INTERNATIONAL
FOOD POLICY
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IFPRI Discussion Paper 01892

December 2019

Looking at Export Tariffs and Export Restrictions

The Case of Argentina

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CONTENTS

ABSTRACT	iii
ACKNOWLEDGMENTS.....	iii
1. INTRODUCTION	1
2. PREVIOUS WORK	2
3. ARGENTINA EXPORT DUTIES	5
Impact of export barriers on internal prices	7
Impact on crop area and total production	10
Impact on exports	12
4. METHODOLOGY	15
Dataset	15
5. THE MIRAGRODEP GLOBAL COMPUTABLE GENERAL EQUILIBRIUM MODEL	17
General features	17
Key assumptions.....	19
6. SCENARIOS.....	20
7. RESULTS.....	20
Macro variables	21
Change in domestic prices—changes in income (welfare and household income)	23
Production by sector (production and employment)	23
Fiscal accounts	25
Other closures for the government accounts	25
Tax differential in the oilseed value chain	26
8. CONCLUSIONS.....	28
REFERENCES	30
APPENDIX 1: Agricultural export duties in Argentina, 2015.....	32
APPENDIX 3: Export restrictions in the model.....	34
How to model the distortions	34
Calibration modification.....	34

ABSTRACT

Export taxes have been used in many countries. The 2007–2008 food price crisis shed light on export policies' dangerous consequences for food security during periods of price spikes. Some countries, and Argentina in particular, implemented export taxes for almost all tariff lines in those years.

During the past 15 years, several papers have been written on the impact of export duties and other barriers to exports in Argentina. The area of analysis (poverty, employment, public revenues, and so on) and the methodology have varied in each case. However, most of the literature is based on partial equilibrium frameworks or does not consider dynamic effects for projections of the most important economic variables (such as gross domestic product, or GDP; exports; agricultural production; and employment). Additionally, most of those studies were done in the first decade of the new millennium, when food prices and the evolution of trade and global growth were different from their current context.

In December 2015, the new Argentine government repealed taxes on exports of agro-industrial goods, except for soybeans (and their by-products), on which an initial reduction of 5 percentage points was established. Likewise, the government also eliminated the quantitative restrictions that existed for some products until that moment.

Based on these changes in legislation, this study aims to analyze the impact of changes in export duties and export restrictions on Argentina's economy, measuring their impact on different economic variables. The scenario also includes the elimination of other nontariff barriers to export. The paper finds that export taxes and restrictions in Argentina do affect world prices and the country's terms of trade, and that their removal leads to declines in the world prices of the products involved (negatively affecting producers of similar products in other countries but benefiting consumers). Second, the removal of export taxes and restrictions leads to some increases in GDP and welfare in Argentina, but with a variety of effects on productive sectors: those benefiting from the policy reduction increase, but the rest tend to contract. Third, the reduction in export taxes increases the government's deficit and negatively affects investment, through a crowding-out effect. To avoid the latter effect, another simulation considers the level of a compensatory increase in the consumption tax. Fourth—and contrary to the idea that the elimination of the export tax differential in the oilseeds value chain would lead to a decline in the production of the processed products (such as soybean oil)—the simulations show that when the elimination of the differential is combined with an overall reduction of export taxes, both primary and processed products of the same item expand.

In September 2018, in the midst of financial needs, the Argentine government once again imposed export duties on all goods and services. However, given the scope of this work, the implications of that action were not included in this paper and will be included in a new version of it.

Key words: Argentina, food prices, export taxes, export restrictions, WTO

ACKNOWLEDGMENTS

This work was undertaken as part of, and funded by, the CGIAR Research Program on Policies, Institutions, and Markets (PIM), led by the International Food Policy Research Institute (IFPRI). The opinions expressed herein belong to the authors and do not necessarily reflect those of PIM, IFPRI, or the CGIAR.

1. INTRODUCTION

Export taxes have been used in many countries. They have multiple effects, including on the terms of trade (resulting from the market power of key suppliers), on the reduction and stabilization of consumer prices (which influence food security) or of intermediate input prices (which may affect in different ways the processed goods using them), on government revenues, and on income distribution. These taxes can also create serious negative externalities for trade partners and affect long term investment and innovations in the targeted sectors. Recent years have been marked by a renewal of interest in this issue from the trade community. The 2007–2008 food price crisis shed light on export policies' dangerous consequences for food security during periods of price spikes (Anderson and Martin 2011; Bouët and Laborde 2011).

At the end of 2015, the new Argentine government repealed taxes on exports of agro-industrial goods, except for soybeans (and by-products), with an initial reduction of 5 percentage points. At the same time, the current administration also eliminated export duties for other industrial goods (most of which had a rate of around 5 percent) but retained them on fossil fuels and other specific mineral products. In a subsequent decision, the export tax on fossil fuels was eliminated. As for the soybean complex, a yearly reduction of 5 percentage points until 2021 was announced. In October 2016, however, it was decided not to implement the scheduled tariff reduction for the oilseed complex in 2017. Decree 1343/2016 in early 2017 established a 0.5 percentage point monthly reduction, starting in January 2018 and reaching an export tax rate of 18 percent in December 2019.

However, in September 2018 the tariff reduction scheme was modified again. By Decree No. 793/2018 (*Official Gazette of the Republic of Argentina* 2018), an emergency tax on exports was implemented for the entire basket of goods, applying an additional rate of 12 percent of the free on board value. In this case, mobile export duties were set, since the 12 percent of the imposition cannot exceed 3 Argentine pesos (AR\$3) per US\$1 for manufactured goods, or AR\$4 per US\$1 for primary goods.

In this way, those products that were already taxed, such as soybeans and their by-products, saw export taxes increased by 12 percent (thus, soybeans raised their export tax payments to around 29 percent, depending on the exchange rate). The same decree also advanced the scheme of reduction of export tax rate for soybeans and vegetable oils, which is expected to reach 18 percent and 15 percent, respectively, by December 2019. Under the new regime, 12 percent is added (but not more than AR\$3 or AR\$4 per US\$1) to the previous tax rate (the duty rate now is about 29 percent for soybeans and 26 percent for oil).

In addition, export duties were also applied for services (previously excluded), with a 12 percent duty, but not higher than AR\$4 per US\$1, applicable only to exports exceeding US\$600 million per year (Decree No. 1201/2018, *Official Gazette* 2018). In both cases (goods and services), the measure was fixed on a transitory basis, until December 31, 2020.

Based on the previous changes in legislation, this study aims to analyze the impact of changes in agricultural export duties on Argentina's economy, measuring its impact on different economic variables. The scenario also includes the elimination of other nontariff barriers (NTBs) on agricultural exports. Due to the progress of the work, the recent reimplementation of export rights has not been incorporated in this analysis, although it will be included in subsequent updates. Nevertheless, the purpose of this paper is to show the effect of export duties on certain economic macro variables, so that the exercise carried out fully complies with the objective.

However, our analysis has its limitations, since the scope of this exercise involves a wide range of situations regarding export tax policies. We consider export taxes to be fixed and removed exogenously, independent of the level of world prices and the actions of other countries. By doing so, we eliminate strategic interactions. We discuss other aspects of our framework below.

2. PREVIOUS WORK

During the past 15 years, several papers have been written on the impact of export duties and other barriers to exports in Argentina. The area of analysis (poverty, employment, public revenues, and so on) and the methodology have varied in each case. However, most of the literature has utilized a partial equilibrium framework. Those studies that used economywide models focused on comparative statics in the short term, not including medium-term projections for the most important economic variables (such as gross domestic product, or GDP; exports; agricultural production; and employment). Additionally, most of those studies were done during the first decade of the new millennium, when food prices and the evolution of trade and global growth were different from their current context.

Here we briefly review several of the main studies. Sturzenegger (2007), using econometric estimates with data on prices and the exchange rate since 1960, showed that export duties were higher when there were increases in relative prices benefiting the products taxed and when the multilateral exchange rate moved in favor of exports. In Sturzenegger's analysis, then, export duties moved to compensate increases in agricultural profitability.

Di Gresia and colleagues (2006), based on the Argentina Permanent Household Survey, analyzed the impact of the elimination of export taxes on poverty and indigence. Using the valuation of the basic food basket, they calculated the impact on poverty of increased prices resulting from the elimination of export duties. The result estimated that a total elimination of export duties would generate 1.2 million new poor, increasing the poverty rate from 20.5 percent to 25.6 percent. However, it should be mentioned that this study measured only the direct effects in the short term, excluding the adjustments on other economic sectors, which

could reverse, at least in part, the direct impact of the export taxes on poverty (Ivanic and Martin, 2014).¹

Nogués and colleagues (2007) used a partial equilibrium model to analyze the effects of trade policies on Argentina's agro-industrial sectors. They estimated that elimination of export taxes would increase aggregate agro-industrial value-added by about 32.6 percent, increase GDP by between 2 and 4 percent (under the partial equilibrium assumption that the non-agro-industrial GDP stays the same), and lead to an expansion of employment by 300,000 jobs in the agro-industrial sector and related activities (there is no general equilibrium analysis of total employment). Then they utilized a simple elasticity approach to tie GDP growth to poverty reduction, estimating that the incidence of poverty, after increasing on impact, would decline after about two years by a range that fluctuates between -1.4 and -6.9 percent (but extreme poverty, or indigence, would increase).

In particular, the results of Nogués and colleagues (2007) showed that elimination of export barriers would increase production and employment levels of primary agriculture more than it would increase those levels in the processing stages of the agro-industrial chains. This is because differential export taxes—higher tax levels for primary than for industrial producers—increase effective protection of the processing stages to the detriment of primary producers. Therefore, the elimination of these barriers would have a more positive impact on the primary producers than on the industrial sectors.

Deese and Reeder (2007) used an equilibrium displacement model to simulate the effect of changes in export taxes on soybean products. The results showed that removing export taxes on soybean oil and meal, but continuing the tax on soybeans, would cause exports of meal and oil to rise and exports of soybeans to fall. Exports of each product would increase when taxed uniformly at 10 percent. Removal of the taxes on all soybean products would increase exports of each product. This work also showed that Argentine export taxes on soybeans, soybean oil, and soybean meal reduced the quantity of exports by about 4.5 percent for each product. This reduction in the quantity of exports increases the world price of soybeans.

Bouët, Estrades, and Laborde (2014) performed a partial equilibrium analysis on export duties on the soybean value chain for Argentina and other countries that produce and consume primary and processed oilseeds. According to their estimates, Argentina's overall welfare will decline by about US\$900 million because the losses for consumers and for government revenue are larger than the welfare increases for producers. In fact, for the latter, the elimination of export taxes is expected to augment both production in the first stage of the value chain and exports. But also, production of soybean meals and oils increases, showing that the potential negative impact on production of the elimination of the

¹ In a sample of developing countries, Ivanic and Martin found that poverty increases from the impact of food price increases but that those price changes in the long run could be favorable to the poor when there are also increases in wages for unskilled workers resulting from higher food prices. Two exceptions are female-headed households (where wages may not go up as much as very large food price increases) and urban households. These are simulated results based on estimates of the elasticity of wages with respect to food prices.

differential export tax on processed products is more than compensated by the positive influence of the increase in the production of the primary product, which, as an input in the production of the processed product, helps expand production of the processed product as well.²

The same authors published another paper (Bouët, Estrades, and Laborde 2013) using a detailed global dataset on export taxes (GTAP7.1) and the MIRAGE global computable general equilibrium model to assess the impact of export taxes on the world economy. The authors found that if all export taxes (that is, not only those on agricultural products) in the world were removed, global welfare would increase by 0.23 percent. However, they found that some countries, such as Argentina, could experience income losses because of terms-of-trade effects. Still, for Argentina, 80 percent of the national income losses would come from the removal of taxes on the oil and mining sectors.

Cicowiez, Díaz-Bonilla, and Díaz-Bonilla (2009, 2010) studied the economic, poverty, and income inequality impacts of both world and domestic trade reform in Argentina, with a special focus on export taxes, using a computable general equilibrium (CGE) model and microsimulations. In this work, the authors showed that GDP would decrease by 1.7 percent in the case of elimination of all export taxes in Argentina, and by 0.9 percent in the case of elimination of only agricultural export taxes. This result derives from the interaction of an appreciating exchange rate, the primarization of agro-industrial production, and the negative impact on industries using as inputs primary commodities that now increase in value. In these simulations, the decline in GDP generated by the elimination of export taxes results from the negative impact on nonagricultural GDP, outweighing the positive impact on agricultural value-added following the change in relative prices. The shift of incentives toward agriculture affects production in other sectors through the usual general equilibrium effect of taking capital and labor away from them. A consequence of the export orientation of agricultural products in Argentina is that food consumption by households declines in all scenarios when export taxes are eliminated. These papers also showed that unemployment increases in most of the simulations that include the elimination of export taxes, with the exception of the scenario that combines complete own liberalization with liberalization in the rest of the world for all products (but not when that scenario covers only agricultural products). The model used in this paper, however, does not include the medium- to long-term dynamic effects on production and technological innovation that may result from policy reforms.

Nogués (2011), and Regúnaga and Tejeda Rodríguez (2015) quantified the impacts that the export taxes and NTBs on exports have had on domestic producer and consumer prices in Argentina. The analysis concluded that quantitative export restrictions have reduced producer prices nearly as much as the high export taxes. Additionally, the producer price effects produced by these restrictions have been more unstable than those related to either

² Bouët, Estrades, and Laborde's (2014) simulations also showed a small reduction in the production of biofuels (-0.4 percent in volume) because in the baseline there is an important export tax differential between soybean oil (the input) and biodiesel (the output).

international prices or export taxes. At the consumer level, the analysis shows that for several products the correlations between producer and consumer prices are low or close to nil. These authors' conclusions emerging from these dual effects—the serious impact of export barriers on producer prices and their low impact on consumer prices—is that export barriers have failed to achieve the primary objective of securing low prices to local consumers, and this failure has come at a high price in terms of forgone agricultural output.

3. ARGENTINA EXPORT DUTIES

Export duties in Argentina were imposed horizontally in almost all exports, including agricultural products (where they were particularly high), metal raw materials and other minerals, hides and skins, oil and natural gas, capital goods, and oil derivatives, among other goods. Export taxes, other things being equal, have an “inverse tariff escalation structure”: raw materials are taxed higher than processed goods, which provides a cost incentive to the domestic industry and keeps internal prices relatively low.

Under the Argentine legislation, export duties were used as price policy tools—to soften the impact of exchange rate fluctuations on domestic prices, especially those of key products in the consumption basket of families³—and as a fiscal measure, depending on the situation of the public finances.⁴ Moreover, the Argentine government considered export duties to be a valid development tool, to counter the import tariff escalation that existed in many importing countries, forcing exporting countries to be mere suppliers of raw materials.⁵

The tax base for calculating the duty was generally the free on board (FOB) value less the cost, insurance, and freight (CIF) value of the imported goods incorporated in the product exported. For some agricultural products (included in Law No. 21.453/1976), the basis of calculation was the tax base (index price, FOB value, or minimum or equivalent FOB value) in force on the closing date of each sale,⁶ or the “official price.”⁷

Export taxes were reimplemented to temporarily support public funds in the Argentine crisis of 2001 and to counteract the increase in prices resulting from the currency devaluation (of the Argentine peso). Despite being announced as temporary, they were not eliminated and became important for public finances and as a feature of Argentina's trade policy in the last 15 years.

Since 2002, all Argentine exports, with the exception of some dairy products (34 eight-digit tariff lines), have been subject to export duties,⁸ and some export duties in agricultural products increased after that date. According the World Trade Organization (WTO), in 2012, rates varied between 5 and 100 percent, whereas in 2006 the maximum rate was 45

³ Resolution No. 11/2002 of the former Ministry of the Economy and Infrastructure (*Official Gazette*).

⁴ Resolution No. 35/2002 (*Official Gazette*).

⁵ WTO document WT/MIN(11)/ST/19 of December 16, 2011.

⁶ Law No. 21.453 of November 11, 1976 (as amended) (*Official Gazette*).

⁷ MECON (2012).

⁸ Resolution No. 11/2002 of the former Ministry of the Economy and Infrastructure (*Official Gazette*).

percent. The 5 percent rate was the general rate and applied to 97.5 percent of the tariff universe. The other rates applied were 10 percent, 13 percent, 15 percent, 20 percent, 23 percent, 30 percent, 32 percent, 35 percent, 40 percent, 45 percent, and 100 percent, depending on the goods. The 100 percent rate, which did not exist in 2006, applies to natural gas (HS 2711.11.00 and HS 2711.21.00). In general, export duties were ad valorem; however, the export duty for crude oil is calculated in base on the international price of oil.

At the same time, there are some special regimes as far as export duties are concerned. For example, exports for consumption in free zones are subject to an export tax equivalent to 15 percent of that which prevails in the general customs territory.⁹ The mining enterprises that qualify for the mining investment regime benefit from fiscal stability, and this regime also includes export levies. At the same time, some goods or types of goods are exempt from export duty. This applies, for example, to goods imported temporarily and incorporated into exports;¹⁰ material intended to advertise tourism and the holding of fairs and exhibitions; and goods, up to a limit of US\$2,000, carried personally by travelers on their way to Mercosur countries, provided the corresponding commercial invoice can be produced.

The importance of export duties for Argentina's finances can be seen in Table 3.1. From 2006 to 2015, the tax revenue from export duties has increased progressively to reach AR\$75,939 million in 2015 (almost US\$7,900 million at the official exchange rate of that year).

Table 3.1: Export duties, 2006–2015

Export duties	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total collected (AR\$ million)	14,712	20,450	36,055	32,042	45,547	54,163	61,315	55,465	84,088	75,939
Annual growth rate (%)	19.4	39.0	76.3	-11.1	42.1	18.9	13.2	-9.5	51.6	-9.7
As a percentage of total tax revenue	9.8	10.2	13.4	10.5	11.1	10.0	9.0	6.5	7.2	4.9

Source: Authors, based on AFIP (2016).

However, since 2010, the importance of export duties in Argentina's tax receipts has dropped significantly, representing 13.4 percent of revenue in 2008, 11 percent in 2010, 6.5 percent in 2013, and finally, less than 5 percent in 2015 (4.94 percent) (AFIP 2016). In our model, this share in the base year is 7.4 percent, close to the average value for the 2011–2015 period.

During the whole period, the incidence of agro-industrial exports on the total collection obtained for export duties was very significant. As an example, in 2014, the collection for export duties on agro-industrial goods reached AR\$64,601 million (on a total of AR\$84,088 million), representing 76.8 percent of total tax revenue for this concept. Within the sector, soybeans and their by-products accounted for 4.5 percent of export duties (just over

⁹ Article 49 of Law No. 24.331 of June 17, 1994 (*Official Gazette*).

¹⁰ Resolution No. 530/2002 (*Official Gazette*).

AR\$53,000 million) (AFIP 2016). However, not all the measures put in place generated additional fiscal revenue for the government, but many were simply aimed at reducing internal consumer prices. The quantitative restrictions on the export of grains, meat, and dairy are a clear example of this.

Besides fiscal considerations, the other reason that has been already mentioned to justify the imposition of differential export taxes (that is, imposing higher taxes on the primary sector compared with agro-industry) is the compensation of domestic producers for the tariff escalation used by other countries.¹¹

Last, export taxes on oil and gas were imposed, having the effect of keeping “low” the domestic prices of fuel and fertilizers, which are two major inputs for the production of agricultural commodities.

Impact of export barriers on internal prices

In general, agricultural policies implemented in the last decade in Argentina have had the effect of reducing domestic prices received by the producer, compared with corresponding export prices. The latter were reduced not only by the effect of taxes on exports, but also by export restrictions and other trade controls.

Figure 3.1 shows the evolution of the differences between the prices received by the producer and the FOB prices in Argentina for wheat in the period 2007–2014. We can observe a difference between the FOB price and the theoretical free alongside ship (FAS) price. This difference is the result of the impact of export taxes and quotas. This lower price received by the producer resulted in an extraordinary margin for the exporter (or industrial), above their costs and normal margins.

¹¹ On this view, see the pioneer work of Balassa (1965, 1967, 1968), showing the negative impact that tariff escalation in developed countries has on exports of processed products from developing countries.

Figure 3.1: Evolution of export prices of domestic wheat in Argentina, 2007–2014, US dollars per metric ton

Source: Regúnaga and Tejeda Rodríguez (2015).

Note: FAS = free alongside ship; FOB = free on board.

We can also see in Figure 3.1 the exceptional situation for some months in 2013, due to a circumstantial shortage of supply (as a result of the decline in planted wheat area and serious quality problems that prevented allocating all production for human consumption) that originated short-term insufficiency of wheat to make bread in the domestic market. For this reason, producer prices of good-quality wheat increased significantly during that period and were above the international reference price.

Meanwhile, in Figure 3.2, we can see what happened in the case of corn. Almost throughout the period under review, the price received by the producer was less than the theoretical FAS (except for a few months), although the margins were less than the ones received in the case of wheat.

Figure 3.2: Evolution of export prices of domestic corn in Argentina, 2007–2014, US dollars per metric ton

Source: Regúnaga and Tejeda Rodríguez (2015).

Note: FAS = free alongside ship; FOB = free on board.

In Table 3.2, we can see more clearly the difference between the export price and the price received by producers at the port of shipment for wheat, corn, and soybeans. As seen there, the data show the discount applied as a result of export taxes, as well as the combined impact of these taxes with the NTBs to exports and shipping costs.

Table 3.2: Impact of export taxes and NTBs to wheat, corn and soybeans, in equivalent ad valorem free on board price in Argentine ports, 2007–2012

Year	Export taxes (%)			Total export discount (%)**			Tax share in the total discount (%)		
	Wheat	Corn	Soy	Wheat	Corn	Soy	Wheat	Corn	Soy
2007*	21%	21%	28%	44%	25%	30%	48%	84%	94%
2008*	30%	26%	38%	45%	31%	38%	65%	83%	100%
2009	23%	20%	35%	35%	31%	37%	65%	65%	94%
2010	23%	20%	35%	37%	31%	36%	62%	64%	97%
2011	23%	20%	35%	47%	42%	37%	49%	48%	95%
2012	23%	20%	35%	39%	37%	34%	58%	54%	100%

Source: Regúnaga and Tejeda Rodríguez (2015).

Note: * During different months of 2007 and 2008, the aliquots were modified. ** The total savings include the effects of export taxes, nontariff barriers, and shipping costs.

While in soybeans the difference between the export price and the price received by producers is largely explained by export taxes, in the case of maize and wheat, NTBs to exports have played an important role. The NTBs to exports have caused the discount on the domestic price of these products to be higher than that on soybeans, even when export duties on corn and wheat were up to 15 percentage points lower than those for oilseeds.

The NTBs to export put in place in Argentina include many less obvious costs associated with frequent changes of market regulations and the granting of export permits (known by their Spanish acronym, ROEs); increase in administrative burden arising from regulations; the risk of sanctions for alleged breaches of some bureaucratic requirements; and the financial costs associated with excessive delays in the reimbursement of taxes (value-added tax and export refunds).

Impact on crop area and total production

Despite the restrictions, total production grew at an annual rate of 3.5 percent between 2000/2001 and 2013/2014, evolving from 64 to 105 million tons¹² between these two harvests.¹³ The main source of growth was not the yield per hectare but the increase in planted area, at a rate of 2.5 percent per year (Figure 3.3). However, the restrictions on exports implied that Argentine agricultural production had less dynamism than that of other producing countries during the years 2007–2014.¹⁴ During that period, the production of soybeans, and corn, grew, with some exceptions, at a slower rate than in Brazil, Australia, the United States, and Ukraine, while wheat and beef production actually declined (see Appendix 2 for detailed information).

Figure 3.3: Evolution of cultivated area and grain production in Argentina, 2000/2001–2013/2014, millions of hectares and millions of metric tons

¹² All tons are metric tons.

¹³ The strong devaluation in early 2002 and then the recovery in world prices since the middle of that same decade helped to support production.

¹⁴ After new quantitative restrictions were imposed in 2006 (ROEs) and export duties were increased in 2007. For example, soybean export duties rose from 23.5 to 27.5 percent in January 2007 (Res. 10/2007 of the Ministry of Economy, *Official Gazette*) and from 27.5 percent to 35 percent in November 2007 (Res. 369/2007 of the Ministry of Economy, *Official Gazette*).

Source: Regúnaga and Tejeda Rodriguez (2015).

The increase of the planted area was due partially to the extension of the agricultural frontier through the use of new lands, but also to a more intense use of the land through double cropping, which allows the harvest of more than one crop per year. The success of this system in Argentina was largely due to the expansion of no-till farming and to the introduction of glyphosate-resistant soybeans during the 1990s. No-till farming significantly reduced the tillage times between harvests, which allowed two, and even three, crops to be harvested in one year.

Figure 3.3 shows that production increased strongly during the first eight seasons (2000/2001 through 2007/2008) of the period studied, at a rate of 4.8 percent annually. But, once export restrictions were increased in the season 2007/2008, the growth in total grain production slowed to 2.7 percent annually.¹⁵ We can observe a pattern of slower or even negative growth in other activities, such as beef and dairy.

It is worth mentioning that since 2007, a growing appreciation of the real exchange rate is also observed (by a devaluation lower than that of the inflation rate), which also affected profit margins and growth in the agricultural sector. Soybeans led the growth of grain production, doubling its production during the period (up by 4.6 percent annually). Corn production also increased, but at a slower pace, to 25 million tons in the 2013/2014 harvest. However, wheat production fell from 16 million tons in 2000/2001 to 10 million in 2013/2014.

The growing importance of oilseeds in Argentina's productive structure is noted in the evolution of the planted area. During the period 2000/2001–2013/2014, the surface with oilseeds grew significantly; however, the area with cereals did not register a growing trend during those 13 harvests (Figure 3.4). This is attributable to the increased profitability of soybeans, its lower cost of planting and cultivation, and the reduced uncertainty associated with government interventions (because soybeans were not subject to the NTBs to exports that were applied to wheat and corn).

¹⁵ An important negative factor for production was the severe drought in 2008/2009.

Figure 3.4: Evolution of cultivated area with cereals and oilseeds, 2000/2001–2013/2014, millions of hectares

Source: Regúnaga and Tejeda Rodríguez (2015).

In particular, the share of soybeans recorded a significant increase in the composition of the area planted, even as grains evolved from 45 percent to 65 percent of the total area between 2000/2001 and 2013/2014. The area under soybeans increased by about 720,000 hectares per year during that period, exceeding 20 million hectares in 2013/2014. On the other hand, wheat was the crop that recorded the biggest loss of planted area (250,000 hectares per year), falling from 6.5 million hectares in 2000/2001 to 3.6 million hectares in 2013/2014.

At the same time, other major crops such as corn and sunflowers, lost share in the cultivated area, falling from 23 percent of the planted area in 2000/2001 (added together) to 16 percent during the 2013/2014 harvests. The exception was barley, which as a result of restrictions on the market of wheat, partially replaced this cereal and tripled its sown area between 2007/2008 and 2013/2014 from 1 percent to 4 percent.

Impact on exports

Exports were also affected by the policies implemented. Figure 3.5 shows the evolution of exports of the main cereals and oilseeds. While corn and other cereals (mainly thanks to barley exports) show a positive evolution in recent years, soybeans and wheat have been declining. This is particularly the case of wheat, which shows a downward trend since 2003 (briefly interrupted in 2012) and reached historic lows in 2014, with exports below 2 million tons.

Figure 3.5: Evolution of Argentine exports of grains, 2001–2014, thousands of metric tons

Source: Authors, based on data from UN Comtrade.

However, despite the drop in volume, soybeans remain the larger export product in value within this group of primary crops, with US\$3.7 billion (40 percent of sales of grains and oilseeds) in 2014.

Meanwhile, products directly derived from agricultural production, such as oils, have also shown a negative evolution in recent years. Particularly, Figure 3.6 shows the drop in exports of soybean oil, down 36 percent from its peak period (2007), although it still amounts to about US\$3.4 billion.

Figure 3.6: Evolution of Argentine exports of vegetable oils, 2001–2014, metric tons

Source: Authors, based on data from UN Comtrade.

Despite the significant drop in soybean oil exports, the crushing of soy maintained a more stable evolution (Figure 3.7), and after a small drop in 2008 and 2009, by 2010 had already recovered the levels of 2007. This was related to the fact that after legislation supporting the production of biofuels was implemented (Law No. 26,093), a substantial part of the soybean oil was earmarked for the production of biodiesel (Figure 3.7). That legislation established a regime for the promotion of investments and the use of biofuels in the domestic market. In particular, it established the obligation to combine fossil fuels with biofuels (initially, in 2010, the minimum cut was a 5 percent blend, up to 10 percent today).¹⁶

Figure 3.7: Evolution of Argentine soybean crushing and biodiesel production, 2008–2014, metric tons*

Source: Authors, based on data from Agroindustry Ministry (2017) and INDEC (2016).

* INDEC's production statistics begin in 2008.

In the case of meat, we can see two different and well-defined trends (Figure 3.8). On the one hand, there was a sharp contraction in exports of beef, a direct consequence of the export restrictions (similar to what happened with wheat). And on the other, there was a significant growth in exports of poultry meat, which jumped from less than 20 tons in 2001 to over 350 tons in 2013 (an increase of 1,750 percent for the period as a whole).

¹⁶ Resolution No.7/2010 and modifications, of the Secretariat of Energy (*Official Gazette*).

Figure 3.8: Evolution of Argentine exports of meats, 2001–2014, metric tons

Source: Authors, based on data from UN Comtrade.

Nevertheless, similar to what happened with soybeans, beef still represented about 65 percent of the amount of foreign sales of meat, double the amount contributed by poultry meat (US\$1.1 billion versus US\$546 million, respectively).

4. METHODOLOGY¹⁷

Dataset

There is no comprehensive dataset of export taxes applied worldwide. The Global Trade Analysis Project (GTAP 9.1) dataset (base year 2011) has limited export tax coverage: only 21 sectors out of 42 (trade in merchandise) have observations with export taxes and, on average, 17 percent of the exporters of these sectors use export taxes.

The export tax data in the GTAP 9.1 dataset has several flaws. First, it is not based on data collection at the Harmonized System (HS) level; instead, its data result from the processing of macrodata from social accounting matrixes. These data can be outdated and may mix the export taxes and other price distortions into both domestic and export prices. In some cases, the data are defined at a higher level of aggregation and are then spread out over several sectors during the GTAP database formatting process. Second, the GTAP treatment of agricultural products leads only to a net distortion at the border: net export taxes from export subsidies. Since agricultural negotiations have not focused on export restrictions, the GTAP database has discarded the information on export taxes for agricultural products. Third, it is obvious that some important countries, such as China, are missing from the list of export restriction users. Fourth, because the GTAP database has a specific module that addresses the energy sectors (gas, oil, petroleum, and coal, either processed or refined), there is a

¹⁷ This section is based on Laborde, Estrades, and Bouët (2013).

higher concentration of export taxes in the energy sector due to the different treatment of, and the additional information available for, that sector.

To overcome these limitations, we have developed a new database defined at the exporter/HS6 level, with information on ad valorem and specific export taxes. This dataset is then aggregated into the GTAP database sectors; we rebalance the GTAP database before using those values in the model.

The overall approach closely resembles the methodology used in the MacMapHS6 import duties dataset and its linkage with the GTAP database (see Boumellassa, Laborde, and Mitaritonna 2009).

The most important technical choices for building the database are the following:

- Due to poor information and implementation challenges, we do not consider bilateral export taxes (no preferential treatment).
- We try to use the most recent information, particularly the data on export taxes provided by the Directorate General for Trade of the European Union Commission, but we supplement this with alternative sources, such as trade policy reviews by the WTO, the Organization for Economic Cooperation and Development (OECD), DG Trade - EU trade briefs, and publisher resources (Piermartini 2004; Bouët and Laborde 2010a). However, current but short-term measures are discarded.
- We use the MacMapHS6 trade weights to aggregate export taxes from the HS6 level to the GTAP sectors. However, we take into consideration the fact that the FOB value includes the export taxes, and we compute pre-export tax weights before aggregating.
- For energy sectors, we keep the existing GTAP9.1 export taxes information when available.¹⁸

These changes do not greatly modify the average global level of export taxes. However, they do lead to strong sectoral and country reallocation. For example, China now applies export taxes, Argentina jumps from an average 0.3 percent export tax to more than 9 percent, and export taxes globally disappear from the apparel sector and concentrate instead on raw agricultural products (raw hides, oilseeds, cotton, and cocoa), minerals, processed oilseeds (soybean oil and palm oil), aluminum and iron (scrap and semi-processed), and timber (rough and logs). The bulk of export taxes are still imposed on energy products, and the export tax applied by Russia on natural gas (according to GTAP data) is the main source of global distortion.

¹⁸ We should keep in mind that in the GTAP database, the export tax on an energy product, such as natural gas, is equal to the price distortion between domestic prices and export prices. This difference can be the result of different policies, such as explicit tax, export constraint/restriction, or strategic behavior.

Table 4.1 shows the export tariffs used for Argentina in the model for the base year.

Table 4.1: Argentina export tariffs used in the model (base year)

Sector	Export tax
Beverages and tobacco	15%
Chemicals	15%
Gas	23%
Gas, processed	23%
Cereals	25%
Leather	15%
Animal products	15%
Oilseeds	35%
Petroleum	23%
Vegetable oil	32%

Source: Authors' computation.

5. THE MIRAGRODEP GLOBAL COMPUTABLE GENERAL EQUILIBRIUM MODEL

This section summarizes the features of the Miragrodep version used in this study and the key assumptions relevant for this paper. It is important to note the code modification introduced in the model to capture the quantitative export restrictions (See Appendix 3 for detailed explanation).

General features

Miragrodep is a multisectoral, multiregional CGE model devoted to trade policy analysis.¹⁹ The model operates in a sequential dynamic recursive setup (that is, it is solved for one period, and then all variable values, determined at the end of a period, are used as the initial values of the next period). Macroeconomic data and social accounting matrixes, in particular, come from the GTAP9.1 database, which describes the world economy in 2012 (Aguilar, Narayanan, and MacDougall 2016). From the supply side in each sector, the production function is a Leontief function of value-added and intermediate inputs: for production, one output unit needs x percent of an aggregate of productive factors (labor, unskilled and skilled; capital; land and natural resources) and $(1 - x)$ percent of intermediate inputs. The intermediate inputs function is an aggregate constant elasticity of substitution (CES) function of all goods, which means that substitutability exists between two intermediate goods, depending on the relative prices of these goods. This substitutability is constant and at the same level for any pair of intermediate goods. Similarly, in the generic version of the model, value-added is a CES function of unskilled labor, land, natural resources, and a bundle of skilled labor and capital. This nesting allows the modeler to introduce less substitutability between capital and skilled labor than between these two and other factors. In other words, when the relative price of unskilled labor is increased, this

¹⁹ For more information on Miragrodep, see www.agrodep.org/model/miragrodep-model.

factor is replaced by a combination of capital and skilled labor, which are more complementary.²⁰

Factor endowments are fully employed. The only factor with constant supply is natural resources, with a few exceptions detailed later in this paper. Capital supply is modified each period because of depreciation and investment. Growth rates of labor supply evolve exogenously based on UN demographic projections. Land supply is endogenous, as it depends on the real remuneration of land. In some countries, land is a scarce factor (for example, India, Europe²⁸), such that elasticity of supply is low. In others, land is abundant (Brazil and the North American Free Trade Agreement, or NAFTA, countries), and elasticity is high.²¹

Skilled labor is the only factor that is perfectly mobile. Installed capital and natural resources are sector specific. New capital is allocated among sectors according to an investment function. Unskilled labor is imperfectly mobile between agricultural and nonagricultural sectors, according to a constant elasticity of transformation (CET) function, because unskilled labor's remuneration in agricultural activities is different from that in nonagricultural activities. This factor is allocated between these two series of sectors according to the ratio of remunerations. Land is also imperfectly mobile between agricultural sectors.

The Miragrodep model uses constant aggregate employment (wage flexibility) in all countries. It is quite possible to suppose that total aggregate employment is variable and that there is unemployment; however, this choice greatly increases the complexity of the model, which means simplifying assumptions have to be made in other areas (such as in the number of countries or sectors). This assumption could amplify the benefits of trade liberalization for developing countries. In full-employment models, increased demand for labor (from increased activity and exports) leads to higher real wages, such that the origin of comparative advantage is progressively eroded; however, in models with unemployment, real wages are constant, and exports can increase much more.

Capital in a given region, whatever its origin (domestic or foreign), is assumed to be obtained by assembling intermediate inputs according to a specific combination. The capital good is the same whatever the sector. In this version of Miragrodep, we assume that all sectors operate under perfect competition, there are no fixed costs, and price equals marginal cost.

The demand side is modeled in each region through a representative agent whose propensity to save is constant. The rest of the national income is used to purchase final consumption.

²⁰ For all countries, substitution elasticity among unskilled labor, land, and natural resources is equal to 0.4 for the agricultural sector and 1.1 for the rest of the sectors. The elasticity between the bundle of capital and skilled labor is 0.6 for all sectors and countries.

²¹ In the case of Argentina, we use the same elasticity used for the scarce-land countries, given that using that elasticity gives us the arable land growth observed between the 2011/2012 campaign and 2014, contained in FAO (2017).

Preferences between sectors are represented by a linear expenditure system–constant elasticity of substitution function. This implies that consumption has a nonunitary income elasticity (that is, when the consumer’s income is augmented by x percent, the consumption of each good is not systematically raised by x percent, other things being equal). The sector subutility function used in Miragrodep is a nesting of four CES-Armington functions that defines the origin of the goods. In this study, Armington elasticities are drawn from the GTAP9.1 database and are assumed to be the same across regions.

Macroeconomic closure is obtained by assuming that the sum of the external balance of goods and services plus foreign direct investment is constant. It implies an adjustment of the real exchange rate to keep this balance constant. Moreover, a lump-sum tax is applied in each country in order to keep public revenues constant (when export taxes are removed).²²

Compared with the usual Miragrodep structure, we add a new policy instrument to capture quantitative export restrictions in the sectors where they apply in the case of Argentina. An ad valorem–equivalent export tax is introduced in the model and determined endogenously to maintain the volume of exports consistent with the policy in the baseline (this instrument applies to the wheat sector only). In the scenario, we remove this tax at the same time as the other restrictions (see Appendix 3 for a detailed explanation).

Key assumptions

This section addresses other methodological points concerning the focus of this paper. First, as mentioned, we consider export taxes to be exogenous policy instruments: they are not determined by optimal behavior from policy makers and do not respond to foreign policies and changes in world prices. This implies that export taxes do not change in the baseline; thus, we remove them exogenously in the policy scenarios.

Second, the level of Armington elasticities plays an important role. These elasticities define the market power of a specific exporter since they indicate how captive the importer is vis-à-vis a specific supplier. When implementing the export tax elimination scenario, a large elasticity will boost the tax removal’s trade creation effects (that is, combining a large Armington elasticity with large export taxes initially can lead to very strong effects). In our scenario, we use the standard GTAP Armington values, which are low, and we perform a sensitivity analysis on this parameter using the values from the World Bank’s LINKAGE CGE model (van der Mensbrugghe 2005), which are higher and equal to double the standard GTAP elasticities.

Third, factors of production have a constant supply, leaving wages and rents endogenous to the model. Finally, government deficits are allowed to change, not kept fixed as the percentages of GDP²³ and of foreign savings are fixed.

²² The government closure will be changed in some of the simulations.

²³ Some simulations in this paper will have a different government closure, to illustrate different policy alternatives for the government.

6. SCENARIOS

We are interested in looking at the effects of an elimination of export tariffs and export restrictions for agricultural products in Argentina. The scenario used replicates the part of the export tariffs established by Decree No. 133/2015 and Decree No. 160/2015 of December 2015 that apply to the agricultural sector (*Official Gazette*). In these decrees, export duties were removed for all agricultural tariff items, except for soybeans and their derivatives, which were reduced to 30 percent and 27 percent, respectively. As mentioned before, the export taxes in the soybean complex were not fully eliminated. In 2015, a yearly reduction of 5 percentage points until 2021 was announced. However, in October 2016, the government announced that there was not going to be a reduction in the tariff for 2017 in the oilseed complex, and in January 2017 it announced a monthly 0.5 percentage point decrease from January 2018 until December 2019, to reach the goal of an 18 percent tax rate for soybeans and 15 percent tax rate for oils in December 2019.²⁴

The Argentine government also eliminated export restrictions, which strongly affected the exports of wheat, maize, bovine meat, and some dairy products. Grain restrictions (under the so-called green ROE) were modified by Resolutions No. 4/15 and No. 7/15, while dairy restrictions (white ROE) were amended by Resolutions No. 69/16, No. 84/16, and No. 101/16 (*Official Gazette*). On the other hand, the requirements for the export of meat (red ROE) remain the same as in the previous regulations (Resolutions No. 3433/08 and No. 6687/09, *Official Gazette*), but the procedures for granting the export permits have been streamlined and made more transparent, implying a virtual elimination of the restrictions.

This paper presents three scenarios that illustrate the changes in policies (export taxes and export restrictions) under different circumstances. For our first scenario (central) we assumed that the government will keep decreasing the export tax rate at the same rate until 2021, leaving a 6 percent tax rate for soybeans and a 3 percent tax rate for oils from that year until the end of the period under consideration. The second scenario shows the important role that the government deficit plays in the way the economy adjusts to the resources it has, and the third scenario illustrates the effect that the export tax differential on the soybean complex has on the value chain and the rest of the economy.

The results are presented as a comparison between the baseline, without policy changes, and the scenarios, with changes in policies. In the baseline, capital accumulates according to investments, labor supply follows demographic projections, and total factor productivity is calibrated to reproduce the World Bank GDP projection up to 2025.

7. RESULTS

It is important to note that our scenario illustrates the effect of the elimination, or in some commodities, the reduction, of export taxes and export restrictions only in Argentina. Given the size of the Argentine economy, it is not surprising that the impact on the rest of the

²⁴ Decree No. 1343/2016 of January 2017 (*Official Gazette*). This scenario was also run, but the results are not showed in this paper given that they are very similar to the central scenario described in the paper, in which the export tax is reduced for two more years.

world is very small;²⁵ however, there are some changes in the international prices of some commodities of which Argentina is a large exporter.

The decrease in world prices of soybeans and grains will negatively affect countries that produce those commodities (Brazil and NAFTA countries) and benefit the countries that import them. Overall, world consumption of soybeans and wheat increases by 0.3 percent with respect to the base in 2025 and by 0.04 percent for the case of other cereal grains (Table 7.1). Interestingly, the price of vegetable oils decreases more than the price of oilseeds since this market is impacted by the removal of export taxes on the both outputs (oil) and the inputs (soybeans). While Argentina is not a major dairy exporter, the dairy sector sees a decline in world prices due to lower feed costs for the industry.

Table 7.1: World prices (percentage changes in 2025 with respect to the baseline)

Paddy rice	-0.02	White meat	-0.06
Wheat	-0.47	Vegetable oils	-1.09
Cereal grains	-2.17	Dairy products	-0.33
Vegetables and fruits	0.00	Processed rice	-0.02
Oilseeds	-0.63	Sugar	-0.04
Plant-based fibers	-0.04	Food products	0.01
Other crops	-0.06	Beverages and tobacco	-0.02
Cattle	-0.14	Leather products	-0.15
Other animals	-0.02	Agrifood	-0.28
Fisheries	-0.03	Industry	-0.02
Red meat	-0.02	Services	0.00

Source: Authors.

Macro variables

The change in trade policies implemented by Argentina will be seen in the effects on the trade balance. The value of total exports in real terms grows by about 6.51 percent with respect to the baseline in 2025 (Table 7.2). The aggregate performance is explained by the increase in agricultural exports, which grow by 21.7 percent over the base in the first 10 years after the elimination of the tax and export restrictions, while industrial exports decrease by 5.8 percent and services decline by 7.8 percent (Table 7.3). Indeed, since we assume a fixed current account in value, the growth of agricultural exports leads to a real exchange rate appreciation and a higher domestic absorption of goods and services from secondary and tertiary activities.

²⁵ The world welfare will increase by 0.01 in this scenario.

Table 7.2: Macro results (percentage changes with respect to the baseline in 2025)

Variable	Central scenario
GDP	0.13
Welfare	0.72
Imports	5.06
Exports	6.51
Terms of trade	-1.33
Investment	-2.03
Government revenue	-4.47
Government savings	-7.79

Source: Authors.

Note: GDP, imports, exports, investment, government revenues, and government savings are in constant Argentine pesos. Welfare is calculated as equivalent variation, which can be interpreted as real consumption.

Argentina has market power in some agricultural commodities, which implies that the terms of trade tend to move against the country: the changes in export tax and export restrictions push international prices down. In our scenario, the terms of trade for Argentina decrease by 1.3 percent with respect to the baseline by 2025.

The Argentine economy will grow by 0.13 percent more than in the case of not eliminating the export taxes by 2025, driven by growth in the agricultural sector due to the change in export policies toward the sector (see Table 7.2). The moderate GDP increase is related to the assumptions regarding factor employment. We assume constant employment of labor and capital, and therefore real GDP growth is driven only by efficiency gains and real exchange rate effects.

Another noticeable result is that when export taxes decrease, causing a small expansion in GDP, it is not related to an increase in the aggregate level of investments, even if investments in agriculture go up. The reason is that in this scenario the government deficit worsens due to the drop in revenues caused by the reduction in export taxes. In turn, this leads to a crowding-out effect on private investments due to the now bigger government deficit (a decline of government savings of almost 7.8 percent of the GDP by 2025 compared with the baseline) (see Table 7.2).

Table 7.3: Value of exports (percentage changes with respect to the baseline, 2025)

Paddy rice	-40.83	White meat	5.35
Wheat	41.83	Vegetable oils	37.14
Cereal grains	25.17	Dairy products	87.99
Vegetables and fruits	-18.54	Processed rice	-16.12
Oilseeds	9.09	Sugar	-25.07
Plant-based fibers	-21.51	Food products	-18.05
Other crops	-30.46	Beverages and tobacco	-2.74
Cattle	-45.15	Leather products	81.71
Other animals	-19.36	Agri-food	21.68
Fisheries	-1.08	Industry	-5.81
Red meat	156.82	Services	-7.78

Source: Authors.

In fact, total investment will be 2.1 percent less than at the baseline at the end of the period in the case of elimination of export taxes (the only reduction is in the case of the oilseed value chain). However, the sectors for which the export restrictions are eliminated experience an increase of investment of between 7 percent and 30 percent with respect to the baseline in 2025. For the rest of the agricultural sector, the level of investment will be smaller when export taxes are eliminated, showing the same crowding-out effects of the now bigger government deficit.

Change in domestic prices—changes in income (welfare and household income)

The consumer price index increases by about 3.8 percent with respect to the reference in 2025. Looking at producer prices, those in the agri-food sector increase by 18.2 percent, in industry by 2.3 percent, and in services 2.8 percent (each by the end of the period analyzed when compared with the baseline). Prices play an important role as a mechanism of adjustment for this economy after the elimination of the export taxes and restrictions. Domestic prices in Argentina increase more rapidly than in the rest of the world, leading to a real appreciation of the exchange rate, as discussed above.

Overall welfare also increases by a small 0.7 percent with respect to the baseline at the end of the period analyzed. It is important to note that this result applies to all Argentine households as a whole (it is the sum of all households in the economy); obviously, this does not mean that all of them may benefit from the change in policy.

Production by sector (production and employment)

Table 7.4 reports the changes in 2025 observed in production when comparing the trajectory of keeping the export taxes and restrictions versus eliminating them. We can see that the commodities in which the export taxes are eliminated or reduced increase their production at the expense of the commodities that did not have export taxes originally.

Table 7.4: Production volume (percentage changes with respect to the baseline, 2025)

Paddy rice	-16.79	Red meat	10.91
Wheat	16.07	White meat	-9.96
Cereal grains	13.34	Vegetable oils	31.03
Vegetables and fruits	-11.47	Dairy products	8.61
Oilseeds	20.60	Processed rice	-10.74
Plant-based fibers	-13.01	Sugar	-7.46
Other crops	-17.08	Food products	-8.28
Cattle	3.64	Beverages and tobacco	-0.66
Other animals	-16.13	Leather products	25.79
Fisheries	-3.03		

Source: Authors.

Those are results at the end of the period analyzed. But there are also adjustments over the years to the policy changes implemented that are worth mentioning.

Cereals see a big increase in production (around 20 percent for the first few years) after the export tariffs and restrictions are eliminated; however, in the years that follow, the level of production increases at a rate comparable to the one obtained when restrictions are still in place, showing the effect of the ROE on wheat production. In the case of soybeans, the increase in production takes place at a steadier growth after 2017, given that the export tax is not eliminated completely in the first year but instead had an initial 5 percentage point decrease in 2016 and no reduction at all in 2017, followed by a 0.5 percentage point reduction every month from January 2018 to December 2021.

Vegetable oils show the same pattern as oilseeds, but with a somewhat higher annual growth, in the order of 8 percent for the first years and then only around 1 percent for the last four years of the period analyzed.

We should note that soy meal as well as milled flour are combined into the food processing sector, not allowing a detailed analysis of the effects of the policy changes in these sectors.

The livestock sector in Argentina has experienced many challenges. The number of bovines slaughtered and the extraction rate (slaughter of beef cattle stock) in the country over the last three decades fluctuated between 29 percent and 22 percent, being the highest in 2009 and the lowest in 2016. The elimination of export restrictions, aided by the initial lower rate of extraction, will lead to an increase in the production of meat and leather in the upcoming years, as shown in Table 7.4. On the other hand, non-beef production of meat declines, affected by the higher price of feed products.

The favorable situation for the agricultural sector can be seen in that employment in the agricultural sector increases by 6 percent while employment in the nonagricultural sector declines by 1.1 percent with respect to the baseline, at constant total employment. Overall, the real wage for unskilled workers (deflated by the consumer price index) increases by 1

percent. Also, the amount of land dedicated to oilseeds, wheat, and other cereals increases by 9.9 percent, 7.1 percent, and 5.4 percent, respectively, over the 10 years analyzed, to the detriment of the other agricultural commodities.

Fiscal accounts

As noted, the government deficit increases in the first years given the decrease in tax revenues. This is reflected in a decline in investment spending. The transmission mechanism for this crowding out in a macroeconomic model with financial variables would include channels such as government borrowing that drives up interest rates, decreasing investments. In this CGE model, without financial variables, there is a direct negative effect from reduced savings to investments through changes in the available net savings for the private sector.

Government revenues are 4.5 percent smaller than in the case where export taxes are not eliminated in 2025, while the ratio of government revenue over GDP decreases by 4 percent with respect to the baseline by 2025. However, although there is a considerable decrease in revenues in the first six years, after that the revenues in this scenario grow at a slightly higher rate than the baseline, due to the expansion of the tax base related to higher economic growth, but never reaching the previous levels as a percentage of the GDP (10 years is not enough for government revenues to catch up with the level they would have reached in the case where taxes were not eliminated). Government savings follow a similar path. With the elimination of export taxes, not only government revenues but also government savings are smaller than in the case with export taxes, since we do not consider an alternative tax strategy and we do not reduce public expenditures.

So far, the discussion has considered a government closure in which deficits can increase and the government relies only on domestic savings. In what follows, other closures are considered for the government accounts.

Other closures for the government accounts

In this section, we assume that the public budget balance is a constant proportion of GDP and that an increase in the consumption tax rate is implemented to offset the loss revenue caused by the reduction of export taxes. In this scenario, the alternative public closure is also applied in the baseline, leading to different baseline levels in each of the scenarios.

Table 7.5 shows the results from the scenario in which export taxes and restrictions are eliminated for almost all of the agricultural sector (with the exception of the oilseed value chain, in which the export tax is reduced but not totally eliminated by 2021), using different government closures.

Table 7.5: Macro results with different government closures (percentage changes with respect to the baseline, 2025)

Variable	Consumption tax adjustment	Central scenario
GDP	1.44	0.13
Welfare	0.16	0.72
Imports	6.35	5.06
Exports	6.39	6.51
Terms of trade	-1.57	-1.33
Investment	1.08	-2.03
Government revenue	0.03	-4.47
Government savings	0.06	-7.79

Source: Authors.

Note: GDP = gross domestic product. The central simulation has flexible government savings as a percentage of GDP. GDP, imports, exports, investment, government revenues, and government savings are in constant Argentine pesos. Welfare is calculated as equivalent variation, which can be interpreted as real consumption.

The first thing to notice is that when government savings as percentage of GDP is kept at the same level as in the baseline, there is no crowding out of investment (it is 1.1 percent higher than the baseline in 2025) and GDP is 1.4 percent above that baseline as well (Table 7.5).

As can be seen in the results, there are implications for allowing an increase in the government deficit. If the deficit increases in response to the decrease in government revenues, there will be less domestic savings in the economy; this is translated into lower total investment and lower GDP growth. However, consumers, as a whole, will still benefit from the somewhat higher levels of consumption they can now achieve. In the case of the second scenario—government deficit stays constant as a percentage of GDP—there is no crowding out of investment. There is higher GDP growth, but household consumption (and therefore welfare) will be smaller, given the increase in the consumption tax rate necessary to compensate for government revenue losses from export tax elimination.

Tax differential in the oilseed value chain

The situation in the oilseed value chain does still reflect the fact that, as mentioned in the previous sections of this paper, the export tax has not been totally eliminated. The most recent decree covers only the period until 2019, not being clear on what will be the next steps.

We run one additional scenario that relates exclusively to the oilseed value chain. The idea is to illustrate the differences that would result from totally eliminating the export tax, which obviously also implies the elimination of the export tax differential. The simulation allows changes in the government's fiscal deficit.

In this scenario, the production of soybeans and oils grows by 4.7 and 2.5 percentage points, respectively, compared with the case in which the export taxes on those products are not totally eliminated and therefore the export differential remains. The results are in line with

similar findings obtained in a partial equilibrium framework by Bouët, Estrades, and Laborde (2014), showing that the elimination of the export tax differential will not necessarily lead to declines in the processed product.²⁶ The impact on the rest of the economy will be different as well. Table 7.6 shows the macro results for the two scenarios for the oilseed value chain under the same closure (that is, allowing fiscal deficits to increase).

Table 7.6: Macro results of scenarios for the oilseed value chain (percentage changes with respect to the baseline, 2025)

Variable	Central scenario	Total elimination
GDP	0.13	0.09
Welfare	0.72	0.87
Imports	5.06	5.26
Exports	6.51	6.79
Terms of trade	-1.33	-1.40
Investment	-2.03	-2.57
Government revenue	-4.47	-5.07
Government savings	-7.79	-9.32

Source: Authors.

Note: GDP = gross domestic product. GDP, imports, exports, investment, government revenues, and government savings are in constant Argentine pesos. Welfare is calculated as equivalent variation, which can be interpreted as real consumption.

The total welfare of Argentina is 0.15 percentage points higher by 2025 in the case of total elimination of the export taxes, compared with the scenario described in the first section of this paper, in which export taxes in the oilseed value chain are not totally eliminated.

GDP will grow by 0.04 percentage points less in the case of the total elimination of the tax, compared with the scenario in which the 6 percent and 3 percent export tax rates are retained for oilseed and vegetable oil, respectively.

Government savings will be 1.5 percentage points lower in the case of the total elimination of export taxes for the oilseed value chain, and government revenues will be 0.6 percentage points less in this case. All this suggests that the main impact of eliminating all export taxes is on the government accounts. All this suggests that the main impact of eliminating all export taxes falls on the government accounts.

²⁶ This result can be rationalized as the combination of several effects: on the one hand, the differential gives some price advantage to the processors by reducing the cost of raw material, but it reduces the amount of primary production available to be processed; eliminating the differential leads to more primary production and that spills over into more processing activity. In the first case the processors would have a larger profit margin but over a smaller quantity; in the second, the crushing/processing sector would have a lower profit margin but over a larger quantity. Given the fixed costs in the industry that need to be covered, the expansion of production even at lower margins may lead to better overall economic results for the processing sector.

8. CONCLUSIONS

This paper has provided an economic analysis of the elimination of export taxes and export restrictions in the Argentine agricultural sector.

Several arguments have been used to justify the implementation of such trade practices: (1) export taxes can raise the world price of exports and therefore improve terms of trade; (2) export taxes can reduce the domestic price of the taxed commodity and benefit final consumers of this commodity; (3) export taxes can reduce the domestic price of the taxed commodity and benefit intermediate consumption of this commodity (important when the commodity is a primary one and expansion of the manufacturing sector that buys it is at stake, as with the soybean value chain); (4) export taxes increase public revenue, which is beneficial in a country where fiscal receipts on the domestic base are small, provided that the tax does not reduce total production of the taxed good; and (5) export taxes are a means of redistributing income from domestic producers of the good taxed to domestic consumers of that good, and to the public sector. We considered several of them in this paper.

First, we found that export taxes and restrictions in Argentina do affect world prices and the country's terms of trade. The removal of those taxes and restrictions leads to declines in world prices, particularly of those products whose supply was most affected in that country by the lower domestic prices for producers generated by the policy interventions. These declines negatively affect producers of similar products in other countries but benefit consumers. However, the overall change for world welfare, although positive, is basically negligible in value, given that the size of Argentina in the global economy is small.

Second, the removal of export taxes and restrictions leads to small increases in GDP in Argentina compared with the baseline maintaining them. Those policy changes also generate small increases in overall welfare. What changes most is the structure of production, rather than the overall level of GDP or welfare. In fact, the agricultural and agro-industrial sectors whose supply was affected by the restrictions increase significantly (wheat and other cereals, the oilseeds complex, red meat production), but others contract, affected by competition for land and/or increases in the costs of raw materials (such as animal feed in the case of the production of white meat). Outside the agricultural sector, industry (other than agro-industries) and services decline compared with the baseline with taxes and restrictions, due to the real appreciation of the Argentine peso and our assumption of constant employment. Investment declines overall when the deficit is allowed to increase with the removal of export taxes, but again, there are important differences across sectors, with investment increasing in the sectors benefiting from the policy changes and declining in other sectors. It would be important to further analyze these issues in the context of less than full employment of factors.

Third, an important consideration is that the reduction in export taxes increases the government's deficit; therefore, other taxes or adjustments in fiscal accounts will be needed to keep fiscal balances and to deal with the possible negative crowding-out effect on

investment. In fact, in the simulation that increases consumption taxes to compensate for the decline in export taxes, investment increases (that is, there is no crowding-out effect). Other options to maintain the level of investment in the first years would be foreign borrowing by the government or expansion of foreign direct investment; but of course, these options would require increases in external payments in the future.

Fourth, contrary to the idea that the elimination of the export tax differential in the oilseeds value chain would lead to a decline in the production of the processed products (such as soybean oil), the simulations show that the impact of the expansion of the primary product (when the elimination of the differential is combined with an overall reduction of export taxes) also leads to an increase in the production of the processed products.

Besides the economic aspects discussed so far, it is important to remember the legal issues involved. Article XI of the General Agreement on Tariffs and Trade 1994, among other things, prohibits the application of quantitative restrictions to exports, but includes an exception related to “export prohibitions or restrictions temporarily applied to prevent or relieve critical shortages of foodstuffs or other products essential to the exporting contracting party.” The applicability of this exception hinges on the interpretation of several undefined terms such *temporarily*, *critical shortages*, and *essential* products. On the other hand, export taxes are allowed under the WTO.

Export taxes and export restrictions will be part of the discussions at the WTO. Net food exporting countries should be prepared to discuss with net food importers the possibility of a compromise on the use of export taxes, perhaps combined with some expansions in market access.

This paper has tried to contribute to that debate, looking in some detail at the experience of Argentina.

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APPENDIX 1: Agricultural export duties in Argentina, 2015

HS	Description	Export Duty (%)
0201.10.00	Carcases or half-carcases of bovine animals, fresh or chilled	15.00
0202.10.00	Frozen bovine carcasses and half-carcasses	15.00
0203.11.00	Swine carcasses and half carcasses, fresh or chilled	5.00
0206.10.00	Fresh or chilled edible offal of bovine animals	5.00
0207.11.00	Fresh or chilled fowls of the species <i>Gallus domesticus</i> , not cut in pieces	5.00
0207.14.00	Frozen cuts and edible offal of fowls of the species <i>Gallus domesticus</i>	5.00
0302.11.00	Trout, fresh or chilled excluding heading No 03.04, livers and roes	10.00
0302.43.00	Fresh or chilled sardines " <i>Sardina pilchardus</i> , <i>Sardinops</i> spp.", sardinella " <i>Sardinella</i> spp.", brisling or sprats " <i>Sprattus sprattus</i> "	10.00
0302.54.00	"Fresh or chilled hake " <i>Merluccius</i> spp., <i>Urophycis</i> spp.""	10.00
0304*	Fish fillets and other fish meat, fresh, chilled or frozen.	5.00
0401*	Milk and cream, not concentrated, not containing added sugar.	0.00
0403*	Buttermilk, curdled milk and cream, yogurt, kefir and other milk and cream, fermented or acidified.	0.00
0405*	Butter and other fats derived from milk; dairy spreads.	0.00
0406*	Cheese	0.00
0407*	Eggs, fresh, preserved or cooked.	5.00
06*	Live plants and floricultural products.	10.00
0701*	Potatoes	2.50
0703*	Onions, shallots, garlic, leeks and other alliaceous vegetables	2.50
0709*	Other vegetables, fresh or chilled.	2.50
0805.10.00	Oranges	2.50
0805.50.00	Lemons	2.50
0806.10.00	Grapes	5.00
0808*	Apples, pears and quinces	5.00
0902*	Tea	5.00
1001.19.00	Wheat	23.00
1003.90*	Barley	20.00
1005.90.10	Corn in grain (1)	20.00
1101.00.10	Wheat flour	13.00
1107*	Malt	10.00
1201.90.00	Soybeans	35.00
1206.00.90	Sunflower seed (2)	32.00
1507*	Soybean oil	32.00
1512.11.10	Sunflower oil	30.00
1515.21.00	Corn oil	15.00
1602*	Other prepared or preserved meat, meat offal or blood. (3)	5.00
1604*	Prepared or preserved fish; caviar and caviar substitutes.	5.00
1605*	Crustaceans, molluscs and other aquatic invertebrates prepared or preserved.	5.00
1701*	Cane or beet sugar and sucrose.	5.00
1704*	Sugar confectionery not containing cocoa.	5.00
1902*	Pasta, including cooked or stuffed.	5.00
1904*	Cereal products obtained by swelling or roasting; Cereal grains or as flakes or other worked grains.	5.00
1905*	Bakers' wares.	5.00
20*	Preparations of vegetables and fruits	5.00
22*	Beverages, spirits and vinegar.	5.00
2304.00.10	Flour and "pellets" of soy	32.00
2304.00.90	Soybean cakes and expellers	32.00
2306.30.10	Cakes, flour and "pellets" of sunflower	30.00
2309*	Preparations of a kind used for animal food.(4)	5.00
25*	Mineral products. (5)	10.00
26*	Iron ores and concentrates, including roasted iron pyrites. (6)	10.00
2709.00	Crude oil	1.00
2711.11.00	Liquefied petroleum gas	100.00
2711.21.00	Gaseous natural petroleum gas	100.00
28*	Inorganic chemicals	5.00
3826.00.00	Biodiesel	32.00
4101.20.00	Hides and skins, undivided, unitary lower or equal to 8 kg dry weight, 10 kg when dry-salted, or 16 kg when fresh, salted (wet) or otherwise preserved (7)	15.00
4107*	Cattle hides prepared, without hair.	5.00
4114*	Chamois leather; varnished leather hides and skins and their imitations.	5.00

Source: Authors, based on Tarifar (2015).

Note: HS = Harmonized System code(s).

* Includes all positions to eight-digit HS.

(1) Except popcorn, taxed at 5 percent.

(2) Except shelling sunflower (5 percent) or confectionery type (10 percent).

(3) Except 1602.50 (of cattle), taxed at 15 percent.

(4) Except those containing soy in their constitution, taxed at 32 percent.

(5) Except 2522 (lime), taxed at 5 percent.

(6) Except slag, taxed at 5 percent.

(7) Except dried, without traces of treatment salts, taxed at 5 percent.

APPENDIX 2: Agricultural production of some of the main world agricultural exporters, 2001–2004, metric tons

Maize	Argentina		Australia		Brazil		USA		Ukraine	
	Qty.	Area (ha)	Qty.	Area (ha)	Qty.	Area (ha)	Qty.	Area (ha)	Qty.	Area (ha)
2001	15.359.397	2.815.504	345.000	74.000	41.955.264	12.330.300	241.375.035	27.829.722	3.640.700	1.122.800
2002	14.712.079	2.420.124	454.000	83.000	35.933.000	11.750.900	227.765.357	28.057.158	4.180.300	1.188.700
2003	15.044.529	2.322.857	310.000	50.000	48.327.323	12.965.678	256.227.304	28.710.327	6.875.100	1.988.800
2004	14.950.825	2.338.602	395.000	70.126	41.787.558	12.410.677	299.873.563	29.797.730	8.866.800	2.299.600
2005	20.482.572	2.783.436	419.672	72.378	35.113.312	11.549.425	282.260.662	30.399.000	7.166.600	1.659.500
2006	14.445.538	2.447.166	380.000	76.000	42.661.667	12.613.094	267.501.056	28.586.492	6.425.600	1.720.300
2007	21.755.364	2.838.072	239.879	48.852	52.112.200	13.767.400	331.175.072	35.013.779	7.421.100	1.902.800
2008	22.016.926	3.412.155	387.000	68.000	58.933.347	14.444.582	307.142.010	31.796.493	11.446.800	2.440.100
2009	13.121.380	2.353.175	375.670	64.580	50.719.822	13.654.715	332.548.610	32.168.810	10.486.300	2.089.100
2010	22.663.095	2.904.035	328.000	59.000	55.364.271	12.678.875	316.164.930	32.960.380	11.953.000	2.647.600
2011	23.799.830	3.747.838	356.943	62.196	55.660.235	13.218.892	313.934.773	33.989.172	22.837.900	3.543.700
2012	21.196.637	3.696.300	450.535	69.684	71.072.810	14.198.496	273.820.066	35.359.439	20.961.300	4.371.900
2013	32.119.211	4.863.801	506.725	78.634	80.273.172	15.279.652	351.271.870	35.390.550	30.949.550	4.826.900
2014	33.087.165	4.836.655	390.364	52.360	79.881.614	15.432.909	361.091.140	33.644.310	28.496.810	4.626.900
Annual Growth 2007-14*	3,0%	3,9%	3,5%	0,5%	3,1%	0,8%	0,6%	-0,3%	10,1%	6,6%
Annual Growth 2001-14*	5,6%	3,9%	0,9%	-2,4%	4,7%	1,6%	2,9%	1,4%	15,8%	10,6%
Soybeans	Argentina		Australia		Brazil		USA		Ukraine	
	Qty.	Area (ha)	Qty.	Area (ha)	Qty.	Area (ha)	Qty.	Area (ha)	Qty.	Area (ha)
2001	26.880.852	10.400.193	49.000	33.000	39.058.000	13.974.300	78.669.912	1.350.000	73.900	29.532.250
2002	30.000.000	11.405.247	63.000	32.000	42.769.000	16.365.400	75.008.544	1.445.360	124.700	29.338.812
2003	34.818.552	12.419.995	9.212	6.241	51.919.440	18.524.768	66.781.392	1.474.148	231.800	29.330.310
2004	31.576.752	14.304.539	59.807	27.018	49.549.940	21.538.990	85.013.944	1.870.000	363.310	29.930.060
2005	38.289.744	14.032.198	54.000	26.585	51.182.072	22.948.874	83.504.928	1.970.000	612.600	28.834.570
2006	40.537.364	15.130.038	55.000	23.889	52.464.640	22.047.348	86.998.896	2.200.000	889.600	30.190.680
2007	47.482.784	15.981.264	32.000	13.131	57.857.200	20.565.300	72.857.736	2.400.000	722.600	25.959.244
2008	46.238.088	16.387.438	34.700	14.900	59.833.104	21.246.302	80.748.704	2.463.510	812.800	30.222.654
2009	30.993.380	16.771.003	80.100	42.326	57.345.382	21.750.468	91.417.296	2.570.000	1.043.500	30.906.980
2010	52.675.464	18.130.800	59.600	31.300	68.756.343	23.327.296	90.605.456	2.671.059	1.680.200	31.003.300
2011	48.888.536	18.764.850	29.750	17.361	74.815.447	23.968.663	84.191.928	2.805.467	2.264.400	29.856.410
2012	40.100.196	17.577.320	86.100	38.100	65.848.857	24.975.258	82.790.870	2.920.000	2.410.200	30.814.720
2013	49.306.200	19.418.824	91.800	41.100	81.724.477	27.906.675	91.389.350	3.080.000	2.774.300	30.858.830
2014	53.397.715	19.252.552	80.000	37.000	86.760.520	30.273.763	106.877.870	3.500.000	3.881.930	33.423.750
Annual Growth 2007-14*	0,8%	1,3%	6,8%	7,7%	2,9%	2,8%	2,8%	2,7%	12,8%	1,8%
Annual Growth 2001-14*	5,0%	4,5%	3,6%	0,8%	5,9%	5,7%	2,2%	7,0%	32,7%	0,9%
Wheat	Argentina		Australia		Brazil		USA		Ukraine	
	Qty.	Area (ha)	Qty.	Area (ha)	Qty.	Area (ha)	Qty.	Area (ha)	Qty.	Area (ha)
2001	16.146.620	6.475.695	24.299.000	11.529.000	3.364.950	1.727.390	52.999.932	19.616.538	21.348.000	6.882.000
2002	15.427.820	6.887.970	10.132.000	11.170.000	3.105.660	2.104.900	43.703.968	18.544.516	20.556.000	6.749.600
2003	12.399.040	6.089.630	26.132.000	13.067.000	6.153.500	2.560.230	63.803.256	21.474.070	3.599.300	2.456.400
2004	14.710.175	5.782.072	21.905.112	13.399.397	5.818.846	2.807.224	58.697.040	20.221.956	17.520.200	5.533.700
2005	16.139.170	6.123.570	25.173.000	12.456.000	4.658.790	2.360.696	57.241.992	20.276.588	18.699.200	6.571.000
2006	12.721.976	5.028.140	10.821.628	11.797.888	2.484.848	1.560.175	49.216.040	18.939.492	13.947.300	5.511.000
2007	14.662.945	5.589.230	13.569.378	12.578.309	4.114.060	1.853.220	55.820.360	20.638.784	13.937.700	5.951.300
2008	16.486.532	5.831.684	21.420.176	13.530.196	6.027.131	2.363.893	68.016.096	22.540.828	25.885.400	7.053.600
2009	8.508.156	4.334.780	21.656.000	13.788.000	5.055.525	2.430.253	60.365.728	20.191.200	20.886.400	6.752.900
2010	9.016.373	3.325.457	22.138.000	13.507.000	6.171.250	2.181.567	60.062.408	19.270.930	16.851.300	6.284.100
2011	16.067.929	4.582.575	27.410.076	13.501.781	5.690.043	2.138.916	54.418.808	18.496.174	22.323.600	6.657.300
2012	14.683.475	4.560.213	29.905.008	13.902.140	4.418.388	1.912.711	61.677.384	19.797.644	15.762.600	5.629.700
2013	8.134.409	3.060.199	22.855.576	12.979.382	5.738.473	2.087.395	58.104.610	18.345.410	22.279.300	6.566.100
2014	9.315.049	3.492.735	25.303.037	12.613.226	6.261.895	2.834.945	55.147.120	18.771.550	24.113.970	6.010.600
Annual Growth 2007-14*	-3,2%	-3,3%	4,6%	0,0%	3,0%	3,1%	-0,1%	-0,7%	4,0%	0,1%
Annual Growth 2001-14*	-3,9%	-4,3%	0,3%	0,6%	4,5%	3,6%	0,3%	-0,3%	0,9%	-1,0%
Meat, cattle	Argentina		Australia		Brazil		USA		Ukraine	
	Qty.	Stock (head)	Qty.	Stock (head)	Qty.	Stock (head)	Qty.	Stock (head)	Qty.	Stock (head)
2001	2.461.000	48.851.400	2.119.000	27.721.000	6.823.600	176.388.720	11.982.000	97.277.000	646.000	9.423.700
2002	2.493.000	52.000.000	2.028.000	27.870.000	7.139.000	185.347.008	12.427.000	96.723.000	703.800	9.421.100
2003	2.658.000	55.875.764	2.073.000	26.664.000	7.230.000	195.551.584	12.039.000	96.100.000	722.945	9.108.400
2004	3.024.000	56.844.020	2.033.000	27.465.000	7.774.000	204.512.736	11.134.790	94.888.000	618.000	7.712.100
2005	3.130.800	57.033.528	2.161.958	28.183.000	8.592.000	207.156.704	11.196.020	95.438.000	561.800	6.902.900
2006	3.033.600	58.293.608	2.077.072	28.393.400	9.020.000	205.886.240	11.862.800	96.701.504	567.500	6.514.100
2007	3.223.700	58.722.108	2.226.292	28.036.600	9.303.000	199.752.016	11.979.370	96.573.000	546.100	6.175.400
2008	3.131.902	57.583.120	2.131.909	27.320.978	9.024.000	202.306.736	12.162.992	96.034.496	479.700	5.490.900
2009	3.378.460	54.463.872	2.123.956	27.906.764	8.935.000	205.307.954	11.891.109	94.521.000	453.500	5.079.000
2010	2.630.163	48.949.744	2.110.243	26.733.000	9.115.000	209.541.109	12.045.767	93.881.200	427.700	4.826.700
2011	2.498.954	47.972.660	2.128.285	28.506.168	9.030.000	212.815.311	11.921.102	92.682.400	399.100	4.494.400
2012	2.595.815	49.865.864	2.128.837	28.418.422	9.307.000	211.279.082	11.810.593	91.160.200	388.500	4.425.800
2013	2.821.608	50.996.397	2.317.766	29.290.768	9.675.000	211.764.292	11.719.375	90.095.200	427.800	4.645.900
2014	2.674.000	51.646.544	2.586.317	29.103.000	9.723.000	212.366.132	11.453.253	88.526.000	412.700	4.397.700
Annual Growth 2007-14*	-1,3%	-0,9%	1,1%	0,3%	0,3%	0,4%	-0,3%	-0,6%	-2,0%	-2,4%
Annual Growth 2001-14*	0,6%	0,4%	1,4%	0,3%	2,6%	1,3%	-0,3%	-0,7%	-3,1%	-5,3%

Source: Authors, based on FAO (2017).

Note: * Cumulative annual growth.

APPENDIX 3: Export restrictions in the model

For this research, the MIRAGRODEP model was modified, introducing export quantitative restrictions (EQRs) as a shadow tax (*TaxEquivalentEQR*). The initial level was calibrated to capture the unexplained price gap between Argentinean domestic prices and world prices.

For the reference scenario, the shadow tax needs to be recalibrated based on the evolution of the EQRs (indeed, if the EQRs are increased annually or remain constant, we have to adjust the shadow tax).

The *QuantitativeIndex* parameter will be used in the model to capture the existence of the EQRs (and will be set to 0 when no EQR exists) and to show the dynamic evolution of the EQRs in the baseline. *QuantitativeIndex* is initially equal to 1 where an EQR exists. And if, for instance, the EQR increases by 1 percent a year, we will have the following:

```
QuantitativeIndex("WHT", "ARG", temps, "REF") = (1 +  
0.01) ** [ord(temp) - 1];
```

When we remove the EQRs, we just eliminate this shadow tax (*TaxEquivalentEQR*).

How to model the distortions

Before introducing the shadow price, it is important to understand which are the agents affected by it as well as in which side of the national frontier it is applied, in order to capture the right welfare effects for each category of agents.

Here, we consider that the distortions still allow Argentina to sell its exports at the world price given that we are talking about homogenous commodities. This means that the first-order effect should not change the FOB price of Argentina wheat (or any other commodity with export restrictions), but it will have terms-of-trade effects. In other words, the distortion will be located inside the border.

This implies a price reduction in the domestic market, while farmers get the free on board price (adjusted by the real export taxes).

Calibration modification

Additional code was required for the calibration of the model. Using wheat as an example, a 0.39 discount compared with the undistorted export price was considered (based on the data from Regunaga and Tejeda 2015). We can add more sectors or modify the calibration process. In this process, all of the unexplained price distortions (all of the nontariff barriers) except export taxes will be allocated to the EQR.

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