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The economic and social consequences of agricultural export taxes: A CGE – analysis for Argentina

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Abstract

This paper contributes to the ongoing discussion about the domestic, economic and social consequences of taxing agricultural exports in Argentina. Nogues (2008) conducted a partial equilibrium analysis pointing out the negative consequences of export taxes for GDP, the unemployment rate and poverty. Cicowiez et al. (2009) used a CGE-model for the Argentinean economy, choosing 2005 as the base year, and showed that the elimination of export taxes on agricultural products had negative effects on GDP, unemployment and poverty. They argued that their results differed from Nogues (2008) because by using a CGE model they were taking into account the general equilibrium effects of the export taxes.

Like Cicowiez et al. (2009), we used the static standard-CGE-model presented in Lofgren et al. (2002). Due to data availability problems we had to use the year 2000 as the base year. We simulated the implementation of the export tax structure of 2007, including the ad valorem equivalents of quantitative export restrictions. Our results tend to confirm those obtained by Nogues (2008). We show that the export taxes and quantitative export restrictions that were in place in 2007 have strong negative effects on overall GDP, unemployment and household welfare.

JEL codes: D58, F14, O13, O54, Q18

Content

1. Introduction

At the height of the commodity price boom in 2007 and 2008, several food-importing and exporting countries reported internal uprisings. In most countries, poor urban populations demonstrated against the increased internal food commodity prices that lowered their real purchasing power (Trostle, 2008). However, Argentina stands as an interesting exception. There, farmers and farm workers, rather than the urban poor, lead the demonstrations and street blockades between March and June 2008. The demonstrations and blockades broke out after the Argentine government announced an increase in export taxes on agricultural products that amounted to almost 50 percent for some products. Since then the country has experienced a heated public debate about the domestic, economic and social consequences of taxing agricultural exports. Nogues (2008) conducted a partial equilibrium analysis pointing out the negative consequences of export taxes for GDP, the unemployment rate and poverty. Cicowiez et al. (2009) used a CGE-model for the Argentinean economy, choosing 2005 as the base year, and showed that the elimination of export taxes on agricultural products had negative effects on GDP, unemployment and poverty. They argued that their results differed from Nogues (2008) because by using a CGE model they were taking into account the general equilibrium effects of the export taxes.

This research contributes to the ongoing discussion. It uses a similar CGE model as the one used by Cicowiez et al. (2009), but reaches different results. Our results tend to confirm those obtained by Nogues (2008). We show that the export taxes and quantitative export restrictions that were in place in 2007 have strong negative effects on overall GDP, unemployment and household welfare.[4]

2. Methodology and Data

Like Cicowiez et al. (2009), we used the static standard-CGE model presented in Lofgren et al. (2002), but we did not include a micro-simulation model. In contrast to Cicowiez et al. (2009, p. 8) our CGE model includes the typical CGE feedback effects going from demand changes to supply changes. We used a Leontief-Function of the quantities of value added and aggregate intermediate input at the top level of the nested production function, because there was no data available for Argentina on the sectoral elasticities of substitution between value added and aggregate intermediate input (Lofgren et al., 2002, p. 8). Cicowiez et al. (2009) did not publish their Social Accounting Matrix (SAM) with base year 2005 for Argentina, so we had to use the existing SAMs for Argentina, which are based on the input-output table of 1997 (Instituto Nacional de Estadísticas y Censos (INDEC), 2001). We used the SAM from the International Food Policy Research Institute (IFPRI) for the year 2000 (Argentina, 2005) and disaggregated the factor accounts using coefficients obtained from the SAM for Argentina from the GTAP 6 database (Méndez

[4] The export taxes and quantitative export restrictions currently in place in Argentina are even higher than those used in the simulation of our paper for 2007 (Ministerio de Economía y Producción, 2008a, 2008b).

Parra, 2006). The reason for using the SAM from the IFPRI as the base is that 2001, the base year of the GTAP 6 data base, was a year of severe recession in Argentina.[5]

We also disaggregated the household accounts of the IFPRI SAM using the Argentine household survey ENGH 1996/1997 (INDEC, 1998).[6] Due to a lack of information concerning the allocation of factor incomes from the constructed SAM to the household categories of the ENGH 1996/97, we defined our own household categories using the functional income distribution. Capitalist households (CapHH) receive the factor income of the production factors land and capital, skilled labor households (SkilledHH) the factor income of skilled labor, rural unskilled households (RurUnskHH) the factor income of unskilled labor employed in agricultural sectors and urban unskilled households (UrbUnskHH) the factor income of unskilled labor employed in non-agricultural sectors. We assigned consumption patterns from the ENGH 1996/97, based on the personal income distribution, to our household categories in the following way: The average consumption patterns of the lowest four decentiles were assigned to RurUnskHH and UrbUnskHH, the average consumption patterns of the fifth to eighth decentiles to SkilledHH, and the average patterns of the highest two decentiles to CapHH (see Table 3).[7] The resulting imbalances between supply and demand for certain sectors in the SAM were balanced by adjusting the capital payments of the production sectors.[8]

After aggregating some production sectors, our SAM 2000 for Argentina, which we used to calibrate the CGE model, includes 26 production and corresponding commodity sectors, 5 production factors (unskilled labor in agriculture/non-agriculture, skilled labor, capital and land) and the described 4 household categories.[9] The classification of agricultural and non-agricultural sectors is presented in Table 1.

Unskilled agricultural labor is only fully mobile within the agricultural sectors, and unskilled non-agricultural labor is only fully mobile within the non-agricultural sectors, whereas skilled labor is fully mobile over all sectors.[10] In the short run, capital and land

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[5] We did not use the GTAP 7 database because we did not have access to it. In any case, the SAM for Argentina in the GTAP 7 database is only an update of the same SAM in the GTAP 6 database to the year 2004 (using the Argentinean national accounts for the year 2004). As a result, there would not be a huge gain of information on structural parameters in using the GTAP 7 SAM.

[6] The data base of the ENGH 1996/1997 was provided by Martín Cicowiez of the National University of La Plata (Argentina).

[7] We include all tables and graphs in the Appendix.

[8] This balancing procedure is justified by the difficulties in measuring sectoral capital payments that occur in developing countries and lead to already distorted estimates of sectoral capital payments in the SAM (Shoven & Whalley, 1992, p. 107).

[9] It also includes production taxes, sales taxes, import tariffs, direct income taxes for households, government subsidies to enterprises and government transfers to households. The names of the production sectors start with an A (as activity) and the names of the corresponding commodity sectors with a C (see Table1).

[10] To be able to compare our results to those obtained by Cicowiez et al. (2009), we also conducted simulations using an integrated labor market for unskilled labor (unskilled labor is fully mobile over all sectors). The results are exactly the same as in our main simulation with segregated labor markets for

are sector-specific and cannot migrate between sectors. In the long run, capital is fully mobile and land can only be reallocated between agricultural sectors. We conducted each simulation with four different closure rule combinations. We distinguished the short run specification from the long run specification and conducted these two simulation runs with the assumption of unemployment of unskilled labor in agricultural and non-agricultural sectors. In order to test the robustness of our results, we also conducted the short and the long run specifications with full employment of unskilled labor in agricultural and non-agricultural sectors.[11] For skilled labor we used the full employment specification in each closure rule combination.[12] The closure rule for unemployment of a factor follows the specification of Lofgren et al. (2002). The factor wage of the unemployed factor is fixed exogenously and the factor supply is free to vary and equilibrates the factor market. That means that the factor wage is rigid in both upturns and downturns.[13]

In all closure rule combinations we specified the foreign capital flows and the nominal exchange rate as exogenous. This premise conforms to the political and economic conditions that have existed in Argentina since 2003.[14] The production and the consumption price indices are endogenous.[15] In the short run, the government deficit is free to vary, whereas in the long run it is fixed. The adjustment of the government budget in the long run is attained through endogenous direct income tax rates. These tax rates are fixed in the short run. In each closure rule combination we used a balanced closure for

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unskilled labor (see the discussion of the robustness of the model in chapter three). The detailed results can be obtained from the author.

[11] The specification of unemployment of unskilled labor fits better with the Argentine reality since 2002. The unemployment rate reached a peak of 21% in 2002 and in 2007 it was still around 9% (Heyman, 2006; Graph 1). To test the robustness of our results, we also conducted the short and the long run simulation with the full employment specification for unskilled labor. Interestingly, the main findings are almost the same with both specifications, although the magnitudes of the changes for some variables are higher for the unemployment specification (due to the decrease/increase of the total amount of unskilled labor used in the economy).

[12] Cicowiez et al. (2009) assumed unemployment for all labor types in their CGE model. We think using the full employment specification for skilled labor fits better with Argentina's economic reality. For robustness tests we also conducted a simulation with unemployment for all labor types and we obtain the same results as those presented in this paper (see discussion of the robustness of the model in chapter three). The detailed results can be obtained from the author.

[13] The assumption that the wage for unskilled labor is also rigid in downturns seems to fit with the Argentinean political and economic conditions in the urban industry sectors. The unions are strong and employment protection is high (Galiani & Gerchunoff, 2003).

[14] Since 2003 the Argentine government has tried to keep the exchange rate at 3:1 with the US Dollar (Heymann, 2006, Graph 2). After the default in 2002 it was very difficult for the Argentinean government and for Argentinean companies to issue debt in international capital markets. Therefore, the assumption of fixed foreign capital flows is reasonable.

[15] The assumption of endogenous consumer and producer price indices also conforms to the Argentinean economic reality since 2003. In spite of various orthodox and unorthodox measures of the government to calm inflation (unorthodox measures include price controls and negotiations with food retailers), the consumer price index has risen 160% from 2003 until 2008 (yearly inflation of 32%; Graph 3). So it is valid to assume endogenous price indices.

the savings-investment balance. The absorption shares of investment and government consumption are fixed in nominal terms, and the saving rates of all households are free to vary. This means that any exogenous shock on the economy causes simultaneous adjustments in all three components of domestic absorption, private consumption, government consumption and investment. This specification is an important difference from the model specification of Cicowiez et al. (2009, p. 10), which puts the entire adjustment burden on the households.[16]

In the case of the sectoral import substitution elasticities (Armington elasticities), we used the same values Cicowiez et al. (2009) used in their CGE model.[17] We obtained the factor substitution elasticities and the income elasticities of demand from the GTAP 6 database. For the transformation elasticities we used the same values as for the import substitution elasticities because there were no other estimates available for Argentina.[18] We also included data for sectoral labor employment, which we obtained from the input-output statistics of the National Statistics Agency of Argentina (INDEC, 2001).[19] To test the robustness of our results, we conducted sensitivity analyses with different standard values for the elasticities.[20]

Following Lofgren et al. (2002), we defined Argentina as a small country on both the import and the export side. Cicowiez et al. (2009, p. 10) defined Argentina as a big country on the export side. They used the presented price elasticities of export demand (Table 4), which they obtained from the global LINKAGE model.[21] We think that these estimates for the price elasticities of export demand justify our assumption of an infinitely elastic export demand for Argentinean exports.

3. Model simulations and results

In the base year 2000 there were no export taxes in Argentina. We simulated the implementation of the export tax structure of 2007, including the ad valorem equivalents of quantitative export restrictions, because Nogués (2008) investigated the effects of abandoning the same export tax structure (Table 5).[22] As the table shows, this export tax

[16] We believe that our closure rule specification conforms better to the Argentinean political and economic conditions since 2003 than the one used by Cicowiez et al. (2009).

[17] Martín Cicowiez provided us with these elasticity values, which he obtained from the global LINKAGE model of the World Bank (van der Mensbrugghe, 2005).

[18] This is a common procedure in CGE modeling (de Melo & Robinson, 1989, p. 59).

[19] We used the coefficients obtained from the GTAP 6 SAM for Argentina to disaggregate the sectoral labor demand in skilled and unskilled labor.

[20] We used 3 for the import substitution and transformation elasticities, 0.7 for the factor substitution elasticities and 1 for the income elasticities of demand. In a second run we used 0.8 for the import substitution and transformation elasticities.

[21] Martín Cicowiez also provided us with these elasticity values. We are very thankful for his support.

[22] We are aware that, due to the limited data availability for Argentina, our base scenario does not include the huge real devaluation that took place in Argentina 2002. But the calibration procedure of the CGE model computes major structural coefficients out of the SAM, which do not vary substantially due to a real devaluation. We also conducted a simulation of a real devaluation to see how it affects the performance of

structure imposes higher taxes for primary agricultural products than for processed food products. These types of differential export taxes (DET) are implemented to promote the processing industries by lowering the prices of their domestically produced inputs relative to their output price (infant industry argument). As we will show in this paper, such a strategy only works in the short run when the production of primary products is price inelastic due to the immobility of the factors capital and land. But the DET strategy is ineffective and could even harm the processing industries in the long run.[23] To test the robustness of our results, we also simulated a smaller export tax increase (Table 5).

Due to our four different closure rule combinations, we conducted four different simulation runs for each simulation. For the main simulation of introducing the 2007 export tax structure these four runs are labeled as follows: short/long run with unemployment of unskilled labor (ETAX07SRUE/ETAX07LRUE) and short/ long run without unemployment of unskilled labor (ETAX07SR/ETAX07LR). We consider the short and long run simulations with unemployment of unskilled labor to be our main simulations. The simulations with full employment of unskilled labor serve to underline the robustness of our results.

Our findings show that the export taxes on agricultural products increase the domestic supply of certain food products and lower their internal prices in the short run (Table 8, 9). The reason for this is that the output of the agricultural sectors can only react slightly to the negative price incentives in the short run and, due to the export taxes, a substantial amount of the production is redirected from exports to the domestic market (Table 10). The production is very price inelastic in the short run because many agricultural sectors in Argentina are very intensive in capital and land, these two production factors being immobile in the short run (Table 7). But in the long run, export taxes lead to a strong reallocation of capital and skilled labor from agricultural to non-agricultural sectors, resulting in a sharply decreasing food production and a decreasing domestic food supply for many sectors (Table 9, 13). This, in turn, leads to rising internal prices for some sectors when comparing the long run to the short run scenario. But in spite of a decreased domestic supply for almost all sectors, the prices are lower in the long run than in the base year. This is only due to a general reduction in domestic absorption and consumption demand caused by the implementation of the export taxes. Real domestic absorption decreases by 1.4% in the short run and 2.8% in the long run. Total real

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the economy. The detailed results of these simulations can be requested from the author. The question of how much the nominal devaluation in 2002 benefited the Argentinean agricultural producers and how long this stimulating effect lasted will be discussed in the conclusion. With our CGE model we exclusively investigate the economic and social consequences of the agricultural export taxes and our results challenge the findings of Cicowiez et al. (2009).

[23] The export tax structure also includes high export taxes on petroleum and gas (45%), which benefit the agricultural sectors by decreasing input prices in the short run (oil and gas are important inputs for agricultural production in Argentina). Interestingly, our results show that due to the high export taxes and the reduced profitability the production of oil and gas decreases 40% in the long run. This reduces the domestic supply so much that prices for oil and gas increase 4.2% in the long run relative to the base scenario (Table 8-10, 13).

household consumption decreases by 1.2% in the short run and 2.5 % in the long run (Table 28, 29).[24]

Contrary to the findings of Cicowiez et al. (2009), the flows of capital and skilled labor from agricultural to non-agricultural sectors, caused by the implementation of the export taxes, do not decrease unemployment or increase GDP. In the short run the amount of workers in the agricultural sectors decreases by 4.7% and in the non-agricultural sectors it decreases by 4.5%. In the long run the respective figures are -9.4% and -8.3% (Table 19). The reason for the increased unemployment of unskilled labor in agriculture is that the production in agricultural sectors decreases in both the short and the long run due to the negative price incentives caused by the export taxes (Table 9).[25] All agricultural sectors reduce their demand for unskilled labor causing the unemployment of unskilled labor to rise (Table 14).[26] In the long run the capital flows from agricultural to non-agricultural sectors cause the real marginal product of agricultural unskilled labor to decrease more sharply, which leads to a higher reduction in demand for agricultural unskilled labor and higher unemployment (compare 9.4% to 4.7%).

The reason for the increase of unemployment of unskilled labor in non-agricultural sectors is that only a few non-agricultural sectors benefit strongly from the decreasing factor wages for capital and skilled labor, which are caused by the layoffs in the agricultural sectors due to the export taxes (Table 20).[27] Those benefiting sectors, mainly metal production and the manufacturing industry (AMEMPROD, AMAEQOTM), hire skilled labor in the short run and large quantities of capital and skilled labor in the long run (Table 16, 17). This considerably increases the real marginal product of unskilled labor in those sectors and leads these industries to hire more unskilled labor, in spite of the increased relative price of this production factor. The relative price of unskilled labor increases because the prices for capital and skilled labor decrease due to the layoffs in the agricultural sectors, and the price for unskilled labor is fixed by assumption (Table 20).[28] The relative increase of the price for unskilled labor causes that most non-agricultural sectors reduce their factor demand for unskilled labor, even if they increase production

[24] Remarkably, we obtained the same results using the full employment specification, only the magnitudes of the changes are smaller. Real domestic absorption decreases 0.2% in the short run and 0.5 % in the long run. Total real household consumption decreases 0.1% and 0.3% in the short and the long run respectively (Table 28, 29).

[25] The only exception is the sector AVEGFR, which expands in the long run. But due to the increased relative wage of unskilled labor it also reduces its demand for unskilled labor (see next paragraph in the text).

[26] Even when we allow for migration of unskilled labor between agricultural and non-agricultural sectors, the overall unemployment of unskilled labor increases by 4.5% in the short run and 8.4% in the long run due to the implementation of export taxes (Table 33).

[27] The average factor wages of capital and land only decrease in the long run, because capital and land cannot migrate between sectors in the short run. In the short run the average wages of these factors are exogenous and only the sector specific wages of capital and land vary (Table 21, 22).

[28] In the short run the relative price of unskilled labor only increases relative to the price for skilled labor, because capital is immobile in the short run and its average price does not change.

(Table 9, 15).[29] An important fact driving the results is that the three sectors, which employ about 81% of the unskilled labor in non-agricultural sectors (ACONSTR, AGOBIERNO and ASERVICIOS), are all reducing their demand for unskilled labor in both the short run and the long run (Table 15). The fact that the reduction of the factor demand for unskilled labor is twice as high for these sectors in the long run compared to the short run accounts for the high increase in unemployment of non-agricultural unskilled labor in the long run.[30]

Overall, the export taxes lead to a downturn of total real GDP, which amounts to 1.4% in the short run and 2.7% in the long run (Table 29). The increase of production and value added in some non-agricultural sectors caused by the reallocation of capital and skilled labor from agricultural sectors, does not compensate for the large production decreases in the agricultural sectors (Table 9, 30). Another important fact driving the results is that the service sectors (AELECTRI, AGOBIERNO and ASERVICIOS) and the construction industry (ACONSTR), which represent about 58% of Argentinean GDP, are harmed indirectly by the agricultural export taxes as well (Table 2, 30). Output and value added decrease in these sectors in the short run by 0.3%, 1.8%, 1.5% and 1.8% respectively, and by 3.1%, 3.4%, 2.5% and 3.9% in the long run (Table 9, 30).[31]

This negative indirect effect of export taxes on some non-agricultural sectors is related to the contraction of total domestic real absorption caused by the export taxes. Due to the implementation of the export taxes, the exports of many agricultural and food-producing sectors decrease sharply (Table 11). This creates an imbalance in the current account putting pressure on the real exchange rate to devaluate. Because the nominal exchange rate and the foreign capital flows are fixed, the only possibility for the real exchange rate to devaluate is through a contraction of domestic prices and wages. The domestic consumer price index decreases by 3.1% in the short run and by 5.5% in the long run and the domestic producer price index decreases by 4% and 6%, respectively (Table 28).[32] In the long run, the average wages for skilled labor, capital and land decrease by 6.4%, 7.2%

[29] Due to the rigid wage of unskilled labor, production in all sectors becomes more intensive in capital and skilled labor.

[30] A fourth sector contributing to this result is the oil refining industry (AREFOIL). In the short run the price of its input COIGAMIN decreases sharply by 33.1% due to the export tax of 45%. This leads to an expansion in the output of AREFOIL of 4% and the demand for unskilled labor increases by 34%. But in the long run the production of COIGAMIN declines sharply by 40% and the price rises 4.2% in comparison to the base. This leads to a 6.3% reduction of the production of AREFOIL and a 14% decrease of the demand for unskilled labor compared to the base.

[31] Since we used the Leontief-Function at the top level of our nested production function, there are no possible substitution effects between aggregated inputs and value added. Output, value added and aggregated inputs change by the same percentage points.

[32] The fact that since the implementation of the export tax structure in 2007 there has been an accelerating inflation in Argentina does not contradict the findings of this paper. First, the inflation in Argentina has many reasons, mainly rising world food prices, failing macroeconomic policies to mitigate inflation, and excessive government spending, etc. Second, our CGE model is a real and static microeconomic model, which could not be used to model inflation mechanisms or to forecast macroeconomic processes. For the purpose of investigating the causes and mechanisms of inflation one has to use macroeconomic DSGE models.

and 60.7%, respectively. In the short run only the average wage of skilled labor decreases by 3.3%, because capital and land are sector specific. The average wages of land and capital stay constant in the short run, but the sector specific wages for capital and land decrease sharply in the agricultural sectors as well as the sector specific wages for capital in many non-agricultural sectors (Table 21, 22). The decrease in domestic prices and wages leads the real exchange to devaluate by 4.2% in the short run and by 6.3% in the long run (Table 28). This causes the exports of some non-agricultural sectors to rise significantly in the short run and even more in the long run (Table 11). In particular, the exports of the chemical, metal production and manufacturing industries (CCHEMPROD, CRPOTNMMP, CMEMPROD and CMAEQOTM) benefit strongly from the real devaluation caused by the export taxes. In the long run the exports of these sectors grow by 33.1%, 21.1%, 34.3% and 36%, respectively. Due to the reallocation of capital and skilled labor, the production in these four sectors increases in the long run by 4.7%, 3.5%, 11.1% and 12.8%, respectively (Table 9).

But the rise in the exports of some non-agricultural sectors cannot compensate for the large losses in the agricultural and other non-agricultural sectors, which for some sectors amount to over 60% (Table 11).[33] Total real exports decrease by 8.6% in the short run and by 16.6% in the long run (Table 28). Due to the loss of export revenues the real import demand has to decrease as well. The real devaluation causes total real imports to decline by 8% in the short run and by 15.4% in the long run. Imports in every single sector decrease sharply in the short and the long run (Table 12).[34] In sum, the implementation of the export taxes causes total real domestic absorption to decrease by 1.4% in the short run and 2.8% in the long run. Real consumption demand of private households decreases by 1.2% in the short run and 2.5% in the long run, real government demand by 1.9% and 3.3% respectively, and real investment demand by 1.9% and 3.8%, respectively (Table 28). This contraction on the demand side, caused by the real devaluation and the declining real incomes of the households (see further down), has negative effects on some non-agricultural sectors, especially the three service sectors previously mentioned (AELECTRI, AGOBIERNO and ASERVICIOS) and the construction industry (ACONSTR). Since these four sectors represent a major part of the Argentinean GDP, the total real GDP decreases by 1.4% in the short run and 2.7% in the long run.

Another interesting finding is that export taxes on agricultural products cause a substitution of imports by domestic production in many non-agricultural sectors. The quantity of domestic marketed output increases slightly for a lot of sectors while imports decrease sharply (Table 10, 12). In sum, the total quantity supplied and demanded in the domestic market decreases in a lot of sectors (Table 13).[35] The phenomenon of import

[33] Due to the export tax of 45% the exports of oil and gas (COIGAMIN) shrink by 46.2% in the short run and 94.4% in the long run (Table 11).

[34] The only interesting exception is the highly taxed oil and gas sector (COIGAMIN), which has to increase its imports in the long run by 10.4% due to the sharp fall in domestic production (Table 9, 12).

[35] The exceptions are COIGAMIN and CVEGOIL (supply only increases in the short run, but declines significantly in the long run), CWHEAT, CVEGFR, CLVSTMIWO, CMEAT and CCEREAMILL (small

substitution is strongest for the four sectors CCHEMPROD, CRPOTNMMP, CMEMPROD and CMAEQOTM. In the long run, the production is stimulated significantly by the falling factor prices for capital and skilled labor and the domestic marketed output increases, substituting for imports in these sectors (Table 9, 10). But exports of those sectors increase more sharply than the domestic marketed output (Table 11). The international competitiveness of these sectors is strongly enhanced by the decreasing domestic factor and input prices and, accordingly, the real depreciation of the currency. These four production sectors, the companies, the capital owners and the workers involved in those sectors, are the main beneficiaries of the export taxes on agricultural products.

Household welfare

Our CGE model does not include the special household categories necessary to model the exact effects of the export taxes on the capital owners and workers related to the above-mentioned benefiting sectors. But we can infer that due to the rigid wages of unskilled labor, the real wages of unskilled workers in the benefiting sectors increase because of the decreasing consumption price index. Due to the fact that no unskilled workers are laid off in the two benefiting sectors, metal production and the manufacturing industry (AMEMPROD, AMAEQOTM), neither in the short nor in the long run, every single unskilled worker employed in those sectors in the base year will be better off after the implementation of the export taxes.[36] In the benefiting sector ARPOTNMMP all unskilled workers will benefit in the short run, but in the long run 1% of the unskilled workers will be laid off because of the rising relative factor price of unskilled labor. In the sector ACHEMPROD 1% of the unskilled workers are laid off in the short run and 3.4% in the long run. Therefore, not all of the unskilled workers employed in these two sectors in the base year will benefit from the implementation of the export taxes. The capital owners in the benefiting sectors will gain in the short run, because their sector-specific profits increase in the short run (except CCHEMPROD, whose profits decrease slightly by 0.9%) and consumption prices decrease by 3.1% (Table 21).[37]

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supply increases in short and long run) and CDAIRY, CMEMPROD (small increases only in the long run)(Table 13).

[36] Even for skilled workers, whose average wage decreases by 3.3% in the short run and 6.4% in the long run, one could assume that the skilled workers already employed in the benefiting sectors in the base year would not lose wage income due to the implementation of the export taxes. The lower wage rate would only be paid to the newly hired skilled workers. One reason why wages for those skilled workers already employed in the benefiting sectors in the base year would not decline, is that companies have already invested in the human capital of their skilled workers, thus, replacing them by cheaper skilled workers coming from other industries would entail costs for the companies. If the wage for the skilled workers employed in the benefiting sectors in the base year did not decline, that would imply that every skilled worker employed in the base year would benefit from the implementation of the export taxes because no skilled worker is laid off in the benefiting sectors and average consumer prices decrease. These effects are not modeled in our CGE model.

[37] In the long run the average factor price of capital decreases by 7.2% (Table 20). But one could assume that for the capital owners who own equity of the firm the capital units already employed as investment goods in the benefiting sectors in the base year still give a higher dividend in the long run than the average unit of debt capital in the economy. This phenomenon cannot be modeled in our CGE model.

In our CGE model there is only one household category representing all unskilled workers in the non-agricultural sectors (UrbUnskHH). That household category receives the income of all factor units of non-agricultural unskilled labor. The layoffs of unskilled labor in many non-agricultural sectors reduce the income of our urban unskilled labor household, although the wage is rigid and constant in the short and the long run.[38] Our CGE model cannot model the heterogeneous effects of the export taxes on different non-agricultural unskilled workers employed in different sectors. The same is true for the other household categories representing the socioeconomic groups of unskilled workers in agricultural sectors (RurUnskHH), skilled workers (SkilledHH) and the owners of capital and land (CapHH). We can only analyze the effects of the implementation of the export taxes on our aggregated household categories.

Due to the implementation of the export taxes, the unemployment of unskilled labor in the agricultural sectors rises by 4.7% in the short run and 9.4% in the long run. This reduces the nominal income of our representative rural unskilled labor household (RurUnskHH) by 4.7% in the short run and 8.9% in the long run (Table 23). After deducting savings we obtain the nominal consumption expenditure, which decreases by 4.2% in the short run and 8.8% in the long run (Table 24). The special consumption price index for that household group decreases by 3.5% in the short run and 5.6% in the long run (Table 25).[39] This leads to a decrease in the total real consumption of RurUnskHH by 0.2% in the short run and 2.8% in the long run (Table 26). The welfare of the household group, measured as the equivalent variation relative to the total consumption value of the household group in the base year (in %), decreases by 0.3% in the short run and by 2.8% in the long run (Table 27). This means that the household group of unskilled workers in the agricultural sectors is hurt by the implementation of the export taxes in both the short and the long run.

The unemployment of unskilled labor in non-agricultural sectors increases by 4.5% in the short run and 8.4% in the long run. The nominal income of the households of unskilled workers in non-agricultural sectors (UrbUnskHH) decreases by 3.8% and 7.5% respectively, and consumption expenditure decreases by 3.5% and 7.4%, respectively. The consumption price index for UrbUnskHH decreases by 3.2% and 5.6%, respectively. Total real consumption does not change in the short run and decreases by 1.5% in the long run. The welfare of the UrbUnskHH stays constant in the short run and decreases by 1.5% in the long run. The wage of skilled labor decreases by 3.3% in the short run and by

[38] The same is true for the rural unskilled labor household (RurUnskHH), which receives the factor income of all unskilled workers employed in agricultural sectors. Our CGE model does not include the possibility of unemployment benefits from the government. We implicitly assume with our household categories that the unemployed unskilled workers are supported by their employed colleagues in the agricultural or non-agricultural sectors, and that rising unemployment within these special socio-economic groups (rural or urban unskilled households) negatively affects the income of the whole group. In reality, there will be negatively affected and positively affected households within the same socio-economic group of households. The unskilled workers who keep their jobs will benefit from the export taxes because their wages are rigid and consumer prices decline.

[39] GAMS computes a special consumption price index for each household group. The single product prices in the index are weighted by the marginal consumption shares of the products for that special household group.

6.4% in the long run. This leads to a decline in the nominal income of the skilled labor households (SkilledHH) of 3.3% and 6.5%, respectively. The consumption expenditure decreases by 2.8% and 6.4% respectively, and the consumption price index for the SkilledHH decreases by 3% and 5.3%, respectively. In sum, total real consumption increases in the short run by 0.4%, but decreases in the long run by 0.8%. The welfare of the SkilledHH increases by 0.4% in the short run, but decreases by 0.8% in the long run (Table 27). In the short run, the UrbUnskHH and the Skilled HH benefit from the implementation of the export taxes, whereas they are harmed by the export taxes in the long run.[40]

The household group that suffers the most from the implementation of the export taxes is the group of capital and land owners (CapHH). The overall nominal income of this household group decreases by 5.9% in the short run and by 8.8% in the long run. The consumption expenditure decreases by 5.4% and 8.7% respectively, and the consumption price index for CapHH decreases by 2.7% and 5%, respectively. In sum, the real consumption of CapHH decreases by 2.6% in the short run and 3.6% in the long run. The welfare decreases by 2.6% and 3.6%, respectively. The group of capital and land owners as a whole is harmed significantly by the implementation of the export taxes in both the short run and the long run.

But beneath the surface there is major heterogeneity within the group of capital and land owners, which could not be detected by our household category. The sector specific factor wage for land is decreasing sharply in all agricultural sectors in the short run (e. g. by 54.7% for the wheat sector), and in the long run the average factor wage of land decreases by 60.7% (Table 20, 22).[41] The sector-specific wage of capital decreases sharply in the agricultural sectors in the short run (e.g. by 54.7% in the wheat sector; Table 21).[42] The agricultural producers in Argentina, who own land and capital used in agricultural production, are hurt significantly by the implementation of the export taxes in the short and the long run. An important fact that helps understand the upheavals from March-June 2008 in Argentina is that Argentinean agricultural producers are not merely big agricultural companies. The overwhelming majority, about 83%, of all agricultural enterprises in Argentina cultivate an area smaller than 500 ha (Table 6). The export taxes especially hurt these small agricultural producers because in the long run it is generally easier for the bigger agricultural producers and companies to reallocate their investments to other countries or sectors (Piermartini, 2004, p. 6).[43] The small agricultural producers suffer in the long run because they often do not have the opportunities or the skills to dedicate their efforts to other sectors or move their production to other countries.

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[40] The welfare of the UrbUnskHH does not change from the base year to the short run equilibrium. We interpret this as beneficial.

[41] The high decrease of the factor wage of land in the long run is due to the reallocation of capital from agricultural to non-agricultural sectors, which lowers the real marginal product of land.

[42] In the long run the average factor wage of capital in the Argentinean economy decreases by 7.2%.

[43] A very good example for this statement is the fact that many bigger Argentinean cattle producers moved their production to neighboring Uruguay (The Economist, 2009). The production of cattle in Argentina is currently lower than the cattle production in its much smaller neighbor Uruguay.

As mentioned above, capital owners in some non-agricultural sectors gain from the implementation of the export taxes in the short run. These are the capital owners in the chemical, metal production and manufacturing industries (ACHEMPROD, ARPOTNMMP, AMEMPROD and AMAEQOTM), as well as the capital owners in the oil refinery industry (AREFOIL) and the cereal-processing industry (ACERALMILL) (Table 21).[44] Other capital owners in non-agricultural sectors are hurt significantly by the implementation of the export taxes in the short run, especially the capital owners in the oil and gas industry (AOIGAMIN) and the oilseed processing industry (AVEGOIL), whose profits decrease by 71.1% and 36.1%, respectively. In the long run capital is mobile between sectors and the average factor wage decreases by 7.2%. Under the assumption of full mobility of capital every capital owner in both the non-agricultural and agricultural sectors is hurt by the implementation of the export taxes in the long run.[45] The welfare of our CapHH decreases by 3.6% in the long run.

Robustness of the model

The results of our main simulation presented in the preceding sections are highly robust. We obtained similar results using the full employment specification for unskilled labor in agricultural and non-agricultural sectors. But the decreases of real GDP and real domestic absorption are smaller than in our main simulation because with the specification of full employment of unskilled labor there is no possibility of unemployed resources in the economy. The real GDP and real domestic absorption decrease by 0.2% in the short run and by 0.5% in the long run (Table 28, 29), whereas with unemployment of unskilled labor in agricultural and non-agricultural sectors, the GDP decreases by 1.4% and 2.7% respectively, and real domestic absorption decreases by 1.4% and 2.8%, respectively. With full employment of unskilled labor, the wage for unskilled labor in both agricultural and non-agricultural sectors is endogenous, and it decreases due to the implementation of the export taxes in both the short and the long run (Table 20). The wage for unskilled labor in agricultural sectors decreases by 16.6% in the short run and by 23% in the long run, and the wage for unskilled labor in non-agricultural sectors decreases by 2.3% and 4.2%, respectively. This leads to much bigger welfare losses for the unskilled labor households in the agricultural sectors than in our main simulation. Due to the huge wage decreases, the welfare of the RurUnskHH decreases by 10.1% in the short run and by 13.4% in the long run (Table 27). The households of capital and land owners are also hurt by the export taxes in both the short and the long run. However, the unskilled labor households in the non-agricultural sectors and the skilled labor households benefit from the export tax implementation in the short run and the long run.

In spite of these differences in the welfare consequences of the implementation of the export taxes, the main mechanisms and consequences of the agricultural export taxes are

[44] The sectors of oil refinery and cereal processing benefit strongly in the short run because the domestic prices of their inputs decrease due to the implementation of the export taxes. In some other processing industries the losses in the sector-specific factor wages for capital are much smaller than the decrease of the consumption price for CapHH, which decreases by 2.7% in the short run. Therefore, the capital owners in these sectors also benefit in the short run (Table 21).

[45] Because the factor wage decreases by 7.2% and consumption price index for CapHH only decreases by 5%.

the same in the simulations with and without unemployment of unskilled labor. The export taxes lead to a contraction of domestic real absorption, a decrease in domestic wages and prices and a devaluation of the real exchange rate (Table 28). The main benefiting sectors are the chemical, metal production and manufacturing industries, which sharply increase their production, domestic supply and exports (Table 9-11). But this does not compensate for the decreases of production and exports in the agricultural as well as some non-agricultural sectors. The real GDP, total exports and total imports decrease in both the short run and the long run (Table 29). The phenomenon of substitution of imports by domestic production is true for all non-agricultural sectors, but especially so for the four most benefiting industries (Table 10, 12).

To test the robustness of the results of our main simulation with unemployment of unskilled labor, we conducted several additional simulations. In one simulation we specified one integrated labor market for unskilled labor with unskilled labor being fully mobile between agricultural and non-agricultural sectors. For this simulation we constructed only one unskilled labor household (UnskHH). The results of this simulation are the same as the results of the main simulation. Due to the implementation of the export taxes, overall unemployment of unskilled labor increases by 4.5% in the short run and by 8.4% in the long run (Table 33). Real GDP decreases by 1.4% and 2.7% respectively, and real domestic absorption by 1.4% and 2.8%, respectively (Table 32). The total real private consumption decreases by 1.2% and 2.5%, respectively. Unskilled labor households and skilled labor households benefit in the short run, but are hurt by the export taxes in the long run (Table 35).[46] The households of capital and land owners are hurt by the export taxes in the short run and the long run.[47] For the benefiting sectors, production and export increases are the same as in the main simulation (Table 36). The results for the discriminated sectors are also the same as in the main simulation. The detailed results can be obtained from the author.

We also conducted a simulation in which we used the unemployment specification for all labor types - for unskilled and skilled labor. We conducted this simulation with both integrated and separate labor markets for unskilled labor in agricultural and non-agricultural sectors. The results of these simulations show even stronger negative effects from the export taxes than the results of our main simulation.[48] The real GDP decreases by 2.1% in the short run and 4.2% in the long run (Table 38). Real domestic absorption decreases by 2.1% and 4.3%, respectively, and real private consumption by 1.9% and 3.8%, respectively. Unemployment increases for every labor type by about 5% in the short run and by about 9.5% in the long run (Table 39). All household groups are worse-off in the short run and in the long run due to the implementation of the export taxes

[46] The welfare for unskilled labor households stays constant in the short run and decreases by 1.6% in the long run. The welfare of skilled labor household increases by 0.4% in the short run and decreases by 0.8% in the long run.

[47] The welfare decreases by 2.6% in the short run and by 3.6% in the long run.

[48] In the Appendix we only present the results for the simulation with unemployment of all labor types and a separate labor market for unskilled labor. The results for the simulation with unemployment of all labor types and an integrated labor market for unskilled labor are very similar to those obtained in the simulation with a separate labor market. The results can be obtained from the author.

(Table 41). The pattern of benefiting and discriminated sectors is exactly the same as in the main simulation (Table 42). In another simulation we simulated a lighter stylized export tax increase (Table 5) and we obtain the same qualitative results as in our main simulation.[49]

We conducted all of the simulations mentioned using different values for the external elasticities (see chapter 2). Our results are very robust to varying elasticities. The export taxes on agricultural products that were in place in Argentina in 2007 decrease real GDP, real domestic absorption and private consumption in the short run and have an even stronger impact in the long run. Unemployment rises for every labor type that is modeled with the unemployment specification. The RurUnskHH and CapHH are harmed significantly by the export taxes in both the short and the long run. The UrbUnskHH and the SkilledHH gain in the short run and are harmed in the long run.[50] We consider the results of our main simulation as our final results and presented them in detail in this paper. The results of the other simulations can be obtained from the author.

4. Conclusions

In contrast to Cicowiez et al. (2009) we find that the implementation of agricultural export taxes in Argentina decreases real GDP and increases unemployment in both the short run and the long run. The export taxes distort domestic price signals and lead to an inefficient reallocation of production factors and an increasing amount of idle resources.[51] They especially harm the small- and medium size agricultural producers and the unskilled labor households employed in agricultural sectors. By decreasing the real exchange rate through a decline of domestic wages and prices, the agricultural export taxes implicitly protect some non-agricultural sectors, which significantly increase their production, exports and domestic marketed output. These sectors are the chemical, metal production and manufacturing industries. Especially in these industrial sectors, imports are heavily substituted for by domestic production, revealing that the implementation of agricultural

[49] We also conducted simulations assuming a flexible exchange rate. In the short run simulation with unemployment, GDP rises slightly by 0.03%, but it decreases in the long run by 0.19%. RurUnskHH and CapHH are worse off in the short and the long run, whereas SkilledHH and UrbUnskHH benefit from the export taxes in both time horizons. The pattern of benefiting and discriminated sectors is the same as in our main simulation. When using the full employment specification for all labor types, GDP decreases in the short and in the long run by 0.2% and 0.5%, respectively. The results for household welfare and sectoral output are similar to the simulations with unemployment. The detailed results of these simulations can be obtained from the author.

[50] In some simulations with the alternative elasticities the SkilledHH are harmed in the short and the long run and the UrbUnskHH benefit from the export taxes in the short and the long run. In the simulation with full employment of unskilled labor the SkilledHH and the UrbUnskHH benefit in the short and in the long run. We consider the assumption of unemployment of unskilled labor, which we made in our main simulation, as the correct representation of the Argentinean economic and political conditions. Therefore, we use the results of our main simulation for the conclusions.

[51] We were very surprised that Cicowiez et al. (2009, p. 21) found an optimal export tax of 43% for cereals, 52% for oilseeds and 36% for vegetable oils in a simulation maximizing the real GDP. These results seem very extreme given the highly elastic export demand assumed in their simulation, using the presented elasticities from the global LINKAGE model (see Table 4).

export taxes is continuing the old tradition of the import substitution industrialization (ISI) strategy in Argentina.

In the short run the export taxes benefit urban unskilled and skilled labor households but hurt rural unskilled labor households and the households of owners of capital and land, especially the agricultural producers. Therefore, the export taxes create a conflict of interest in the short run. This conflict of interest can be observed in recent Argentinean history. The Argentinean government, under Nestor Kirchner and his wife Christina, increased the export taxes in March 2008 to over 50% for some products in order to benefit their main constituency, the urban unskilled and skilled labor households. The government argued that the higher export taxes would mitigate the domestic impact of rising world food prices, and would thus reduce poverty within the poor urban population.[52] But that additional increase in export taxes created such a high cost for small, medium and large agricultural producers, as well as for the workers they employed, that they began to unite and protest against the measure. They blocked main roads, stopped agricultural production and disrupted the economy. The uprisings took place from March to June 2008 and were ultimately successful. In July, the Argentinean Senate, which is made up of representatives of all Argentinean provinces, overruled the bill that introduced the export tax increase.[53]

Besides creating this conflict of interest in the short run, the export taxes harm the welfare of every household group in the long run. Therefore, as far as Argentinean citizens are concerned with long-run developments, there should be a wide consensus in not implementing the export taxes on agricultural products that are currently in place. Officially, the government argues that besides mitigating the domestic impact of rising world food prices, the export taxes also stimulate value added in the processing industries, increase GDP, and lower unemployment and therefore poverty. We have shown with our simulations that the export taxes may stimulate the processing industry in the short run but ultimately harm many processing industries in the long run. The GDP decreases and unemployment increases in both the short run and the long run. In only the short run, some household groups belonging to the constituency of the Kirchner government benefit from the export taxes, whereas in the long run every single household is worse-off.

Thus, it is possible to conclude that the Argentinean government under Nestor Kirchner and his wife Christina is only interested in appealing to its constituency in the short run. The government is not concerned with the overall negative consequences of the agricultural export taxes in the long run. Another important motivation for the government to implement agricultural export taxes is that revenues from trade taxes do

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[52] The mitigation of rising food prices also benefits other urban net consumers of food, like the skilled households working in non-agricultural sectors. Over 99% of all skilled labor units were employed in non-agricultural sectors in the base year (Table 16).

[53] This was only possible because some members of Kirchner's governing coalition, which belonged to provinces that produce big parts of the Argentinean agricultural output, opposed the measure. The reason for this opposition by the agricultural provinces is that the revenues of any trade tax in Argentina are exclusively disposed of by the national government. The revenues of the export taxes do not enter the Argentinean fiscal federalist coparticipation system and stay in the hands of the national government.

not enter the fiscal federalist system in Argentina. The government can fully dispose of revenues from the export taxes and can use them for discretionary purposes.

This article does not argue strictly against implementing agricultural export taxes for a short period of time. In periods of severe crisis with plunging domestic tax revenues, export taxes could be a reasonable temporary measure to maintain the functioning of the public administration. In the case of Argentina, the export taxes were implemented during the crisis in the year 2002 after about a decade without taxing exports in the country. There was a broad consensus within the Argentinean society, including agricultural producers, that the modest taxes of 10-20% were a reasonable measure to make up for declining domestic tax revenues and to mitigate the impact of rising food prices after the devaluation, as long as this measure was temporary.[54] However, instead of eliminating the export taxes when the economy recovered, the government began to increase the export taxes and also introduced quantitative export restrictions.

In this paper we argue that the positive development of the Argentinean economy since 2003 was a result of, in addition to other factors, the rising world commodity prices. The introduction of export taxes did not contribute to this positive development, as Cicowiez et al. (2009) argue. Rather, progress was made in spite of the export taxes.[55] With falling commodity prices in 2008 and 2009, the negative consequences of the export taxes can now be fully observed in Argentina. Heavily taxed sectors like beef production, dairy products and wheat are facing huge production decreases as partly predicted by the long-run simulations of our CGE model (The Economist, 2009). This article argues, as Nogues (2008) does, that the negative short-run effects of rising world commodity prices on the welfare of poor urban households in food-exporting countries like Argentina should be targeted with consumption subsidies and not with price distorting export taxes. To finance these consumption subsidies in the short run, one should introduce a land tax or higher income taxes, or decrease production subsidies. Without the negative incentives of export taxes the agricultural production will respond positively to price increases in the long run, benefiting not only the Argentinean population, but also the populations of other food-importing countries.

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[54] The export tax revenues were also used to repay the Argentinean debt with the IMF.

[55] Cicowiez et al. (2009) also argue that the nominal devaluation of 2002 resulted in a strong real devaluation which is still benefiting the agricultural exporters. But we argue that due to the accelerating inflation in Argentina and the interventions of the Central Bank to keep the exchange rate around 3:1 to the US-Dollar, the real exchange rate computed with the producer price indices did appreciate so much that in 2009 it almost reached the level of the year 2000 (Graph 5). Taking into account the agricultural export taxes, the profitability of the agricultural exports per 1 US-Dollar in export revenues is already lower than in the 1990s (excluding movements in world commodity prices). Ciappa (2005) conducted such an analysis and found that already in the year 2004 the profitability for 1 US-Dollar in export revenues was lower than the average profitability in the 1990s.

To fully understand the problems that agricultural producers face in Argentina, one has to know that the government is also implementing maximum levels for domestic retail food prices. That is the main reason for the huge gap between the producer price index and the consumer price index in Graph 3. The government also began to manipulate the domestic consumer price index (CPI) in 2007, which is the reason why we also included an alternative CPI computed by the private research institution FIEL in Graph 3.

For future economic analyses using CGE models it is necessary for the data infrastructure in Argentina to be improved. Unfortunately, there was no social accounting matrix (SAM) available for Argentina, which is based on a newer version of the input-output table of 1997 and which would represent the Argentinean economy in its present state. Regarding the methodology used in this paper, it would be interesting to use a dynamic CGE model instead of a static one to investigate the economic and social consequences of agricultural export taxes in a dynamic context.

5. Appendix

5.1. Tables related to the SAM 2000 and external data

Table 1: Description of production and commodity sectors

	Activities	Commodities	Description
	Agricultural sectors		
1	AWHEAT	CWHEAT	wheat
2	AOTCEREAL	COTCEREAL	other cereals including maize, sorghum, barley, rye etc.
3	AOILSEEDS	COILSEEDS	soja, sunflower and other oilseed crops
4	AVEGFR	CVEGFR	vegetables, fruits and nuts
5	AOTCRSDSV	COTCRSDSV	other crops including rice, cotton, sugar cane, wine grape, olives, tobacco etc., production of seeds and planting material and agricultural services
6	ALVSTMIWO	CLVSTMIWO	livestock-farming, milk and wool and other animal products like poultry, honey and eggs etc.
7	AFISHFOR	CFISHFOR	fishing and forestry
	Non-agricultural sectors		
8	AOIGAMIN	COIGAMIN	extraction of oil, gas and minerals
9	AMEAT	CMEAT	slaughtering of animals and meat processing
10	AELABVEGFR	CELABVEGFR	processed vegetables and fruits
11	AVEGOIL	CVEGOIL	vegetable oils
12	ADAIRY	CDAIRY	dairy products
13	ACEREAMILL	CCEREAMILL	cereal flours
14	AOTPROCFD	COTPROCFD	other processed food including bakery, pasta, other manufactures of wheat, sugar, candies and chocolate, elaborated fish and feeding products
15	ABEVTOB	CBEVTOB	beverages and tobacco
16	ATXTWALEA	CTXTWALEA	production of textile fibers, wearing apparel and leather products, including shoe production
17	AWDPAPROD	CWDPAPROD	wood products, paper products and publishing
18	AREFOIL	CREFOIL	production of petrol and oils
19	ACHEMPROD	CCHEMPROD	chemical products including basic chemicals, plastic raw materials and synthetic rubber, soaps, paints, fertilizers and plaguicides, medical products etc.
20	ARPOTNMMP	CRPOTNMMP	products out of rubber and plastic like synthetic fibers, tyres etc. plus other non-metal mineral products like cement, glass and ceramic products
21	AMEMPROD	CMEMPROD	metal production and metal products except machinery and equipment

22	AMAEQOTM	CMAEQOTM	machinery and equipment including agricultural machinery and tractors, vehicles and transport equipment like ships, airplanes and locomotives plus other manufactures including household machinery, office machinery and computers, optical and medical equipment, furniture etc.
23	AELECTRI	CELECTRI	production collection and distribution of electricity
24	ACONSTR	CCONSTR	construction
25	AGOBIERNO	CGOBIERNO	government services like public administration, defense and compulsory social security programs
26	ASERVICIOS	CSERVICIOS	services including gas water and drainage, retail and wholesale trade, tourism, transport services, post, financial intermediation, insurances, real estate, television, radio and cinema, public and private health, education services and dwellings

Table 2: Economic structure in the base (year 2000)

	VAshr	PRDshr	EMPshr	EXPshr	EXP-OUTshr	IMPshr	IMP-DEMshr
CWHEAT	0.4	0.5	0.2	4.0	59.0	0.0	3.1
COTCEREAL	0.4	0.5	0.2	3.6	52.9	0.1	4.3
COILSEEDS	1.2	1.2	0.6	3.4	19.7	0.4	3.0
CVEGFR	2.6	1.7	1.5	1.6	6.1	0.5	2.6
COTCRSDSV	1.0	0.8	2.2	1.5	11.7	0.9	8.4
CLVSTMIWO	2.0	2.2	2.5	1.0	3.2	0.1	0.4
CFISHFOR	0.3	0.4	0.4	2.2	40.3	0.1	5.6
COIGAMIN	2.4	2.1	0.3	12.3	40.7	1.8	10.0
CMEAT	3.5	3.9	0.6	2.6	4.6	0.6	1.2
CELABVEGFR	0.2	0.4	0.3	0.6	9.2	0.3	7.5
CVEGOIL	0.4	1.3	0.1	13.4	71.7	0.3	6.7
CDAIRY	1.2	1.6	0.2	0.3	1.4	0.1	0.8
CCEREAMILL	0.2	0.5	0.1	0.6	8.2	0.1	2.3
COTPROCFD	3.7	3.6	1.9	4.8	9.1	1.3	3.1
CBEVTOB	1.7	2.0	0.6	1.4	4.5	0.3	1.4
CTXTWALEA	4.2	4.2	2.2	0.8	1.3	3.0	5.9
CWDPAPROD	2.3	3.0	1.6	1.7	3.8	3.6	8.8
CREFOIL	1.2	1.7	0.1	3.7	14.3	0.9	4.5
CCHEMPROD	5.0	4.5	0.7	4.9	7.4	11.3	17.6
CRPOTNMMP	1.9	2.2	1.7	2.2	6.7	4.8	15.7
CMEMPROD	1.8	2.4	1.1	4.6	12.7	4.2	13.6
CMAEQOTM	4.3	5.4	2.8	13.4	16.9	37.6	39.6

CELECTRI	2.3	2.2	0.4	0.5	1.6	0.7	2.2
CCONSTR	5.2	5.8	7.5	0.1	0.1		
CGOBIERNO	8.1	6.1	6.8				
CSERVICIOS	42.4	39.8	63.4	14.9	2.5	26.8	4.8
TOTAL-1	100.0	100.0	100.0	100.0	6.8	100.0	7.7
TAGR	8.0	7.2	7.6	17.3	16.2	2.2	2.9
TNAGR	92.0	92.8	92.4	82.7	6.1	97.8	8.0
TOTAL-2	100.0	100.0	100.0	100.0	6.8	100.0	7.7
TPROCFD	10.8	13.3	3.8	23.6	12.1	3.1	2.2
TIND	30.7	33.5	18.4	44.2	9.0	68.0	14.9
TSER	50.6	45.9	70.2	14.9	2.2	26.8	4.2
TOTAL-3	92.0	92.8	92.4	82.7	6.1	97.8	8.0

VAshr	Share of sectoral value added relative to GDP (in %)
PRDshr	Share of sectoral output relative to total output, measured in producer prices (in %)
EMPshr	Share of sectoral labor employment relative to total labor employment (in %)
EXPshr	Share of sectoral exports relative to total exports, measured in world prices (in %)
EXP-OUTshr	Share of sectoral export value, after export taxes, relative to sectoral output value, measured in producer prices (in %)
IMPshr	Share of sectoral imports relative to total imports, measured in world prices (in %)
IMP-DEMshr	Share of sectoral import value, after tariffs, relative to total sectoral commodity supply in consumer prices (in %)

Table 3: Household consumption patterns

	UnskHH	SkilledHH	CapHH
CWHEAT	0.01%	0.01%	0.01%
COTCEREAL	0.00%	0.00%	0.00%
COILSEEDS	0.03%	0.04%	0.04%
CVEGFR	4.40%	3.37%	2.08%
COTCRSDSV	0.03%	0.05%	0.04%
CLVSTMIWO	0.77%	0.47%	0.24%
CFISHFOR	0.11%	0.05%	0.02%
COIGAMIN	0.09%	0.05%	0.02%
CMEAT	10.11%	7.07%	4.14%
CELABVEGFR	0.64%	0.62%	0.51%
CVEGOIL	0.80%	0.46%	0.30%
CDAIRY	3.69%	3.04%	2.07%
CCEREAMILL	0.53%	0.19%	0.07%
COTPROCFD	9.76%	6.49%	4.19%
CBEVTOB	4.36%	3.83%	2.96%
CTXTWALEA	6.46%	6.08%	5.76%

CWDPAPROD	1.25%	1.63%	1.88%
CREFOIL	1.15%	1.92%	2.09%
CCHEMPROD	5.50%	5.98%	5.00%
CRPOTNMMP	0.42%	0.30%	0.26%
CMEMPROD	0.13%	0.14%	0.16%
CMAEQOTM	3.10%	3.68%	4.15%
CELECTRI	3.06%	2.15%	1.31%
CCONSTR	0.35%	0.39%	0.38%
CGOBIERNO	0.01%	0.02%	0.02%
CSERVICIOS	43.23%	51.96%	62.30%

Source: ENGH 1996/97

Table 4: Elasticities for Argentina from the Global Linkage model

	Import substitution elasticities	Priceelasticities of export demand
CWHEAT	5.08	10.15
COTCEREAL	5.08	10.15
COILSEEDS	4.75	9.5
CVEGFR	3.94	7.88
COTCRSDSV	3.94	7.88
CLVSTMIWO	3.94	7.88
CFISHFOR	4.31	8.62
COIGAMIN	4.31	8.62
CMEAT	3.94	7.88
CELABVEGFR	3.94	7.88
CVEGOIL	3.94	7.88
CDAIRY	3.94	7.88
CCEREAMILL	3.94	7.88
COTPROCFD	3.94	7.88
CBEVTOB	3.94	7.88
CTXTWALEA	4.11	8.22
CWDPAPROD	4.09	8.18
CREFOIL	4.09	8.18
CCHEMPROD	4.09	8.18
CRPOTNMMP	4.09	8.18
CMEMPROD	4.09	8.18
CMAEQOTM	4.09	8.18
CELECTRI		
CCONSTR		
CGOBIERNO		
CSERVICIOS	2.08	4.16

Table 5: Export structures[56]

	Export tax structure 2007 (in %)	Stylized export tax structure (in %)
Agriculture		
AWHEAT	32.5	10
AOTCEREAL	22.4	10
AOILSEEDS	27.5	10
AVEGFR	10	10
AOTCRSDSV	10	10
ALVSTMIWO	35	10
AFISHFOR	5	10
Processed Food Industry		
AMEAT	30	5
AELABVEGFR	5	5
AVEGOIL	24	5
ADAIRY	5	5
ACEREAMILL	5	5
AOTPROCFD	5	5
ABEVTOB	5	5
Other Industry		
AOIGAMIN	45	10
ATXTWALEA	0	0
AWDPAPROD	0	0
AREFOIL	0	0
ACHEMPROD	0	0
ARPOTNMMP	0	0
AMEMPROD	0	0
AMAEQOTM	0	0
AELECTRI	0	0
ACONSTR	0	0

[56] The 2007 export tax structure we obtained from Nogués (2008, p. 5). The export tax structure includes ad valorem equivalents of quantitative export restrictions affecting wheat and beef producers. Nogués (2008) obtained the data from World Trade Organization (2007).

Services		
AGOBIERNO	0	0
ASERVICIOS	0	0

Table 6: Firm size in Argentinean agricultural production

Area cultivated per firm (in ha)	Number of firms	Total area cultivated (in ha)
bis 500 ha	246,947	23,212,208
500,1 bis 2500 ha	38,062	41,751,127
2500,1 bis 10000 ha	9,629	47,034,473
größer als 10000 ha	2,787	62,810,758

Source: Censo Nacional Agropecuario (CNA) 2002 (INDEC)

Table 7: Factor intensities in the agricultural sectors

	AWHEAT	AOTCEREAL	AOILSEEDS	AVEGFR	AOTCRSDSV	ALVSTMIWO	AFISHFOR
UnskLab	7.61%	8.01%	8.56%	35.02%	26.36%	30.68%	57.99%
SkLab	0.21%	0.22%	0.24%	0.97%	1.67%	0.85%	1.61%
Capital	43.48%	43.28%	43.02%	30.19%	44.57%	32.30%	40.40%
Land	48.70%	48.48%	48.18%	33.81%	27.40%	36.17%	0.00%

Source: IFPRI SAM 2000 and GTAP 6 database

5.2. Results of the main simulation

Table 8: Domestic consumer prices (% change)[57]

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
CWHEAT	1.018	-29.758	-15.133	-29.752	-15.174
COTCEREAL	1.03	-20.558	-21.126	-20.754	-20.899
COILSEEDS	1.049	-28.289	-22.125	-28.208	-22.187
CVEGFR	1.015	-4.879	-9.845	-5.248	-10.215
COTCRSDSV	1.061	-6.697	-19.036	-5.816	-15.897
CLVSTMIWO	1.044	-15.995	-21.356	-12.616	-18.699
CFISHFOR	1.044	-4.736	-12.612	-3.957	-3.136
COIGAMIN	1.037	-32.852	4.77	-33.117	4.218
CMEAT	1.001	-6.408	-8.998	-6.937	-9.282
CELABVEGFR	1.015	-3.152	-6.266	-2.997	-6.191

[57] The base column shows nominal values. The columns of the different simulation runs show the percentage change relative to the base year.

CVEGOIL	1	-17.208	-0.097	-17.292	-0.641
CDAIRY	1.01	-3.98	-8.918	-4.087	-8.983
CCEREAMILL	1.019	-11.345	-10.118	-11.143	-9.964
COTPROCFD	1.019	-3.186	-5.776	-3.524	-6.503
CBEVTOB	1.028	-3.014	-6.016	-3.231	-6.365
CTXTWALEA	1.025	-2.014	-5.197	-2.353	-6.143
CWDPAPROD	1.036	-1.833	-4.622	-1.579	-4.363
CREFOIL	1.008	-4.538	-0.848	-5.435	-1.942
CCHEMPROD	1.028	-1.006	-4.26	-1.277	-5.236
CRPOTNMMP	1.039	-2.273	-3.81	-1.815	-3.468
CMEMPROD	1.028	-1.178	-4.57	-0.998	-4.621
CMAEQOTM	1.019	-0.7	-3.403	-0.568	-3.47
CELECTRI	1.043	-3.263	-4.015	-4.193	-5.05
CCONSTR	1.049	-3.877	-4.308	-4.699	-4.977
CGOBIERNO	1	-2.578	-4.549	-2.566	-4.756
CSERVICIOS	1.072	-2.522	-4.445	-2.452	-4.635

Table 9: Quantity of output (% change)

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
CWHEAT	2.069	-1.721	-35.513	-2.406	-36.401
COTCEREAL	2.087	-0.927	-4.166	-1.538	-7.489
COILSEEDS	5.243	-1.187	-34.687	-1.811	-35.202
CVEGFR	7.817	0.234	3.179	-0.121	2.115
COTCRSDSV	3.813	0.642	2.877	-0.799	-2.741
CLVSTMIWO	9.799	-0.418	1.221	-1.577	-1.014
CFISHFOR	1.667	1.876	29.836	-1.023	-2.667
COIGAMIN	9.249	-9.573	-38.132	-10.016	-39.762
CMEAT	17.724	-0.129	0.541	-0.567	-1.099
CELABVEGFR	1.845	0.524	3.383	-0.472	1.526
CVEGOIL	5.693	-9.036	-49.963	-9.556	-50.4
CDAIRY	7.158	0.844	3.252	0.028	1.343
CCEREAMILL	2.127	6.028	5.105	5.09	3.301
COTPROCFD	16.177	0.113	1.823	-0.449	0.568
CBEVTOB	9.125	-0.083	1.222	-0.863	-0.493
CTXTWALEA	18.662	0.201	2.161	-0.36	1.224
CWDPAPROD	13.596	0.949	3.495	-0.288	1.227
CREFOIL	7.819	4.496	-3.477	3.935	-6.259
CCHEMPROD	20.251	0.57	5.032	0.02	4.7
CRPOTNMMP	10.104	2.754	5.68	1.322	3.528

CMEMPROD	10.923	2.479	13.071	1.005	11.069
CMAEQOTM	24.243	2.263	14.3	0.892	12.752
CELECTRI	9.883	0.592	-0.432	-0.346	-3.065
CCONSTR	25.866	-0.574	-1.417	-1.769	-3.936
CGOBIERNO	27.591	-0.598	-1.059	-1.836	-3.392
CSERVICIOS	178.674	-0.043	0.063	-1.495	-2.505

Table 10: Quantity of domestically marketed output (% change)

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
CWHEAT	0.849	8.322	4.618	7.594	3.109
COTCEREAL	0.983	3.538	-1.716	2.241	-4.401
COILSEEDS	4.209	-2.797	-31.099	-3.299	-31.68
CVEGFR	7.343	1.386	3.163	0.952	1.995
COTCRSDSV	3.365	1.973	-4.303	0.916	-6.941
CLVSTMIWO	9.485	1.451	2.827	0.402	0.713
CFISHFOR	0.995	1.898	8.567	0.459	0.275
COIGAMIN	5.481	13.891	-7.034	12.91	-9.534
CMEAT	16.917	2.719	3.269	2.242	1.568
CELABVEGFR	1.675	1.115	2.675	0.171	0.865
CVEGOIL	1.61	11.245	-8.418	10.317	-10.05
CDAIRY	7.059	0.9	2.983	0.077	1.074
CCEREAMILL	1.952	3.165	2.888	2.358	1.197
COTPROCFD	14.709	0.731	1.453	0.046	-0.101
CBEVTOB	8.712	0.261	1.008	-0.558	-0.774
CTXTWALEA	18.41	0.075	1.792	-0.509	0.779
CWDPAPROD	13.074	0.612	2.546	-0.572	0.358
CREFOIL	6.698	1.246	-3.99	-0.024	-7.43
CCHEMPROD	18.751	0.187	3.171	-0.467	2.353
CRPOTNMMP	9.427	1.943	4.217	0.691	2.236
CMEMPROD	9.532	1.729	9.572	0.382	7.589
CMAEQOTM	20.151	1.432	9.484	0.229	7.901
CELECTRI	9.729	0.433	-0.629	-0.553	-3.312
CCONSTR	25.845	-0.581	-1.425	-1.777	-3.944
CGOBIERNO	27.591	-0.598	-1.059	-1.836	-3.392
CSERVICIOS	174.14	-0.178	-0.185	-1.625	-2.757

Table 11: Quantity of exports (% change)

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
CWHEAT	1.22	-8.827	-66.648	-9.482	-67.048
COTCEREAL	1.104	-4.938	-6.359	-4.929	-10.258
COILSEEDS	1.035	5.302	-49.754	4.19	-49.987
CVEGFR	0.474	-18.076	3.434	-17.139	3.964
COTCRSDSV	0.448	-9.512	53.517	-13.945	27.542
CLVSTMIWO	0.315	-62.982	-51.318	-68.651	-58.183
CFISHFOR	0.672	1.843	59.952	-3.229	-7.066
COIGAMIN	3.768	-46.661	-94.357	-46.19	-94.365
CMEAT	0.807	-67.194	-63.122	-66.601	-63.275
CELABVEGFR	0.17	-5.357	10.3	-6.871	7.992
CVEGOIL	4.083	-17.349	-68.812	-17.696	-68.654
CDAIRY	0.1	-3.142	21.877	-3.507	19.958
CCEREAMILL	0.175	36.733	29.056	34.429	26.067
COTPROCFD	1.469	-6.134	5.512	-5.443	7.2
CBEVTOB	0.413	-7.435	5.714	-7.367	5.398
CTXTWALEA	0.251	9.354	28.36	10.366	32.71
CWDPAPROD	0.523	9.289	26.609	6.766	22.425
CREFOIL	1.12	23.452	-0.425	26.902	0.669
CCHEMPROD	1.501	5.325	27.67	6.058	33.069
CRPOTNMMP	0.677	13.895	25.577	10.001	21.133
CMEMPROD	1.391	7.581	36.403	5.251	34.267
CMAEQOTM	4.092	6.334	37.353	4.143	35.958
CELECTRI	0.154	10.435	11.733	12.412	12.136
CCONSTR	0.022	7.177	7.177	7.629	5.839
CSERVICIOS	4.534	5.072	9.345	3.399	6.953

Table 12: Quantity of imports (% change)

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
CWHEAT	0.027	-82.501	-55.381	-82.611	-56.132
COTCEREAL	0.044	-68.879	-71.531	-69.657	-71.896
COILSEEDS	0.132	-80.523	-79.49	-80.517	-79.741
CVEGFR	0.197	-17.156	-32.064	-18.794	-33.932
COTCRSDSV	0.309	-24.125	-60.613	-21.862	-55.169
CLVSTMIWO	0.042	-49.069	-60.215	-41.097	-55.568
CFISHFOR	0.059	-18.269	-40.926	-16.396	-13.263
COIGAMIN	0.607	-81.511	16.434	-81.988	10.428

CMEAT	0.213	-21.108	-29.066	-23.225	-31.097
CELABVEGFR	0.137	-11.739	-21.911	-11.97	-23.031
CVEGOIL	0.115	-49.217	-8.792	-49.85	-12.457
CDAIRY	0.055	-14.122	-28.905	-15.198	-30.421
CCEREAMILL	0.046	-36.404	-32.983	-36.323	-33.632
COTPROCFD	0.473	-11.681	-20.301	-13.516	-23.939
CBEVTOB	0.123	-11.274	-21.149	-12.782	-23.679
CTXTWALEA	1.149	-8.417	-19.276	-10.312	-23.47
CWDPAPROD	1.259	-7.375	-16.944	-7.406	-17.732
CREFOIL	0.317	-16.965	-7.427	-21.236	-14.877
CCHEMPROD	3.995	-4.699	-16.627	-6.59	-21.273
CRPOTNMMP	1.756	-8.755	-13.51	-7.83	-13.713
CMEMPROD	1.498	-3.804	-11.981	-4.261	-13.789
CMAEQOTM	13.196	-3.245	-12.731	-3.538	-14.366
CELECTRI	0.22	-8.664	-11.622	-12.022	-16.633
CSERVICIOS	8.782	-5.166	-8.884	-6.404	-11.586

Table 13: Quantity of domestic goods supply (% change)[58]

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
CWHEAT	0.876	5.143	2.636	4.436	1.152
COTCEREAL	1.027	0.11	-5.028	-1.165	-7.6
COILSEEDS	4.341	-5.485	-32.732	-5.968	-33.302
CVEGFR	7.54	0.891	2.199	0.423	1.01
COTCRSDSV	3.674	-0.296	-9.491	-1.056	-11.321
CLVSTMIWO	9.527	1.21	2.518	0.207	0.441
CFISHFOR	1.054	0.741	5.619	-0.504	-0.495
COIGAMIN	6.088	2.896	-4.75	1.962	-7.586
CMEAT	17.13	2.413	2.848	1.914	1.141
CELABVEGFR	1.812	0.131	0.764	-0.758	-0.992
CVEGOIL	1.725	6.866	-8.443	5.957	-10.211
CDAIRY	7.114	0.782	2.726	-0.043	0.82
CCEREAMILL	1.997	2.207	2.025	1.422	0.359
COTPROCFD	15.182	0.338	0.755	-0.384	-0.868
CBEVTOB	8.835	0.098	0.69	-0.731	-1.104
CTXTWALEA	19.559	-0.429	0.523	-1.091	-0.689
CWDPAPROD	14.333	-0.096	0.794	-1.177	-1.266
CREFOIL	7.015	0.404	-4.146	-1.009	-7.77

[58] The domestic goods supply consists of imported and domestically produces goods.

CCHEMPROD	22.745	-0.675	-0.38	-1.549	-1.904
CRPOTNMMP	11.182	0.244	1.381	-0.659	-0.312
CMEMPROD	11.03	0.973	6.578	-0.251	4.618
CMAEQOTM	33.348	-0.425	0.547	-1.266	-1.06
CELECTRI	9.949	0.228	-0.877	-0.812	-3.615
CCONSTR	25.845	-0.581	-1.425	-1.777	-3.944
CGOBIERNO	27.591	-0.598	-1.059	-1.836	-3.392
CSERVICIOS	182.922	-0.42	-0.612	-1.857	-3.191

Table 14: Demand for unskilled agricultural labor (% change)[59]

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
AWHEAT	24.204	-12.902	-37.371	-17.248	-42.127
AOTCEREAL	23.546	-7.16	-6.954	-11.779	-15.807
AOILSEEDS	70.461	-10.017	-36.518	-14.397	-40.976
AVEGFR	196.08	3.326	6.983	-1.516	-0.654
AOTCRSDSV	272.779	2.678	2.435	-2.783	-7.952
ALVSTMIWO	316.291	-1.304	-0.164	-5.182	-7.1
AFISHFOR	50.339	4.298	32.971	-2.102	-3.445

Table 15: Demand for unskilled non-agricultural labor (% change)

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
AOIGAMIN	35.52	-21.188	-38.21	-22.008	-40.431
AMEAT	69.82	-1.657	-0.382	-7.576	-8.558
AELABVEGFR	35.73	1.01	2.827	-1.829	-3.497
AVEGOIL	6.88	-37.111	-50.366	-39.434	-53.772
ADAIRY	25.45	5.322	2.383	-0.404	-5.734
ACEREAMILL	12.35	12.3	4.537	9.375	-1.825
AOTPROCFD	195.09	0.587	0.984	-3.173	-6.365
ABEVTOB	61.57	-0.38	0.436	-4.297	-6.996
ATXTWALEA	248.08	1.23	1.194	-2.847	-6.696
AWDPAPROD	169.67	2.135	2.812	-1.444	-4.667
AREFOIL	7.63	40.954	-4.431	34.076	-13.915
ACHEMPROD	65.54	3.035	4.058	-0.983	-3.444
ARPOTNMMP	172.72	4.143	5.217	1.045	-0.953
AMEMPROD	117.56	5.633	12.332	1.543	4.694
AMAEQOTM	297.08	4.988	13.552	0.944	6.112

[59] The base column shows the quantity of unskilled workers demanded by activity in the base year.

AELECTRI	32.85	2.535	-1.316	-2.768	-10.406
ACONSTR	818.08	-2.847	-2.408	-9.267	-11.96
AGOBIERNO	358.59	-0.874	-1.516	-4.866	-9.089
ASERVICIOS	5431.80	-0.142	-0.65	-4.564	-9.082

Table 16: Demand for skilled labor (% change)

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
AWHEAT	0.672	-16.125	-40.525	-16.577	-41.202
AOTCEREAL	0.653	-10.596	-11.641	-11.064	-14.462
AOILSEEDS	1.955	-13.348	-39.715	-13.702	-40.033
AVEGFR	5.441	-0.498	1.595	-0.717	0.933
AOTCRSDSV	14.357	-1.122	-2.724	-1.994	-6.481
ALVSTMIWO	8.777	-4.957	-5.193	-4.412	-5.616
AFISHFOR	1.397	1.059	27.346	-1.438	-2.156
AOIGAMIN	9.832	-21.17	-38.169	-21.479	-39.636
AMEAT	11.272	-1.53	-0.007	-4.01	-1.51
AELABVEGFR	8.989	1.141	3.215	1.959	3.942
AVEGOIL	1.732	-37.029	-50.179	-37.097	-50.209
ADAIRY	3.769	5.458	2.769	3.439	1.533
ACEREAMILL	3.107	12.445	4.931	13.596	5.742
AOTPROCFD	49.078	0.717	1.365	0.564	0.853
ABEVTOB	12.432	-0.251	0.815	-0.604	0.173
ATXTWALEA	42.526	1.377	1.624	1.38	1.434
AWDPAPROD	38.108	2.284	3.249	2.844	3.639
AREFOIL	1.836	41.159	-4.026	39.91	-6.415
ACHEMPROD	22.196	3.185	4.5	3.326	4.969
ARPOTNMMP	47.86	4.294	5.663	5.442	7.677
AMEMPROD	24.078	5.786	12.809	5.961	13.816
AMAEQOTM	72.034	5.141	14.034	5.337	15.357
AELECTRI	14.147	2.684	-0.897	1.463	-2.6
ACONSTR	159.315	-2.691	-1.948	-4.87	-3.397
AGOBIERNO	529.012	-0.73	-1.098	-0.727	-1.168
ASERVICIOS	2820.214	0.022	-0.174	0.136	-0.093

Table 17: Demand for capital (% change)

	BASE	ETAX07LR	**ETAX07LRUE**
AWHEAT	0.524	-40.446	-41.079
AOTCEREAL	0.476	-11.524	-14.283

AOILSEEDS	1.4	-39.635	-39.908
AVEGFR	5.905	1.729	1.145
AOTCRSDSV	1.142	-2.595	-6.285
ALVSTMIWO	2.179	-5.068	-5.418
AFISHFOR	0.444	27.487	-1.985
AOIGAMIN	4.372	-38.1	-39.53
AMEAT	8.46	0.615	-0.539
AELABVEGFR	0.218	3.856	4.967
AVEGOIL	0.759	-49.869	-49.718
ADAIRY	2.688	3.408	2.534
ACEREAMILL	0.222	5.584	6.785
AOTPROCFD	7.943	1.996	1.848
ABEVTOB	3.48	1.442	1.161
ATXTWALEA	9.42	2.335	2.56
AWDPAPROD	3.343	3.971	4.79
AREFOIL	2.799	-3.354	-5.376
ACHEMPROD	10.776	5.231	6.134
ARPOTNMMP	1.688	6.402	8.872
AMEMPROD	2.692	13.598	15.079
AMAEQOTM	6.25	14.832	16.637
AELECTRI	4.699	-0.204	-1.519
ACONSTR	10.898	-1.185	-2.204
AGOBIERNO	5.224	-0.406	-0.071
ASERVICIOS	56.159	0.615	1.16

Table 18: Demand for land (% change)

	BASE	ETAX07LR	**ETAX07LRUE**
AWHEAT	0.547	-27.782	-27.65
AOTCEREAL	0.503	7.291	5.253
AOILSEEDS	1.415	-26.798	-26.212
AVEGFR	0.499	23.362	24.197
AOTCRSDSV	0.665	18.118	15.073
ALVSTMIWO	1.703	15.12	16.138

Table 19: Factor supply in the economy (% change)

	BASE	**ETAX07SRUE**	**ETAX07LRUE**
UnskLaAgr	953.701	-4.729	-9.432
UnskLaNAgr	8161.999	-4.502	-8.291

SkLab	3904.788		
Capital	154.16		
Land	5.333		

Table 20: Economy wide wage (rent) for factor f (% change)

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
UnskLaAgr	0.004	-16.621	-23.045		
UnskLaNAgr	0.008	-2.264	-4.155		
SkLab	0.009	-2.376	-4.477	-3.324	-6.415
Capital	1		-5.004		-7.231
Land	1		-57.587		-60.691

Table 21: Sector-specific capital rent (% change)

	BASE	ETAX07SR	**ETAX07SRUE**
AWHEAT	1	-53.209	-54.697
AOTCEREAL	1	-38.889	-40.795
AOILSEEDS	1	-46.378	-47.802
AVEGFR	1	-4.392	-6.189
AOTCRSDSV	1	-6.878	-11.133
ALVSTMIWO	1	-21.074	-19.951
AFISHFOR	1	2.905	-10.076
AOIGAMIN	1	-70.283	-71.143
AMEAT	1	-3.711	-6.793
AELABVEGFR	1	-1.383	-1.635
AVEGOIL	1	-35.403	-36.091
ADAIRY	1	2.368	-0.361
ACEREAMILL	1	8.402	8.33
AOTPROCFD	1	-1.752	-2.838
ABEVTOB	1	-2.595	-3.846
ATXTWALEA	1	-1.311	-2.267
AWDPAPROD	1	-0.611	-1.148
AREFOIL	1	28.343	26.203
ACHEMPROD	1	0.084	-0.781
ARPOTNMMP	1	0.936	0.828
AMEMPROD	1	2.081	1.222
AMAEQOTM	1	1.586	0.749
AELECTRI	1	-0.302	-2.203
ACONSTR	1	-4.26	-6.711

AGOBIERNO	1	-2.942	-3.882
ASERVICIOS	1	-2.361	-3.232

Table 22: Sector-specific land rent (% change)

	BASE	ETAX07SR	**ETAX07SRUE**
AWHEAT	1	-53.209	-54.697
AOTCEREAL	1	-38.889	-40.795
AOILSEEDS	1	-46.378	-47.802
AVEGFR	1	-4.392	-6.189
AOTCRSDSV	1	-6.878	-11.133
ALVSTMIWO	1	-21.074	-19.951

Table 23: Household income (% change)

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
RurUnskHH	4.459	-14.031	-18.673	-4.672	-8.86
UrbUnskHH	82.953	-2.226	-4.364	-3.826	-7.467
SkilledHH	35.118	-2.348	-4.583	-3.258	-6.492
CapHH	139.746	-4.62	-6.513	-5.932	-8.787

Table 24: Household consumption expenditure (% change)

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
RurUnskHH	4.014	-13.581	-18.514	-4.236	-8.792
UrbUnskHH	74.614	-1.932	-4.177	-3.537	-7.399
SkilledHH	30.503	-1.833	-4.395	-2.813	-6.426
CapHH	107.421	-4.049	-6.309	-5.441	-8.688

Table 25: Household specific consumption price index (% change)

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
RurUnskHH	1.047	-3.53%	-5.35%	-3.53%	-5.64%
UrbUnskHH	1.049	-3.15%	-5.24%	-3.24%	-5.62%
SkilledHH	1.053	-2.94%	-5.03%	-3.04%	-5.32%
CapHH	1.058	-2.74%	-4.73%	-2.74%	-5.01%

Table 26: Real household consumption (% change)

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
RurUnskHH	4	-10	-13.3	-0.2	-2.8
UrbUnskHH	74.6	1.6	1.6		-1.5
SkilledHH	30.5	1.4	1	0.4	-0.8
CapHH	107.4	-1.3	-1.4	-2.6	-3.6
TOTAL	216.6	-0.1	-0.3	-1.2	-2.5

Table 27: Household welfare

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
RurUnskHH	4	-10.1	-13.4	-0.3	-2.8
UrbUnskHH	74.6	1.5	1.6		-1.5
SkilledHH	30.5	1.3	1	0.4	-0.8
CapHH	107.4	-1.3	-1.4	-2.6	-3.6
TOTAL	216.6	-0.1	-0.3	-1.3	-2.5

In the BASE column, consumption value at base-year prices.

The non-BASE columns show EV as % of BASE consumption value

Table 28: Macro statistics

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
QABSTOT	291.1	-0.2	-0.5	-1.4	-2.8
QHTOT	216.6	-0.1	-0.3	-1.2	-2.5
QINVTOT	51.4	-0.6	-1.2	-1.9	-3.8
QGTOT	23.1	-0.6	-1	-1.9	-3.3
QETOT	30.5	-7.8	-14.1	-8.6	-16.6
QMTOT	32.8	-7.2	-13.1	-8	-15.4
REXR	100	4.2	6.1	4.2	6.3
NEXR	100				
PWEIND	100				
PWMIND	100				
PWIND	100				
PDIND	100	-4	-5.7	-4	-6
CPI	100	-3	-5.2	-3.1	-5.5
TOFT	100				
INVGDP	17.3	-0.2		-0.2	-0.1
PRVSAVGDP	13.9	-0.9	-0.4	-0.8	-0.5
FORSAVGDP	4.2	0.1	0.2	0.2	0.4

TRDDEFGDP	1.4	1	0.5	1	0.5
GOVSAVGDP	1.9	0.7	0.1	0.6	0.2
IMPTAXGDP	0.7		-0.1		-0.1
EXPTAXGDP		1	0.5	1	0.5
DIRTAXGDP	9.8	-0.1	-0.1	-0.1	0.2

In the BASE column: Aggregate real indicators are measured at base-year values. Exchange rates and price indices are set at 100. Items with GDP in name are expressed as % of nominal GDP.

Units for non-BASE columns: % changes from BASE for items not computed as GDP shares. Deviation from BASE for items computed as GDP shares.

Table 29: GDP and national accounts (in real terms; % change)[60]

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
ABSORP	299.058	-0.22	-0.488	-1.363	-2.692
PRVCON	216.552	-0.084	-0.27	-1.24	-2.464
FIXINV	51.369	-0.644	-1.239	-1.861	-3.785
DSTOCK	8				
GOVCON	23.137	-0.623	-1.029	-1.875	-3.33
EXPORTS	30.516	-7.792	-14.12	-8.635	-16.615
IMPORTS	-32.821	-7.245	-13.129	-8.028	-15.448
GDPMP	296.753	-0.222	-0.491	-1.373	-2.713
NETITAX	32.242	-0.633	-1.14	-1.858	-3.494
GDPFC2	264.511	-0.033	-0.082	-1.177	-2.297

Table 30: Real GDP at factor costs by activity (% change)

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
AWHEAT	1.188	-1.721	-35.513	-2.406	-36.401
AOTCEREAL	1.093	-0.927	-4.166	-1.538	-7.489
AOILSEEDS	3.107	-1.187	-34.687	-1.811	-35.202
AVEGFR	6.958	0.234	3.179	-0.121	2.115
AOTCRSDSV	2.516	0.642	2.877	-0.799	-2.741
ALVSTMIWO	5.414	-0.418	1.221	-1.577	-1.014
AFISHFOR	0.859	1.876	29.836	-1.023	-2.667
AOIGAMIN	6.349	-9.573	-38.132	-10.016	-39.762
AMEAT	9.179	-0.129	0.541	-0.567	-1.099
AELABVEGFR	0.439	0.524	3.383	-0.472	1.526

[60] The variable ABSORP in Table 29 includes the total inventory (DSTOCK), whereas the variable QABSTOT in Table 28 does not include it.

AVEGOIL	0.959	-9.036	-49.963	-9.556	-50.4
ADAIRY	3.204	0.844	3.252	0.028	1.343
ACEREAMILL	0.445	6.028	5.105	5.09	3.301
AOTPROCFD	9.742	0.113	1.823	-0.449	0.568
ABEVTOB	4.541	-0.083	1.222	-0.863	-0.493
ATXTWALEA	11.232	0.201	2.161	-0.36	1.224
AWDPAPROD	5.98	0.949	3.495	-0.288	1.227
AREFOIL	3.196	4.496	-3.477	3.935	-6.259
ACHEMPROD	13.261	0.57	5.032	0.02	4.7
ARPOTNMMP	5.012	2.754	5.68	1.322	3.528
AMEMPROD	4.837	2.479	13.071	1.005	11.069
AMAEQOTM	11.473	2.263	14.3	0.892	12.752
AELECTRI	6.111	0.592	-0.432	-0.346	-3.065
ACONSTR	13.654	-0.574	-1.417	-1.769	-3.936
AGOBIERNO	21.53	-0.598	-1.059	-1.836	-3.392
ASERVICIOS	112.231	-0.043	0.063	-1.495	-2.505
TOTAL	264.511	-0.033	-0.082	-1.177	-2.297

5.3. Results of the simulation with integrated labor market for unskilled labor

Table 31: Macro Statistics[61]

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
QABSTOT	291	-0.2	-0.4	-1.4	-2.8
QHTOT	216.4		-0.2	-1.2	-2.5
QINVTOT	51.4	-0.6	-1	-1.8	-3.8
QGTOT	23.2	-0.4	-0.7	-1.9	-3.3
QETOT	30.5	-7.9	-15	-8.6	-16.6
QMTOT	32.8	-7.4	-14	-8	-15.4
REXR	100	4.2	6.3	4.2	6.3
NEXR	100				
PWEIND	100				
PWMIND	100				
PWIND	100				
PDIND	100	-4	-5.9	-4	-6
CPI	100	-3.1	-5.4	-3.1	-5.5

[61] For explanations see notes below table 28. We will not repeat notes below the tables of the robustness simulations.

TOFT	100				
INVGDP	17.3	-0.2		-0.2	-0.1
PRVSAVGDP	13.9	-0.9	-0.4	-0.8	-0.5
FORSAVGDP	4.2	0.1	0.3	0.2	0.4
TRDDEFGDP	1.4	1	0.4	1	0.5
GOVSAVGDP	1.9	0.7	0.1	0.6	0.2
IMPTAXGDP	0.7		-0.1		-0.1
EXPTAXGDP		1	0.5	1	0.5
DIRTAXGDP	9.8	-0.1		-0.1	0.2

Table 32: GDP and national accounts (in real terms; % change)

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
ABSORP	298.996	-0.16	-0.387	-1.352	-2.688
PRVCON	216.447	-0.04	-0.218	-1.231	-2.459
FIXINV	51.386	-0.561	-1.004	-1.84	-3.781
DSTOCK	8.004				
GOVCON	23.159	-0.443	-0.734	-1.862	-3.327
EXPORTS	30.54	-7.919	-15.032	-8.587	-16.596
IMPORTS	-32.832	-7.366	-13.983	-7.988	-15.438
GDPMP	296.704	-0.161	-0.39	-1.362	-2.709
NETITAX	32.236	-0.561	-1.051	-1.845	-3.492
GDPFC2	264.467	0.029	0.028	-1.167	-2.292

Table 33: Factor supply in the economy (% change)

	BASE	**ETAX07SRUE**	**ETAX07LRUE**
UnskLab	9115.7	-4.489	-8.403
SkLab	3904.788		
Capital	154.198		
Land	5.337		

Table 34: Economy wide wage (rent) for factor f (% change)

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
UnskLab	0.008	-2.655	-4.997		
SkLab	0.009	-2.457	-4.761	-3.294	-6.409
Capital	1		-5.333		-7.225
Land	1		-59.89		-60.755

Table 35: Household Welfare (% change)

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
UnskHH	78.5	1.3	1.3		-1.6
SkilledHH	30.5	1.3	0.9	0.4	-0.8
CapHH	107.4	-1.5	-1.7	-2.6	-3.6
TOTAL	216.4	-0.1	-0.2	-1.3	-2.5

Table 36: Real GDP at factor costs by activity (% change)

	BASE	ETAX07SR	ETAX07LR	**ETAX07SRUE**	**ETAX07LRUE**
AWHEAT	1.184	-2.25	-36.707	-2.349	-36.688
AOTCEREAL	1.089	-1.412	-8.682	-1.501	-7.249
AOILSEEDS	3.099	-1.666	-35.683	-1.766	-35.316
AVEGFR	6.95	-0.046	2.441	-0.117	2.138
AOTCRSDSV	2.502	-0.509	-1.857	-0.778	-2.664
ALVSTMIWO	5.382	-1.175	0.377	-1.556	-0.981
AFISHFOR	0.849	-0.472	2.306	-0.999	-2.537
AOIGAMIN	6.347	-9.508	-37.84	-10.045	-39.802
AMEAT	9.183	-0.252	0.087	-0.558	-1.066
AELABVEGFR	0.438	0.529	3.258	-0.47	1.55
AVEGOIL	0.958	-9.133	-50.724	-9.526	-50.486
ADAIRY	3.204	0.655	2.91	0.043	1.369
ACEREAMILL	0.444	6.174	4.977	5.121	3.338
AOTPROCFD	9.743	0.185	1.883	-0.444	0.581
ABEVTOB	4.54	-0.014	1.248	-0.856	-0.481
ATXTWALEA	11.234	0.256	2.276	-0.356	1.229
AWDPAPROD	5.979	1.098	3.642	-0.281	1.232
AREFOIL	3.194	4.563	-3.346	3.949	-6.268
ACHEMPROD	13.262	0.657	5.617	0.021	4.695
ARPOTNMMP	5.011	3.021	6.468	1.324	3.533
AMEMPROD	4.835	2.783	14.912	1.004	11.077
AMAEQOTM	11.472	2.551	16.113	0.887	12.742
AELECTRI	6.11	0.727	0.016	-0.336	-3.062
ACONSTR	13.652	-0.49	-1.205	-1.751	-3.932
AGOBIERNO	21.537	-0.434	-0.799	-1.822	-3.388
ASERVICIOS	112.27	0.097	0.344	-1.482	-2.503
TOTAL	264.467	0.029	0.028	-1.167	-2.292

5.4. Results of the simulation with unemployment of all labor types

Table 37: Macro statistics

	BASE	ETAX07SRUE	ETAX07LRUE
QABSTOT	291.1	-2.1	-4.3
QHTOT	216.6	-1.9	-3.8
QINVTOT	51.4	-2.4	-5.3
QGTOT	23.1	-3.7	-6.6
QETOT	30.5	-9	-17.4
QMTOT	32.8	-8.3	-16.2
REXR	100	4.1	6
NEXR	100		
PWEIND	100		
PWMIND	100		
PWIND	100		
PDIND	100	-3.9	-5.7
CPI	100	-3	-5.4
TOFT	100		
INVGDP	17.3	-0.3	-0.1
PRVSAVGDP	13.9	-0.8	-0.6
FORSAVGDP	4.2	0.2	0.4
TRDDEFGDP	1.4	1.1	0.5
GOVSAVGDP	1.9	0.6	0.2
IMPTAXGDP	0.7		-0.1
EXPTAXGDP		1	0.5
DIRTAXGDP	9.8	-0.1	0.4

Table 38: GDP and national accounts (in real terms; %change)

	BASE	ETAX07SRUE	ETAX07LRUE
ABSORP	299.058	-2.088	-4.16
PRVCON	216.552	-1.908	-3.776
FIXINV	51.369	-2.444	-5.315
DSTOCK	8		
GOVCON	23.137	-3.703	-6.624
EXPORTS	30.516	-8.963	-17.408
IMPORTS	-32.821	-8.333	-16.186
GDPMP	296.753	-2.104	-4.192
NETITAX	32.242	-2.592	-4.968

GDPFC2	264.511	-1.91	-3.786

Table 39: Factor supply in the economy (% change)

	BASE	ETAX07SRUE	ETAX07LRUE
UnskLaAgr	953.701	-4.891	-9.737
UnskLaNAgr	8161.999	-5.05	-9.357
SkLab	3904.788	-4.886	-9.53
Capital	154.16		
Land	5.333		

Table 40: Economy wide wage (rent) of factor f (% change)

	BASE	ETAX07LRUE
UnskLaAgr	0.004	
UnskLaNAgr	0.008	
SkLab	0.009	
Capital	1	-8.157
Land	1	-60.978

Table 41: Household welfare (% change)

	BASE	ETAX07SRUE	ETAX07LRUE
RurUnskHH	4	-0.4	-3.1
UrbUnskHH	74.6	-0.4	-2.4
SkilledHH	30.5	-1	-3.8
CapHH	107.4	-3.3	-4.8
TOTAL	216.6	-1.9	-3.8

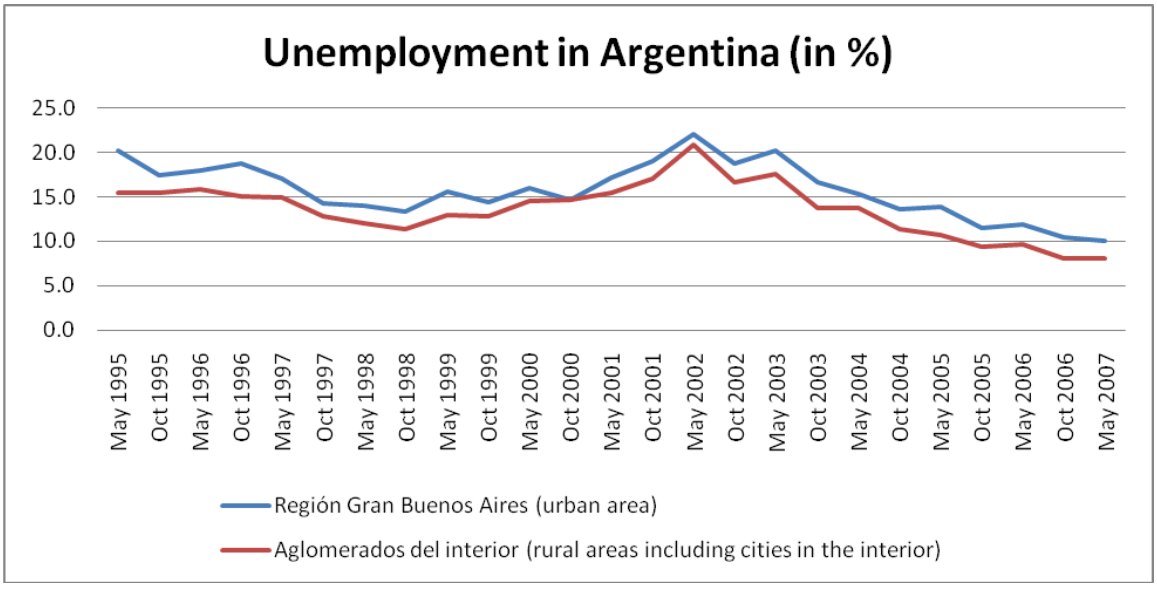
Table 42: Real GDP at factor costs by activity (% change)

	BASE	ETAX07SRUE	ETAX07LRUE
AWHEAT	1.188	-2.428	-36.358
AOTCEREAL	1.093	-1.559	-6.484
AOILSEEDS	3.107	-1.828	-34.989
AVEGFR	6.958	-0.134	2.077
AOTCRSDSV	2.516	-0.852	-2.767
ALVSTMIWO	5.414	-1.68	-1.538
AFISHFOR	0.859	-1.115	-3.407

AOIGAMIN	6.349	-10.269	-40.912
AMEAT	9.179	-0.66	-1.535
AELABVEGFR	0.439	-0.969	0.62
AVEGOIL	0.959	-9.771	-50.316
ADAIRY	3.204	-0.186	0.646
ACEREAMILL	0.445	4.613	2.518
AOTPROCFD	9.742	-0.697	0.009
ABEVTOB	4.541	-1.199	-1.336
ATXTWALEA	11.232	-0.559	0.785
AWDPAPROD	5.98	-0.907	-0.048
AREFOIL	3.196	3.655	-8.003
ACHEMPROD	13.261	-0.298	4.045
ARPOTNMMP	5.012	0.554	2.028
AMEMPROD	4.837	0.341	9.326
AMAEQOTM	11.473	0.135	11.016
AELECTRI	6.111	-0.917	-4.821
ACONSTR	13.654	-2.365	-5.467
AGOBIERNO	21.53	-3.474	-6.397
ASERVICIOS	112.231	-2.488	-4.369
TOTAL	264.511	-1.91	-3.786

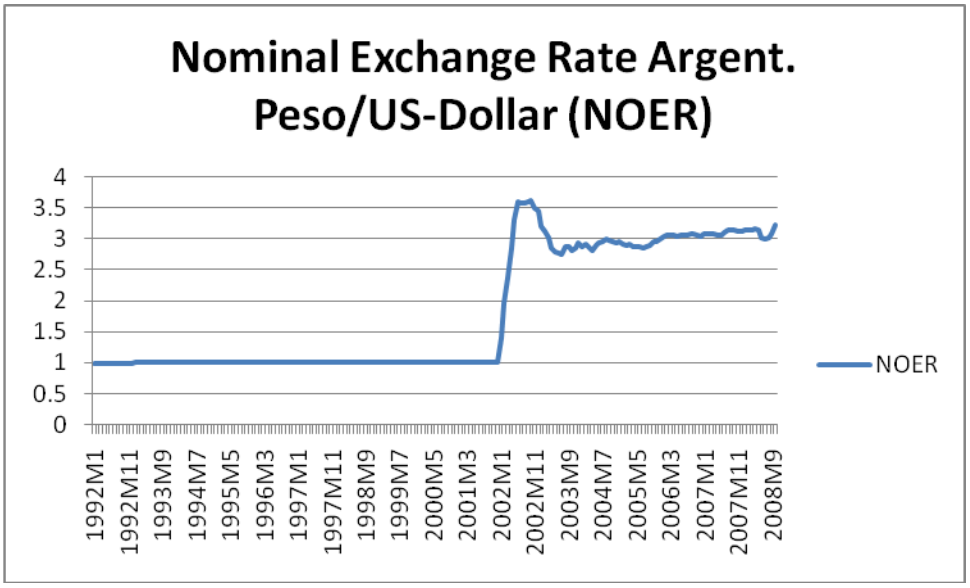
5.5. Graphs

Graph 1: Unemployment in Argentina



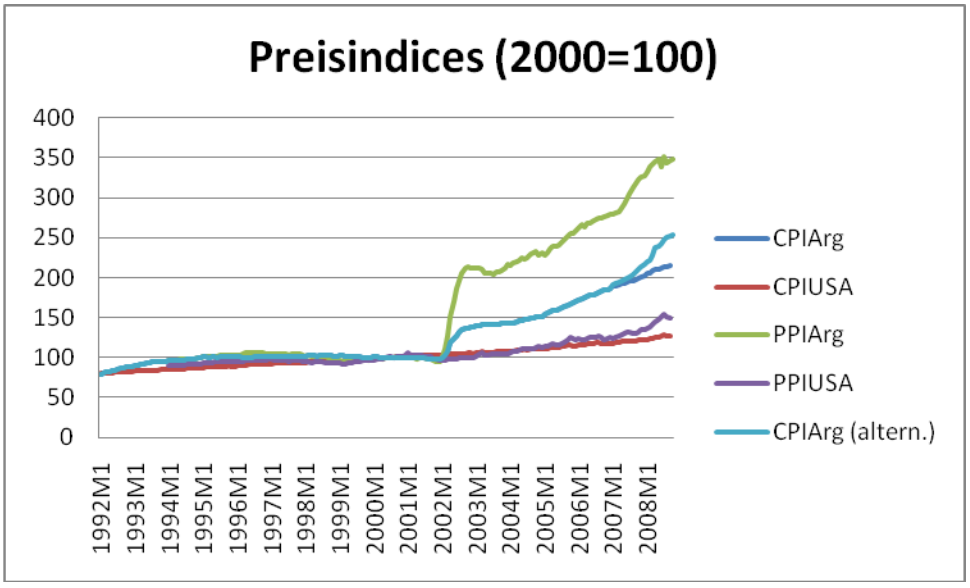
Source: Encuesta Permanente de Hogares (EPH) (INDEC)

Graph 2: Nominal Exchange Rate



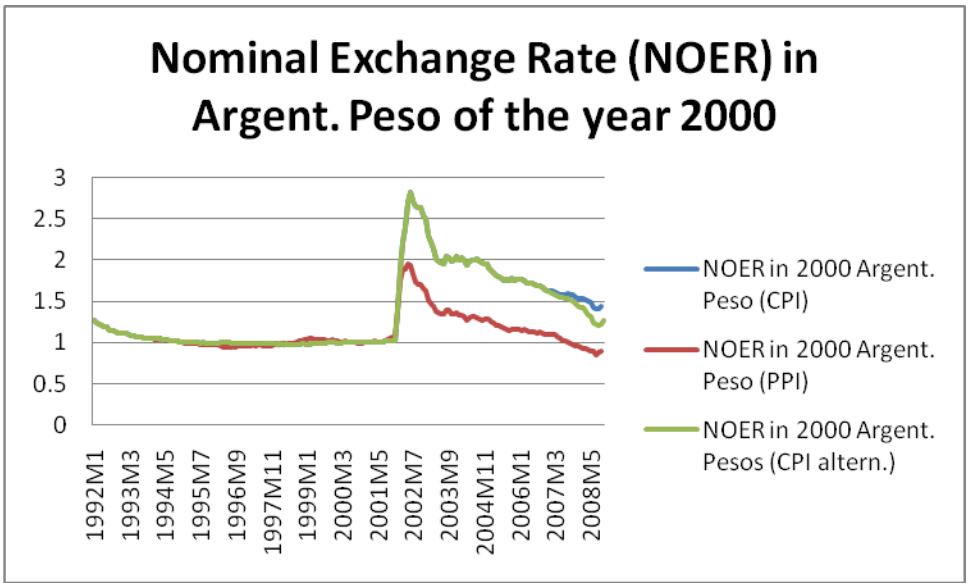
Source: IMF International Financial Statistics

Graph 3: Consumer (CPI) and Producer (PPI) Price Indices

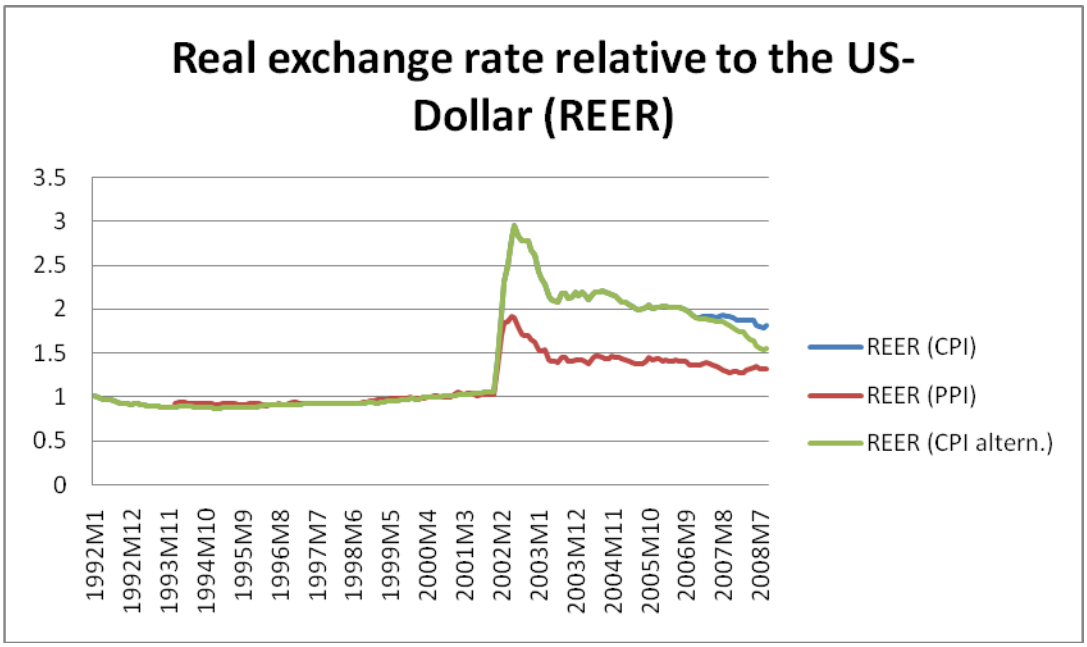


Source: IMF International Financial Statistics (except alternative CPIArg, which we obtained from the private Argentinean research institute FIEL)

Graph 4: Nominal Exchange Rate relative to the US-Dollar (in Argentinean Peso of the year 2000)



Graph 5: Real Exchange Rate relative to the US-Dollar



6. References

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