSUMERS	USD MILLION	0	0	0	0	0	0	0	0	0	0
EFC	EXCESS FEED COST	USD MILLION	0	0	0	0	0	0	0	0	0	0
BT	BUDGETARY TRANSFERS	USD MILLION	0	0	0	0	0	0	0	0	0	0
TPT	TRANSFER FROM PRODUCERS TO TAXES	USD MILLION	0	0	0	0	0	0	0	0	0	0
TCTC	TRANSFERS TO CONSUMERS FROM TAXPAYERS	USD MILLION	0	0	0	0	0	0	0	0	0	0
LV	PRICE LEVIES (-)	USD MILLION	0	0	0	0	0	0	0	0	0	0
LVO	PRICE LEVIES BASED ON OUTPUT(-)	USD MILLION	0	0	0	0	0	0	0	0	0	0
MPS	MARKET PRICE SUPPORT	USD MILLION	0	0	0	0	0	0	0	0	0	0
PNPC	PRODUCER NPC	RATIO	1	1	1	1	1	1	1	1	1	1
PO	PAYMENTS BASED ON OUTPUT	USD MILLION	0	0	0	0	0	0	0	0	0	0
POT	PAYMENTS BASED ON OUTPUT PER TONNE	USD MILLION	0	0	0	0	0	0	0	0	0	0
CSCT	CONSUMER SINGLE COMMODITY TRANSFERS (CSCT)	USD MILLION	0	0	0	0	0	0	0	0	0	0
CNPC	CONSUMER NPC	RATIO	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0

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