**The 2004 European Union Enlargement and its impacts on Brazilian agribusiness**

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***Abstract:*** *International trade has acquired increasing importance for the Brazilian economy, especially for agribusiness. In this way, understanding other countries policies that affects international trade and its impacts in this country is equally important. The European Union (EU) is one of the most important Brazilian trade partners and it is known by its strong interference on its agricultural sector. The recent European enlargement and the last Common Agricultural Policy (CAP) Reform have been studied at different regions of the World but there is a lack of knowledge regarding the impacts of this on Brazilian rural sectors. This paper aims at assessing the impacts of the 2004 EU enlargement on Brazilian agribusiness using the General Equilibrium Model Global Trade Analysis Project (GTAP) under three alternatives scenarios for CAP Reform. The sectoral impacts were more relevant within the EU, as expected, as the measures take place in this region. The aggregate impact of the enlargement with or without decoupling was not important for the Brazilian economy. But it was found that the different EU agricultural policies affect the different Brazilian agribusiness sectors performance as oilseeds*

*and bovine meat. Exports from these Brazilian sectors grow with enlargement as decoupling takes place, though they decrease under enlargement without decoupling.*

***Key words:*** *International economics; International trade; General equilibrium; Economic integration.*

***JEL Classification:*** *F11, F15, Q17.*

## 1. Introduction

The last European Union (EU) enlargement takes place in 2004 and it is the biggest one that has ever occurred, if the number of nations involved is taken in account. Ten new countries join the community that becomes one of the most important and largest economic blocks in the World. This integration extends UE agricultural, trade and external policies to the new members. The Common Agricultural Policy (CAP) stands out and it is one of the main mechanisms of agricultural intervention that exists in the Globe.

The EU appearing goes back to pre Second World War period. The Prime Minister of France, Robert Schuman, proposes to create an association among countries to pool steel and coal production in Europe in 1950. Representatives of France, West Germany, Italy, Netherlands, Belgium and Luxemburg sign the Treaty of Paris that establishes the European Coal and Steel Community (ECSC) and enters into force in 1952. As a consequence of the ECSC success, these six countries decide to deepen its association. The Treaties of Rome are signed and the European Economic Community (EEC) as the European Atomic Energy Community (Euratom) are established in 1958. The initial goals for the EEC is to remove trade barriers among its members

and to establish a commom market. The Euratom, as the name invokes, deals with pooling the Member States' nuclear industries. These three communities are merged in only one in 1967, The European Community (EC). After institucional and structural changes, the EC is converted on the European Union (EU) in 1992. The first EC enlargement takes place in 1973, when United Kingdom, Denmark and Ireland accedes to the EC. The fifth EC/ EU enlargement occurs in 2004 and comprises the largest number of countries ever admitted at one time: Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia accede to the EU. The institutional and political framework from EU is transferred to the new members, including the Common Agriculture Policy (CAP). (CRONOLOGY..., 2005; HISTORY..., 2005; THE CHURCHILL SOCIETY, LONDON, 2005).

The CAP is sketched after the Treaties of Rome and takes place in 1962 when the founding members of the EU had just emerged from over a decade of severe food shortages during and after the Second World War. In this context, the CAP initials objectives are increase agricultural production and productivity , stabilize markets and to secure availability of supplies. That is done through the establishment of trade barriers to agricultural products imports and the set of subsidies for agricultural production within the EU. Since the 1970s the agricultural production of the EU not only supplies the internal market but starts to generate exportable surplus. Subsidies to exports are settled to enable this excess to reach external markets. This fact stimulates more production and overflows the international market. The invasion of the EU agricultural surplus in the World market causes reaction in many countries, including the agricultural exporter ones, as Brazil. Besides that, the negotiations between the World Trade Organization (WTO) and the EU and the increasing cost of financing the rural sector demands some restriction on the CAP that starts on the 1990s. Reforms in the CAP have been implemented since then, in order to diminish the official interference on agriculture. Intervention

prices starts to lower, production quotas and compulsory set-aside areas are established, as well the direct payments. These latter are compensatory payments created to compensate the partial removal of direct support on price, one of the initial principles of CAP.

The last PAC reform, The 2003 Medium Term Review, implants the decoupling of the direct payments. This is a measure to detach the farm income and subsidy from the amount produced. The decoupling aims to substitute all direct payments for an unique payment, related to the history of payments received by the farm. It has not been easy its implementation, there are many exceptions for decoupling and there have been resistance among rural producers due to the measure.

The 2003 Medium Term Review stresses alternative functions of agriculture as food security, environment protection and viability of rural areas, the known multifunctionality of agriculture inside the EU. Besides that, this reform seeks to transfer funds from production subsidies to rural development, environment protection and other, the called modulation (BLANTON, 2005; EUROPEAN UNION, 2003; OECD, 2004; OXFAM, 2002; RAO, 2005).

Gabrish (1997) studied the consequences of the last Enlargement and foresees prices and wages adjustments e funds transfers from the old to the new EU members. But this author points out that a fast economic growth probably will not be seen in these new members. The same fact happened when Greece, Spain and Portugal joined to the EU. Dyker (2001) agrees with him in a short run. But in the long run he foresees stronger growing as investment and scale gains takes place in the region. He does not expects great aggregate impacts in the whole EU as the enlargement involves countries with reduced economic weight if compared with the old members. Keuschnigg, Keuschnigg e Kohler (2001) studied the impacts of this Enlargement on Germany economy and concluded that new opportunities for investment and economic growth

are foreseen for that country with no massive immigration of populations from the east of the continent.

Bchir, Fontagné and Zanghieri (2003) assessed the impacts of the Enlargement in the EU using a general equilibrium model which deals with market imperfect competition, the MIRAGE. It was found that the economic benefits are concentrated on the new members, as they will be associated to a huge already integrated region. Increasing capital flux and market expansion explains this performance of the new members. Paas and Tafenau (2005) found that this last Enlargement has the potential of increase trade flux and technology transfer within the region.

Impacts of the Enlargement has been assessed using the Global Trade Analysis Project (GTAP) model (Jensen and Frandsen, 2003; Herok and Lotze, 2000; Antimiani and Santuccio, 2004). This applied general equilibrium model was developed to assess the impact of trade fluxes on different regions of the World, generating globally consistent results (Hertel, 1997). But the studies about the Enlargement almost never focuses on Brazil, a new important player in international agricultural markets.

Cochrane and Seeley (2004) studied the impacts of the last Enlargement on agriculture production and found that beef meat and grains production might increase in the new Member States. Kohler (2004) foresees that the Enlargement might increase welfare in the new members. His econometric model shows that that increase will be only 0,3% of the gross product of these countries.

Studies has been conduced in order to assess the impacts of the CAP last reform using general equilibrium, partial equilibrium and mathematic programming techniques (BINFIELD; WESTHOFF; YOUNG II, 2003). Some says that this reform, mantaining high amount of subsidies to the farm though decoupled from production, will not impact in the production and trade of agricultural products in Europe. Some commodities, which is direct attached to subsidies

as oilseeds and bovine meat, production is expected to fall within EU. Meat production can be reduced by 4% by the year 2012. Dairy products production and exports might also be reduced (BINFIELD et al., 2005; FOOD AND AGRICULTURAL POLICY CENTER - FAPRI, 2003).

Studies dealing with impacts of EU Enlargement and CAP Reform are important in Brazil, especially in the agriculture sector. This paper aims to analyse the impact of 2004 EU Enlargement on Brazilian agribusiness. This is done with the aid of an applied general equilibrium, the GTAP. The following policies are modeled, as proposed by Jensen, Frandsen and Bach (1998) and Jensen and Frandsen (2003, 2004).

a) Elimination of import tariffs among the members of the European Union.

b) Equalization of external tariffs among the members of the European Union.

c) Specific aspects regarding agriculture and the Enlargement:

c1) milk production quotas;

c2) Bovine animals and arable crops subsidies;

c3) Bovine slaughter subsidies.

d) Specific aspects of CAP Reform – decoupling scenarios:

d1) partial decoupling of direct payments;

d2) total decoupling of direct payments.

## 2. Methodology

The Global Trade Analysis Project (GTAP) modelling framework is an innovative and interactive project dealing with impacts of trade in different industries and regions in the World. The modelling framework is public and the base data can be purchased or granted. Many GTAP applications and details on the model are available in the net (GTAP, 2006; HERTEL, 1997).

Main assumptions of the GTAP model are perfect competition in all markets, no scale economy and profit and utility maximizing behavior of producers and consumers, respectively The model represents the state a the world economy in a given year. Each industry produces only one commodity and land, labor and capital (primary factors) stocks are fixed within each region, though they may move through its different sectors. The demand of each industry for primary factors and intermediate goods is given by a Leontieff fixed proportions function. The source of inputs for each sector, domestic or imported, and the region from where it is imported, follows the Armington approach, with constant elasticity of substitution. The latest data base version is adjusted for the year 2001, and comprises 57 commodities and 87 regions in the World (GTAP, 2006; HERTEL, 1997).

Table 1 shows the level of regional aggregation used in this analysis. The aggregation use here covers 14 regions. Brazil is one of them. Two of these regions comprise the new Member States and five, the old ones.

Commodity aggregation is shown at Table 2. Agribusiness sectores are particularly detailed.

Different measures, consequences of the EU Enlargement and PAC reform, are modeled in this analysis. Details about them can be found in Oliveira (2005). The modeled measures are:

Import tariff removal among the EU members. This goal is achieved by implementing shocks on sectoral import tariffs within EU regions.

Establishment of milk production quotas in the new Member States, modeled as a shock in the quantity produced in the two regions that comprises these members.

Bovine animals and arable crop subsidies. Consists in special beef premium (due to the herd size), suckler cow premium and beef aditional payments besides premium to arable crops . Subsidies to arable crop are related to crop area and reference yield. In this study, such premium

is distributed among between the commodities wheat (trigo), other cereals, including corn (ocerea) and oilseeds (oleagi). As these subsidies to animal and vegetal production are linked to production process and not to trade, they were modeled as subvention to the factor of production land, as pointed out by Jensen, Frandsen and Bach (1998).

Bovine slaughter subsidies: They refer to premium due to animal slaughter. It is calculated as a function of the number and type (calves, adults) of animals. This subvention is modeled as direct subsidy on production. The shock is implemented in the variable that represents the power of the received subsidy by farmer.

Besides these measures, linked directly to the EU Enlargement, decoupling of direct payments was considered in this study, and it is the main modification of the CAP proposed by the 2003 Reform. This was modeled through subtracting and redistributing agricultural subsidies on land, labor, capital, intermediate consumption and additional subsidies introduced in the new members. It was considered subsidies on the following commodities: wheat (trigo), other cereals including corn (ocerea), fruits and vegetables, including orange and juices (fibveg), oilseeds, excluding meal and oil (oleagi), vegetal fibers (fibveg), coffee, cocoa and other crops (ccdcul), bovines, sheep, goats, horses and mules (bovovi), chicken, swine and other animals (frasui), milk (leite), rice (arroz), sugar cane and beet crop and sugar processing (acucar). These subsidies were redistributed among the industries above as land subsidy according to the demand of this factor of production in each sector. This approach follows Conforti, Filippis and Salvatici (2002).

Three Enlargement/ CAP Reform scenarios were considered. Total, partial and no decoupling of direct payments. The total decoupling was the total subtraction and redistribution of the subsidies already cited. The partial decoupling implied subtraction and redistribution of half of the subsidies. The last scenario considered no decoupling at all. Exceptions to decoupling and modulation were not considered in this study. This research did not consider the dynamics of

gradually implementing the measures on the new Member States. It is a static work, comparing the initial and final conditions.

The GTAP standard closure, adopted by this study, is a short run one. Capital stock is fixed. Although investiment is a variable within the model, it does not feeds the model, which is static. Investment is allocated across regions in such a way that all expected regional rates of return change by the same percentage.

Prices, commodities quantities, except land, labor and capital are endogenous, as national income. Variables related to technological change are exogenous. As they are not shocked, they are fixed. Population and labor force are fixed too. Capital and labor move among sector but not among regions. Land can move limitedly among sectors, according to its elasticity of transformation and it is a sluggish commodity. This closure is typically neoclassical. There is not economies of scale, free competition prevails as full employment.

## 3. Results

The EU Enlargement causes a modest impact on the value of the regional Gross Domestic Product (GDP). It is related to the short run closure of the model, which restricts the estimated impacts. Poland´s GDP diminishes 0.3% because of the Enlargement, under the three scenarios. The milk quota imposed to this country as condition to CAP adoption is one of the causes of this economic retraction. The aggregate effect of Enlargement on other EU members is not strong. The small economic weight of the EU new members is one of the explanations for that. The aggregate effect of Enlargement on Brazilian economy is also small. But it increases as decoupling takes places, indicating that this country may obtain gains as a consequence of the reduction of the agricultural subsidies within the EU (Table 3).

The aggregate exports of the EU new members increase. They grow more than 9% in Poland and more than 4% in the other new Member States, under the three scenarios of decoupling. The impact on other regions of this study, including Brazil, it is not significant (Table 4).

The EU Enlargement impacts on aggregate imports are more evident on the new members. They rise about 3% in Poland and 5% in the other new members, under the three scenarios. This magnitude is expected as these regions are the place of the Enlargement occurs. The bigger economic weight of the old EU members is according to the lower impact of imports observed on them (Table 5).

The EU Enlargement causes some impacts on the World aggregated production of many of the commodities analyzed. The most significant impact is observed on milk production, which diminishes 0.4% due to imposition of milk quota on the EU new members. As decoupling increases, the World aggregated production of industries that are heavily protected by EU policies decreases. The World production of milk (leite) and bovines, sheep and other animals (bovovi) decreases 0.8% under total decoupling. This fact illustrates the impact of EU policies on the World as Europe is one of the most important regions of the Globe on agricultural production (Table 6).

Other impacts caused by EU Enlargement are felt on commodities prices in a global scale. Milk World prices increases between 2.1% and 3.4% under the different scenarios. Bovines, sheep and other animals prices (bovovi) augments 4.1% under total decoupling scenario. Shorter supplies of these commodities explain these prices movements. Dairy products (latici) and bovine, sheep and other animals meat (cbovov) prices rise too (Table 7).

The EU Enlargement without decoupling causes different sectoral impacts on Brazilian economy. Oilseed (oleagi) and other cereals, including corn (ocerea) production are reduced by

0.8%. This fact illustrates the market loss for Brazilian products as a consequence of trade diversion caused by the Enlargement. On the other hand, coffee, cocoa and other crops (ccdcul) production rises 0.8%, as markets are open for Brazilian products. This opening occurs in the new EU members, as they have to stardandize their external tariffs with that prevail in the EU old members. Decoupling of the direct payments diminishes protection to some heavily protected sectors as meat and oilseeds. This fact favors Brazilian position on international markets. Brazilian oilseeds (oleagi) production increases 5.4% and bovine, sheep and other animals meat (cbovov) production rises 2.2% under total decoupling scenario (Table 8).

The EU Enlargement without decoupling leads to reduction on some Brazilian commodities exports. And this is due to trade diversion caused by the removal of import tariff between the new and the old Member States. Brazilian exports of corn and other crops (ocerea) reduces 1.8%. Coffee, cocoa and other crops (ccdcul) exports are favored by the EU common external tariff which hastens the inflow of this Brazilian commodity to the new members and increases 2.3%. Dairy exports, although of no importance yet on the Brazilian context, rise 1.5% as milk quota on EU opens market for Brazilian milk products. The Enlargement on the decoupling scenarios favors Brazilian commodities that are heavily protect within EU. Oilseeds (oleagi) and bovine, sheep and other animals meat (cbovov) exports increase more than 10%. Negative impacts are felt by fruits and vegetables (fruveg) and chicken, swine and other animals meat (cfrasu), which suffer decrease of 3.0% and 2.1% on exports, respectively (Table 9).

The main absolute Enlargement impacts on Brazilian exports without decoupling are felt on coffee, cocoa and other crops (ccdcul), which exports increase US$ 61 million. Oilseed (oleagi) exports diminish US$ 53 million. The impacts of EU Enlargement under total decoupling scenario are more impressive. Oilseeds exports jump from US$ 2,856 million to US$ 3,201 million, an increase of US$ 245 million. Bovine, sheep and other animals meat (cbovov) exports

rise US$ 198 million. Clothes, textiles, cars, electronics and other industrial products (oindus) exports decrease US$ 296 million. This high amount is explained by the total exports of this sector: almost US$ 29 billion in 2001. The short run closure of this study, keeping fixed the total stock of land, labor and capital within each region, explains this movement. One sector production (and export) have to be reduced to allow another to expand (Table 10).

The Brazilian sectoral imports are not significantly affected by EU Enlargement. The results dispersion trends to rise under decoupling scenarios, as this scenarios implies on more policy change. Imports of fats and vegetal oils (govege) decrease 3.4% and imports of chicken, swine and other animals meat (cfrasu) rise 1.3% (Table 11).

Impacts of welfare are more pronounced, as expected, in the new EU members. The decrease verified in Poland is significant, always above US$ 2.2. billion, under the three scenarios, and is due to GDP decrease expected in this country. Welfare increasing is verified in some regions comprising the old EU members and it grows as decoupling takes place. It reaches more than US$ 1,3 billion in some regions under total decoupling. This is an important indicator. It shows that decoupling, even though might reduce agriculture production in Europe, implies on rise of the welfare, as reallocates inputs through the different sectors in a given region. The welfare impacts in Brazil are not important. It never surpasses US$ 196 million, under the three scenarios.

## 4. Final considerations

This study has analysed the impacts of 2004 EU Enlargement of Brazilian agribusiness. It was achieved through two steps. The first step studied the process of European integration, including import tariffs removal, standardization of common external tariff and extension of the

CAP to the new Member States. The second step dealt with the 2003 CAP Reform, including its most important measure: the decoupling of the direct payments. As all these measures causes exogenous shock to the Brazilian economy, impacts on Brazilian exports are more significant than impacts on production.

The biggest impacts occur within the EU, as expected, especially in the new members. Some World aggregate sectoral results are important, but sometimes they are concentrated on the European Union. The aggregated impacts on Brazilian economy are small, but it grows with decoupling, indicating that this country might gain from subsidies reduction in the Europe.

The World production of some commodities as milk and bovine, sheep and other animals meat decrease under total decoupling. This is an example of the global impacts of EU agriculture policies. In this sense, all of the World, especially important agriculture producers as Brazil, should be concerned about CAP changes as its consequences are felt globally. Studying and understanding the EU agriculture policies, its changes and impacts in Brazil is strongly recommended.

The 2004 Enlargement process brings potential impacts on Brazilian economy that should be considered for planning and operating sectoral, trade and research policies related to agribusiness. This is also important for private sector, such an information is an important subsidy for decision making.

Important opportunities for Brazilian agribusiness are pointed out by this study. Dairy industry, for example, may increase its exports, under the three scenarios considered. Although this sector is not relevant for Brazilian exports yet, it may generate income and employment as it is a labor intensive activity ((OLIVEIRA; MIRANDA, 2004).

The Enlargement under total decoupling benefits some strategic industries for Brazilian exports as bovine, sheep and other animals meat and oilseeds. But the last CAP Reform foresees

a phased decoupling plenty of exceptions, many of them depending on each EU country decision. The extension of decoupling implementation is still an uncertainty.

The decoupling process teaches that changing subsidies without removing them is not enough to solve distortions imposed by CAP on agriculture international markets. It affects production and trade from less developed countries, including Brazil.

The results from this study have to be taken cautiously. They refer to a theoretical model that reproduces, in a limited way, the real World behavior. Some important institutional aspects are not taken into consideration. One of them is the trade agreement between EU and ex-colonies from Africa, Caribbean, and Pacific (ACP). The base data utilized in this study is a snapshot of regional economies as old as its input-output matrices. The Brazilian one is from 1996 and, at least for this country, international trade has changed a lot since them. Even though prices are calibrated for 2001, the structure of economy that responses to shocks is more than 10 years old.

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## 6. Tables

**Table 1 –** Regional aggregation

| # | code | region description | original GTAP regions |
|---|---|---|---|
| 1 | Brasil | Brazil | bra |
| 2 | Poloni | Poland | pol |
| 3 | RUE10 | new EU members, except Poland | cyp cze hun mlt svk svn est lva ltu |
| 4 | Escand | Denmark, Sweden and Finland | dnk fin swe |
| 5 | Atlant | UK, Ireland, Belgium, Netherland and Luxemburg | bel gbr irl lux nld |
| 6 | Aleaus | Germany and Austria | aut deu |
| 7 | Franca | France | fra |
| 8 | Medite | Greece, Italy, Spain and Portugal | grc ita prt esp |
| 9 | Nafta | United States, Canada and Mexico | can usa mex |
| 10 | Argent | Argentina | arg |
| 11 | China | China | chn hkg |
| 12 | RAsia | other countries in Asia | jpn kor twn xea idn mys phl sgp tha vnm xse bgd ind lka xsa tur xme |
| 13 | RAmeri | other countries in America | xna col per ven xap chl ury xsm xca xfa xcb |
| 14 | ROW | other countries in the World out of Asia and America | aus nzl xoc che xef xer alb bgr hrv rom rus xsu mar tun xnf bwa zaf xsc mwi moz tza zmb zwe xsd mdg uga xss |

Source: Research data.

**Table 2** – Commodity aggregation.

| # | code | commodity description | original GTAP sectors |
|---|---|---|---|
| 1 | trigo | wheat | wht |
| 2 | ocerea | other cereals, including corn | gro |
| 3 | fruveg | fruits and vegetables, including orange juice | v_f |
| 4 | oleagi | oilseeds, including soybeans, not including meal and oil. | osd |
| 5 | fibveg | vegetal fibers | pfb |
| 6 | ccdcul | coffee, cocoa and other crops. | ocr |
| 7 | bovovi | bovines, sheep, goats, horses, donkeys and mules | ctl |
| 8 | frasui | chicken, swine and other animals | oap |
| 9 | leite | milk | rmk |
| 10 | laseda | wool and silk | wol |
| 11 | evsilv | vegetal extraction and forestry | frs |
| 12 | pesca | fishery | fsh |
| 13 | eminer | mining | coa oil gas omn |
| 14 | cbovov | bovines, sheep, goats, horses, donkeys and mules meat | cmt |
| 15 | cfrasu | chicken, swine and other animals meat | omt |
| 16 | govege | vegetal fat and oil, including meal | vol |
| 17 | latici | dairy products besides milk | mil |
| 18 | arroz | rice (paddy and processed) | pdr pcr |
| 19 | acucar | sugar cane and beet crop, sugar processing | c_b sgr |
| 20 | dpalim | food products manufacturing, except sugar | ofd |
| 21 | bebtab | beverage and tobacco manufacturing | b_t |
| 22 | pquimi | chemical products including fertilizers | crp |
| 23 | mequipa | machines and equipment, including for agriculture use | ome |
| 24 | oindus | all the other manufactures, including building, clothes, textiles, wood and paper, automobiles, electronic devices, among others | tex wap lea lum ppp p_c nmm i_s nfm fmp mvh otn ele omf |
| 25 | servic | services | ely gdt wtr cns trd otp wtp atp cmn ofi isr obs ros osg dwe |

Source: Research data.

**Table 3** EU Enlargement effects. GDP percentual change, by region, under alternative decoupling scenarios

| regions | decoupling scenarios | | |
|---|---|---|---|
| | no one | partial | total |
| Brasil | 0,0 | 0,1 | 0,2 |
| Poloni | -0,3 | -0,3 | -0,3 |
| RUE10 | 0,0 | 0,0 | 0,1 |
| Escand | -0,1 | -0,1 | -0,1 |
| Atlant | -0,1 | -0,1 | -0,1 |
| Aleaus | 0,0 | 0,0 | 0,0 |
| Franca | 0,0 | 0,0 | 0,0 |
| Medite | 0,0 | 0,0 | 0,0 |
| Nafta | 0,0 | 0,0 | 0,0 |
| Argent | -0,1 | 0,0 | 0,1 |
| China | 0,0 | 0,0 | 0,0 |
| RAsia | 0,0 | 0,0 | 0,0 |
| RAmeri | 0,0 | 0,0 | 0,0 |
| ROW | 0,1 | 0,1 | 0,1 |

Source: Research data.

**Table 4** EU Enlargement effects. Percentual variation of the FOB value of exports, by region, under alternative decoupling scenarios

| regions | decoupling scenarios | | |
|---|---|---|---|
| | no one | partial | total |
| Brasil | 0,0 | -0,1 | -0,1 |
| Poloni | 9,2 | 9,1 | 9,6 |
| RUE10 | 4,5 | 4,4 | 4,6 |
| Escand | -0,1 | -0,1 | 0,0 |
| Atlant | -0,1 | 0,0 | 0,1 |
| Aleaus | 0,0 | 0,0 | 0,0 |
| Franca | 0,0 | 0,0 | 0,0 |
| Medite | 0,0 | 0,2 | 0,5 |
| Nafta | 0,0 | -0,1 | -0,2 |
| Argent | -0,1 | -0,1 | 0,0 |
| China | 0,0 | 0,0 | -0,1 |
| RAsia | 0,0 | -0,1 | -0,2 |
| RAmeri | 0,0 | -0,1 | -0,1 |
| ROW | 0,1 | 0,0 | 0,0 |

Source: Research data.

**Table 5** EU Enlargement effects. Percentual variation of the value of imports, by region, under alternative decoupling scenarios

| regions | decoupling scenarios | | |
|---|---|---|---|
| | **no one** | **partial** | **total** |
| Brasil | -0,1 | 0,1 | 0,3 |
| Poloni | 3,6 | 3,0 | 2,9 |
| RUE10 | 5,1 | 4,9 | 4,8 |
| Escand | -0,1 | -0,1 | -0,1 |
| Atlant | -0,1 | -0,1 | -0,1 |
| Aleaus | 0,1 | 0,1 | 0,0 |
| Franca | 0,0 | -0,1 | -0,1 |
| Medite | 0,1 | 0,1 | 0,2 |
| Nafta | 0,0 | 0,0 | 0,0 |
| Argent | -0,1 | 0,0 | 0,2 |
| China | 0,0 | 0,0 | 0,0 |
| RAsia | 0,0 | 0,0 | -0,1 |
| RAmeri | 0,0 | 0,0 | 0,0 |
| ROW | 0,1 | 0,1 | 0,1 |

Source: Research data.

**Table 6** EU Enlargement effects. Percentual change of quantity produced, by industry, under alternative decoupling scenarios, totals for the World

| commodities | decoupling scenarios | | |
|---|---|---|---|
| | no one | partial | total |
| trigo | -0,1 | -0,1 | -0,1 |
| ocerea | 0,0 | -0,1 | -0,3 |
| fruveg | -0,1 | 0,0 | 0,0 |
| oleagi | 0,0 | -0,2 | -0,3 |
| fibveg | 0,0 | -0,2 | -0,2 |
| ccdcul | -0,1 | -0,1 | -0,1 |
| bovovi | -0,2 | -0,4 | -0,8 |
| frasui | -0,1 | 0,0 | -0,1 |
| leite | -0,4 | -0,4 | -0,6 |
| laseda | 0,0 | 0,0 | -0,1 |
| evsilv | 0,0 | 0,0 | 0,0 |
| pesca | 0,0 | 0,0 | 0,0 |
| eminer | 0,0 | 0,0 | 0,0 |
| cbovov | 0,0 | -0,3 | -0,7 |
| cfrasu | -0,1 | -0,1 | -0,1 |
| govege | -0,1 | -0,2 | -0,3 |
| latici | -0,2 | -0,2 | -0,3 |
| arroz | 0,0 | 0,0 | 0,0 |
| acucar | 0,0 | 0,0 | 0,0 |
| dpalim | 0,0 | -0,1 | -0,1 |
| bebtab | 0,0 | 0,0 | 0,0 |
| pquimi | 0,0 | 0,0 | 0,0 |
| mequipa | 0,0 | 0,0 | 0,1 |
| oindus | 0,0 | 0,0 | 0,0 |
| servic | 0,0 | 0,0 | 0,0 |

Source: Research data.

**Table 7** EU Enlargement effects. Percentual change of World prices, by industry, under alternative decoupling scenarios

| commodities | decoupling scenarios | | |
|---|---|---|---|
| | no one | partial | total |
| trigo | -0,6 | 0,3 | 0,6 |
| ocerea | -0,6 | 0,3 | 0,6 |
| fruveg | 0,2 | -0,2 | -0,2 |
| oleagi | -0,2 | 1,0 | 2,1 |
| fibveg | 0,0 | 0,3 | 0,5 |
| ccdcul | 0,2 | 0,0 | 0,2 |
| bovovi | -0,4 | 1,8 | 4,1 |
| frasui | 0,2 | 0,1 | 0,1 |
| leite | 2,1 | 2,6 | 3,4 |
| laseda | 0,0 | 0,1 | 0,2 |
| evsilv | 0,0 | 0,0 | 0,0 |
| pesca | 0,0 | -0,1 | -0,1 |
| eminer | 0,0 | 0,0 | -0,1 |
| cbovov | -0,2 | 0,7 | 1,7 |
| cfrasu | 0,1 | 0,0 | 0,1 |
| govege | -0,1 | 0,3 | 0,8 |
| latici | 0,4 | 0,5 | 0,8 |
| arroz | 0,0 | 0,0 | 0,0 |
| acucar | 0,1 | 0,0 | 0,0 |
| dpalim | -0,1 | 0,0 | 0,0 |
| bebtab | -0,1 | -0,1 | -0,1 |
| pquimi | 0,0 | -0,1 | -0,1 |
| mequipa | 0,0 | -0,1 | -0,1 |
| oindus | 0,0 | -0,1 | -0,1 |
| servic | 0,0 | -0,1 | -0,1 |

Source: Research data.

**Table 8** EU Enlargement effects. Percentual change in commodity production, under alternative decoupling scenarios, Brazilian selected industries

| commodities | decoupling scenarios | | |
|---|---|---|---|
| | no one | partial | total |
| trigo | -0,2 | -0,1 | -0,1 |
| ocerea | -0,8 | -0,4 | -0,3 |
| fruveg | 0,1 | -0,6 | -1,0 |
| oleagi | -0,8 | 2,5 | 5,4 |
| fibveg | 0,0 | 0,5 | 0,5 |
| ccdcul | 0,8 | -0,1 | -0,5 |
| bovovi | -0,2 | 0,6 | 1,5 |
| frasui | 0,0 | -0,1 | 0,0 |
| leite | 0,0 | 0,0 | -0,1 |
| laseda | 0,3 | -0,9 | -2,3 |
| evsilv | 0,0 | 0,0 | 0,0 |
| pesca | 0,0 | 0,0 | -0,1 |
| eminer | 0,0 | -0,1 | -0,2 |
| cbovov | -0,2 | 0,8 | 2,2 |
| cfrasu | 0,0 | -0,6 | -1,0 |
| govege | 0,0 | 0,1 | 0,1 |
| latici | 0,0 | 0,0 | 0,0 |
| arroz | 0,0 | -0,1 | -0,1 |
| acucar | 0,0 | -0,1 | -0,3 |
| dpalim | -0,1 | -0,1 | -0,1 |
| bebtab | 0,0 | 0,0 | 0,0 |
| pquimi | 0,0 | -0,1 | -0,2 |
| mequipa | 0,0 | -0,2 | -0,5 |
| oindus | 0,0 | -0,2 | -0,4 |
| servic | 0,0 | 0,0 | 0,0 |

Source: Research data.

**Table 9** EU Enlargement effects. Percentual change in FOB value of Brazilian commodities exports, under alternative decoupling scenarios

| commodities | decoupling scenarios | | |
|---|---|---|---|
| | no one | partial | total |
| ocerea | -2,7 | -1,3 | -1,0 |
| fruveg | 0,3 | -1,8 | -3,0 |
| oleagi | -1,8 | 5,6 | 12,1 |
| fibveg | 0,1 | 2,5 | 3,5 |
| ccdcul | 2,3 | 0,1 | -0,6 |
| frasui | 0,4 | -0,2 | -0,5 |
| laseda | 0,3 | -0,8 | -2,1 |
| evsilv | 0,3 | -0,2 | -0,7 |
| pesca | 0,0 | -0,1 | -0,2 |
| eminer | 0,0 | 0,0 | 0,0 |
| cbovov | -1,8 | 6,6 | 16,8 |
| cfrasu | -0,1 | -1,3 | -2,1 |
| govege | 0,1 | 0,1 | 0,0 |
| latici | 1,5 | 1,6 | 2,1 |
| arroz | -0,4 | -1,0 | -1,7 |
| acucar | 0,1 | -0,3 | -0,7 |
| dpalim | -0,6 | -0,8 | -0,9 |
| bebtab | 0,4 | 0,2 | 0,1 |
| pquimi | 0,2 | -0,3 | -0,8 |
| mequipa | 0,2 | -0,5 | -1,2 |
| oindus | 0,0 | -0,5 | -1,0 |
| servic | 0,1 | -0,3 | -0,6 |

Source: Research data.

Note: Only industries with export value above US$ 10 million in 2001 were included.

**Table 10** EU enlargement effects. Initial values, percentual and absolute change of FOB value of Brazilian exports, by selected industries, under alternative decoupling scenarios

| industry | initial value (US$ million) | no decoupling | | | total decoupling | | |
|---|---|---|---|---|---|---|---|
| | | change | | final value | change | | final value |
| | | percentual (%) | absolute (US$ million) | | percentual (%) | absolute (US$ million) | |
| 1 trigo | 1 | -2,3 | 0 | 1 | 2,1 | 0 | 1 |
| 2 ocerea | 728 | -2,7 | -19 | 708 | -1,0 | -8 | 720 |
| 3 fruveg | 449 | 0,3 | 1 | 450 | -3,0 | -14 | 435 |
| 4 oleagi | 2.856 | -1,8 | -52 | 2.804 | 12,1 | 345 | 3.201 |
| 5 fibveg | 180 | 0,1 | 0 | 180 | 3,5 | 6 | 186 |
| 6 ccdcul | 2.613 | 2,3 | 61 | 2.674 | -0,6 | -17 | 2.597 |
| 7 bovovi | 6 | -1,2 | 0 | 5 | 10,0 | 1 | 6 |
| 8 frasui | 173 | 0,4 | 1 | 173 | -0,5 | -1 | 172 |
| 9 leite | 1 | 1,0 | 0 | 1 | -100,0 | -1 | 0 |
| 10 laseda | 35 | 0,3 | 0 | 35 | -2,1 | -1 | 34 |
| 11 evsilv | 41 | 0,3 | 0 | 41 | -0,7 | 0 | 41 |
| 12 pesca | 44 | 0,0 | 0 | 44 | -0,2 | 0 | 44 |
| 13 eminer | 3.860 | 0,0 | 0 | 3.860 | 0,1 | 2 | 3.862 |
| 14 cbovov | 1.178 | -1,8 | -21 | 1.157 | 16,8 | 198 | 1.376 |
| 15 cfrasu | 1.769 | -0,1 | -1 | 1.768 | -2,2 | -38 | 1.731 |
| 16 govege | 608 | 0,1 | 1 | 608 | 0,0 | 0 | 608 |
| 17 latici | 38 | 1,5 | 1 | 39 | 2,1 | 1 | 39 |
| 18 arroz | 11 | -0,4 | 0 | 10 | -1,7 | 0 | 10 |
| 19 acucar | 1.484 | 0,2 | 2 | 1.486 | -0,7 | -10 | 1.474 |
| 20 dpalim | 4.018 | -0,6 | -23 | 3.995 | -1,0 | -38 | 3.980 |
| 21 bebtab | 78 | 0,4 | 0 | 78 | 0,1 | 0 | 78 |
| 22 pquimi | 4.318 | 0,2 | 8 | 4.325 | -0,8 | -35 | 4.282 |
| 23 mequipa | 5.282 | 0,2 | 9 | 5.291 | -1,2 | -62 | 5.220 |
| 24 oindus | 28.758 | 0,0 | -3 | 28.755 | -1,0 | -296 | 28.462 |
| 25 servic | 8.671 | 0,1 | 7 | 8.678 | -0,6 | -55 | 8.617 |
| Total | 67.195 | 0,0 | -29 | 67.166 | 0,0 | -23 | 67.173 |

Source: Research data.

**Table 11** EU Enlargement effects. Percentual change in value imports of Brazilian commodities, under alternative decoupling scenarios

| commodities | decoupling scenarios | | |
|---|---|---|---|
| | no one | partial | total |
| trigo | -0,1 | 0,1 | 0,4 |
| ocerea | -0,4 | 0,1 | 0,4 |
| fruveg | -0,1 | 0,2 | 0,5 |
| oleagi | -0,1 | 0,7 | 1,6 |
| fibveg | -0,1 | 0,2 | 0,5 |
| ccdcul | 0,1 | 0,5 | 1,0 |
| frasui | -0,2 | 0,6 | 1,5 |
| evsilv | -0,1 | 0,1 | 0,4 |
| pesca | -0,1 | -0,1 | 0,0 |
| eminer | 0,0 | -0,2 | -0,4 |
| cbovov | 0,0 | 0,3 | 0,6 |
| cfrasu | -0,2 | 0,5 | 1,3 |
| govege | -0,1 | -1,7 | -3,4 |
| latici | -0,2 | 0,0 | 0,2 |
| arroz | 0,0 | 0,4 | 0,9 |
| acucar | -0,1 | 0,2 | 0,6 |
| dpalim | -0,1 | 0,1 | 0,4 |
| bebtab | -0,1 | 0,0 | 0,1 |
| pquimi | 0,0 | 0,1 | 0,2 |
| mequipa | 0,0 | 0,2 | 0,4 |
| oindus | 0,0 | 0,1 | 0,3 |
| servic | -0,1 | 0,1 | 0,3 |

Source: Research data.

Note: Only industries with export value above US$ 10 million in 2001 were included.

**Table 12** EU enlargement effects. Equivalent welfare variation, by region, under alternative decoupling scenarios, in 2001 million of dollars

| regions | decoupling scenarios | | |
|---|---|---|---|
| | no one | partial | total |
| Brasil | -6,7 | 87,5 | 195,8 |
| Poloni | -2.396,6 | -2.252,7 | -2.435,2 |
| RUE10 | -701,1 | -636,2 | -758,9 |
| Escand | 66,0 | 215,9 | 392,1 |
| Atlant | -74,0 | 900,6 | 1.658,7 |
| Aleaus | 447,4 | 1.163,9 | 1.783,4 |
| Franca | 79,1 | 753,7 | 1.315,1 |
| Medite | 513,3 | 1.188,7 | 1.946,9 |
| Nafta | -28,8 | 143,3 | 314,8 |
| Argent | -10,9 | 35,3 | 82,4 |
| China | 53,5 | 25,7 | -4,1 |
| RAsia | -7,4 | -7,8 | 7,5 |
| RAmeri | 8,4 | 5,0 | 18,4 |
| ROW | 532,7 | 546,5 | 606,5 |

Source: Research data.