IMPACTS OF A TRADE LIBERALIZATION AGREEMENT BETWEEN THE UNITED STATES AND THE EUROPEAN UNION ON BRAZILIAN AGRIBUSINESS☆

Abstract

This study measures the impact of a trade liberalization agreement between the United States (US) and European Union (EU) on Brazilian agribusiness. The model from General Equilibrium Analysis Project (PAEG) is applied. Results show an increase in welfare in the US and EU by US$11 and US$6 billion. There is a decrease in Brazilian welfare and GDP agribusiness by US$0.06 billion and 1.97%. Agribusiness exports decrease by 0.25% and imports increase only by 0.01%. Soybean and oilseed industry are the only sectors with a small positive response in production and in international trade flow. Impacts of this agreement on the Brazilian agribusiness is small.

Keywords: WTO, agribusiness, general equilibrium model, PAEG.

1. Introduction

The objective of this paper is to measure effects of a bilateral trade agreement between the United States (US) and the European Union (EU) on Brazilian agribusiness. It is used the General Equilibrium Analysis Project model (PAEG) for the Brazilian Economy.

The World Trade Organization (WTO) negotiation round began in 2001 in Doha, Qatar. Debated topics were those related to agricultural, especially market access, export subsidies and domestic support to production. According to Gurgel (2006) focus on the agricultural sector is due to the high on average tariff protection and because it is the only sector allowing export subsidies. Furthermore, many countries use subsidies to agricultural production as a protective measure. Thus, the negotiation agenda of Doha needs improvement in market access, export competition and domestic support measures.

In 2004, in Geneva, the WTO seemed to finally have reached a definition of multilateral agreements to be concluded. However, subsidy reductions the US and the EU were small magnitude which frustrated round. The negotiations were then taken to 2005, in Paris and in Hong Kong, aiming at a full elimination of export subsidies and reduction of production subsidy maximum rate. A consensus among the participants was not obtained, especially India, which made the negotiations stall in 2008. In December of 2013, in Bali, Indonesia, a new round of negotiation has been started. The objective is to discuss three main topics: reduction of customs bureaucracy, agriculture and measures to increase poor countries exports. One risk to WTO is becoming an irrelevant platform of trade negotiation. Today, there is a tendency for countries to look for bilateral trade agreements instead of bringing their negotiations to WTO as a regulatory forum. An example is the Trans Pacific Partnership Agreement. [1]

[1] The negotiations of the Trans Pacific Partnership Agreement (TPP) involve 12 countries: Australia, New Zealand, Canada, Brunei, USA, Malaysia, Japan, Singapore, Vietnam, Peru, Chile and Mexico. The objective is to create the biggest area of free trade in the world in both sides of the Pacific.

The continuous rounds of WTO are important for countries like Brazil, whose position is justified by its dynamic agricultural sector. Brazil has presented high growth of production and exportation of important agricultural commodities and it is one of the main exporters of soy and derivatives in the world, as well as sugar, meet, orange juice, coffee, corn and cotton. Multilateral or bilateral agreements are extremely important for Brazil that may reduce commercial distortions in agribusiness. (Gurgel, 2006).

There is a great number of studies that tried to measure possible effects of trade barriers reductions and tariffs on products of agribusiness. First, studies of Harrison et al. (1997) and Teixeira (1998) claimed effects of the Uruguay Round. There are still Harrison et al. (2003), Cline (2003), Rae and Strutt (2003), Cypriano and Teixeira (2003), Conforti and Salvatici (2004), Buetre et al. (2004), Gurgel (2006), Pereira et al. (2010) and others, about effects of expected scenarios of the Millennium Round and total trade liberalization of agricultural markets.

Studies showed that potential gains might be obtained for developing countries, including Brazil, through reduction and elimination of trade barriers in agricultural markets. Cline (2003) suggests that progressive reduction and elimination of trade barriers in a multilateral form, through discussions of WTO, would enhance the opportunities of trade and growth for developing countries. Bruete et al (2004) uses a tariff correction mechanism, via the Swiss formula, to measure multilateral agreements. Their results underestimate the potential gains given by the liberalization of agribusiness products. Recently, Gurgel (2006) suggests that the discussions of the Doha Rounds should focus on tariff reduction. The proposal of the Swiss formula for the reduction of tariffs brings high potential gains for Brazil and the world. In the research of Pereira et al. (2010), using PAEG, the authors consider that reduction of tariffs would generate aggregate losses for the Brazilian economic growth and welfare. Regions as the Southeast and South, historically important for the country, would be most affected via production reduction and international trade flow fall.

There is still a great necessity of information about the possible effects of tariff eliminations from multilateral and bilateral agreements on agriculture. For example, what are the benefits that agreements contrary to the WTO negotiations, especially bilateral agreements may bring to Brazil? Are differences in tariffs in bilateral agreements important? The answers to these questions may assist the negotiators in the evaluation of all liberalization alternatives in these markets.

Thus, the initial hypothesis of this paper is supported by the fact that formation of a bilateral trade agreement between the US and the EU tends to be beneficial to them in terms of product growth, welfare and international trade.

This paper is divided in three other sections besides this introduction. The next section presents methods and model. In the third section results of a total liberalization of trade between the US and the EU are discussed. The last section presents the final remarks of research.

2. Methods

2.1. Applied General Equilibrium Model - PAEG

The General Equilibrium models express the functioning of an economy through mathematical relations which represent the behavior of the economic agents in the many different markets of goods, services and factors of production. These models enable analysis and relations of agents given changes in public policies, such as tariff shocks, changes in the rates of taxes and subsidies, technological change and alterations in the international trade flows as economic blocs are formed or disintegrated.

The model selected for this research is the General Equilibrium Analysis Project (PAEG) of the Brazilian Economy, which represent the economies of great Brazilian regions and partner countries. The model also

allows for analysis of trade flows and trade protection as well as the application of changes in policy variables for regions (Gurgel et al., 2010).

PAEG is based on the Global Trade Analysis Project (GTAP) model. Unlike GTAP, which uses the programming language of GEMPACK, PAEG uses the Modeling Programming System for General Equilibrium (MPSGE) syntax, which solves for a non-linear complementarity problem in GAMS programming language (Rutherford (1999)). This variation of GTAP is commonly known as GTAPinGAMS (Rutherford and Paltsev, 2000) and its advantage in relation to original version are higher flexibility and facility that the researcher has to accomplish modifications on original structure of the model. In addition, PAEG expanded representation of the Brazilian economy by disaggregating the data referring to Brazil on the big five Brazilian regions (North, Northeast, Middle West, South and Southeast).

2.2. PAEG Structure

The PAEG model is static, multiregional and multi-sector. PAEG represents production and distribution of goods and services in the world economy. Which each region is represented by a final demand structure where agents act optimally in order to maximize their welfare subject to their budget constraint, considering the investment, capital flow and public sector production as fixed (Gurgel et al., 2010).

The general structure of PAEG can be seen in Figura 2.2. The variables of economic model are Y_{ir}, as production of good i in region r. The C_r, I_r, and G_r, which are private consumption, investment and public consumption in region r. The M_{jr} represents the importation of good j by the region r; HH_r is the variable for representative consumer agent (or household); and $GOVT_r$ is the public sector or government. In addition, FT_{sr} is an activity through which specific inputs are allocated to particular sectors.

In Figure 2.2, flows in good and input markets are represented by solid lines or irregular scattered line, while tax payments are represented by the regular scattered line. Domestic and imported good markets are given by vertical line on right side of the figure. Domestic production (vom_{ir}) is distributed between exportation ($vxmd_{irs}$), international transportation services (vst_{ir}), intermediate demand ($vdfm_{ijr}$), private consumption ($vdpm_{ir}$), investment ($vdim_{ir}$) and government consumption ($vdgm_{ir}$). The Social Accounting Matrix (SAM) which refers to the domestic production is presented in equation (1).

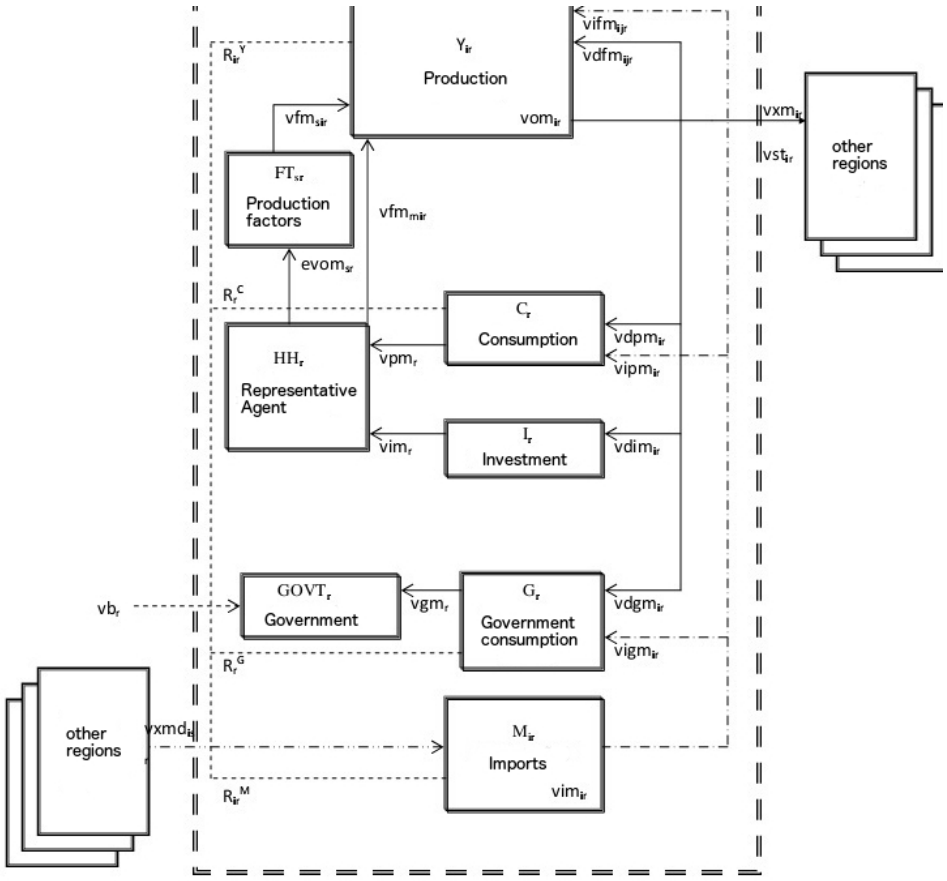
$$vom_{ir} = \sum_{s} vxmd_{irs} + vst_{ir} + \sum_{s} vdfm_{ijr} + vdpm_{ir} + vdgm_{ir} + vdim_{ir} \tag{1}$$

Imported goods are represented aggregately by (vim_{ir}). These goods are used in the intermediate consumption ($vifm_{jir}$), private consumption ($vipm_{ir}$) and government consumption ($vigm_{ir}$). Equation (2) presents the accounting identity of these flows:

$$vim_{ir} = \sum_{j} vifm_{jir} + vipm_{ir} + vigm_{ir} \tag{2}$$

In the production of Y_{ir} are included the intermediate inputs (domestic and imported), mobile factors of production ($vfmf_{ir}, f \in m$) and consumption of public agent ($vigm_{ir}$). The income of production factors is distributed to the representative agent. Equilibrium in factor markets is given by an identity which relates the payment value of the factors to their income (3):

Figure 1: PAEG Model flow



Source: PAEG.

$$\sum_{j} vfm_{jir} = evom_{fr} \tag{3}$$

The equilibrium condition between demand and supply in international markets, requires that the exportation of good i by region r (vxm_{ir}) be equal to importation of the same good by all trading partners ($vxmd_{irs}$), as represented in relation (4):

$$vxm_{ir} = \sum_{s} vxmd_{irs} \tag{4}$$

Similarly, the equilibrium conditions also apply to international transport services. Aggregate supply of transport service j, vt_j is equal to value of transport service exportation (5):

$$vt_j = \sum_r vst_{jr} \tag{5}$$

The equilibrium between supply and demand in the market of transport services, equals the supply of these services to the sum of bilateral transport service flows acquired in importation of goods ($vtwrj_{isr}$), as is equation (6):

$$vt_j = \sum_r vtwr_{jisr} \tag{6}$$

The revenues of taxes and transfers, indicated by the scattered line, are represented by the letter R. The tax flows consist of indirect taxes on production and exportation (R^Y_{ir}), on consumption (R^C_r), on government demand (R^G_r) and on importation (R^M_{ir}). The income of the government also includes direct taxes to representative agent, represented by R^{HH}_r, as well as external transfers, vb_r. The budget constraint of government can be represented by equation (7):

$$vgm_r = \sum_i R^Y_{ir} + R^C_r + R^G_r + \sum_i R^M_{ir} + R^{HH}_r + vb_r \tag{7}$$

The budget constraint of representative agent relates income of production factor, discounting tax payments, as expenditures with consumption and private investment, as in relation (8).

$$\sum_j evom_{fr} - R^{HH}_r = vpm_r + vim_r \tag{8}$$

It is possible to observe two types of consistency of the database in the input-output matrices and national accounts: market equilibrium and balance of income. A third set of identities brings the net operational profits in economy sectors. In the PAEG model is assumed perfect competition and constant returns to scale. Intermediate input costs and production factors are equaled to the value of production and economic profits to zero. Such a condition applies to each of the productive sectors and activities, as in equations (9) to (15), as follows.

$$Y_{ir} \quad : \quad \sum_{f} vfm_{fir} + \sum_{j}(vifm_{jir} + vifm_{jir}) + R_{ir}^{Y} = vom_{ir} \tag{9}$$

$$M_{ir} \quad : \quad \sum_{s}(vsmd_{isr} + \sum_{j} vtwr_{jisr}) + R_{ir}^{M} = vim_{ir} \tag{10}$$

$$C_{r} \quad : \quad \sum_{i}(vdpm_{ir} + vipm_{ir}) + R_{ir}^{C} = vpm_{r} \tag{11}$$

$$G_{r} \quad : \quad \sum_{i}(vdgm_{ir} + vigm_{ir}) + R_{ir}^{G} = vgm_{r} \tag{12}$$

$$I_{r} \quad : \quad \sum_{i} vdim_{ir} = vim_{r} \tag{13}$$

$$FT_{fr} \quad : \quad evom_{fr} = \sum_{i} vfm_{fir} \qquad f \in s \tag{14}$$

$$YT_{j} \quad : \quad \sum_{r} vst_{jr} = vt_{j} = \sum_{irs} vtwr_{jirs} \tag{15}$$

The productive sectors are minimizing their costs subject to technological restrictions. The production Y_{ir} is characterized by selection of inputs from minimization of unit costs represented by optimization problem in relation (16) below. In these equations many decision variables correspond to initial data (or "benchmark") with the initial letter "*d*" replacing "*v*". Thus, $vdfm_{jir}$ represents the benchmark intermediate demand of good j in production of good i in region r, while $ddfm_{jir}$ represents intermediate demand variable, which corresponds to the equilibrium of production decision problem.

$$\min_{difm,ddfm,dfm} \qquad C_{ir}^{D} + C_{ir}^{M} + C_{ir}^{F} \tag{16}$$

subject to

$$\begin{aligned} C_{ir}^{D} &= \sum_{j} py_{jr}(1 + t_{jir}^{fd}) ddfm_{jir} \\ C_{ir}^{M} &= \sum_{j} pm_{jr}(1 + t_{jir}^{fi} difm_{jir} \\ C_{ir}^{F} &= \sum_{j}(pf_{fr}|_{f\in m} + ps_{fir}|_{f\in s}(1 + t_{jir}^{f}))dfm_{fir} \\ F_{ir}(ddfm, difm, dfm) &= Y_{ir} \end{aligned}$$

The optimization problem presented above defines the production function characterized in the model by a constant elasticity of substitution function. Which correspondents of the added value (primary production factors) may be substituted being that process determined by an elasticity of substitution represented by the parameter $esubva_{j}$ in the model. While intermediate input and added value are combined in a leontief function which may not be replaced by one another.

The choice among different trading partners importation is based on the presupposition of Armington that an imported good from a region is an imperfect substitute of same good but from different regions. Thus, bilateral imports are performed in the model following optimization problem described in (17):

$$\underset{dxmd,dtwr}{min} \qquad \sum_{s}(1+t_{isr}^{ms}\left(py_{is}(1-t_{isr}^{xs})dxmd_{isr}+\sum_{j}pt_{j}dtwr_{jisr}\right) \tag{17}$$

subject to

$$A_{ir}(dxmd, dtwr) = M_{ir}$$

which A_{ir} represents the import aggregate function. Transport services added proportionally to the value of imports from different regions, reflecting differences among countries on transport/transported unit margins. Consumption of private agent may be represented by a problem of minimization of cost given a level of aggregate consumption, as represented in (18):

$$\underset{ddpm,dimp}{min} \qquad \sum_{s} py_{is}(1-t_{ir}^{pd})ddpm_{ir}+pm_{ir}(1+t_{ir}^{pi})dipm_{ir} \tag{18}$$

subject to

$$H_{r}(ddpm, dipm) = C_{ir}$$

The final demand is characterized by a Cobb-Douglas function of compound goods formed by the aggregation of domestic and imported goods. Land and natural resources are considered specific factors of production given by a constant elasticity of transformation function. The supply of specific factors of production may be specified from an optimization problem, presented in (19):

$$\underset{dfm}{max} \qquad \sum(dfm_{sjr}ps_{sjr}) \tag{19}$$

subject to

$$\Gamma_{sr}(dfm) = evom_{sr}$$

which Γ_{sr} represents the constant elasticity of transformation function. The elasticity of transformation is represented by parameter $etrae_{f}$. International transport services are supplied as the sum of transport services exported by the many different countries and regions of the model. The problem of minimization is illustrated in (20).

$$\underset{dst}{min} \qquad \sum_{r}(py_{ir}dst_{ir}) \tag{20}$$

subject to

$$T_{i}(dst) = YT_{i}$$

The consumption of public sector is represented by a Leontief aggregation between goods composed of domestic and imported shares. The goods are not substitutable among one another. However, domestic and imported components of each good are responsive to prices and are substitutes given by elasticity of

substitution $esubd_i$.

The closing of the model considers that total supply of each input does not alter, but these factors are mobile between sectors inside a certain region. The factor land is specific to agriculture sectors, while natural resources are specific of some sectors such as mineral resource extraction and energy sectors. There is no unemployment in the model. Therefore, the prices of inputs are flexible.

On the demand side investments and capital flows are held constant as well as the balance of payments accounts. Changes in real exchange rate be done as to accommodate the variations of export and import flows after given shocks. Government expenditures may as well alter as the prices of goods change. Revenues from taxes will be subject to changes in activity level and consumption in the economy.

2.3. Welfare measure

Evaluation of benefits generated by creation of a free trade zone between the US and the EU will be done through an equivalent variation measure. This approach is commonly employed to measuring welfare gains when general equilibrium models are applied. This measure indicates increase in utility of domestic consumers in terms of consumption increase. Equivalent variation can be expressed as follows:

$$EV = \frac{(U^F - U^0)}{U^0} C^0 \tag{21}$$

where EV is the equivalent variation; U^F, U^0 the level of final utility and initial utility. C^0 is the private agent consumption in initial equilibrium. The equivalent variation measure expresses the change in consumption necessary to maintain the same level of utility to initial equilibrium prices when consumer faces a new set of prices. Such a measure indicates increases in welfare for positive values and reduction in welfare for negative values.

2.4. Database

The database of PAEG is updated for 2007 being connected to database of GTAP8, which is consolidated in 129 regions and 57 commodities. For purposes of this research the database had some modifications. Altogether 13 regions are compacted in the model. Besides the five great disaggregated Brazilian regions other regions are the US, the EU, Rest of Mercosur, Venezuela, Rest of America and Rest of Nafta, China and Rest of the World. The commodities of GTAP8 were aggregated in 19 sectors being the agricultural the most disaggregated. Table 1 lists the regions and sectors considered in this work.

It was simulated elimination of importation tariffs between the US and the EU. However, other tariffs and subsidies of these two regions with the other regions in the model were kept. The relations among the Brazilian regions did not suffer any changes either.

3. Results and Discussion

The simulated scenario is used to identify impacts of a possible bilateral agreement between the US and the EU. Its measures the potential gains that would have obtained if the full liberalization of agribusiness markets on involved regions and Brazil.

In Table 2 the results are presented in percent variation for EV and value in billion of dollars per year on welfare gain. As expected, there is an increase in welfare in regions of bilateral agreement. The US would have an increase in welfare by 0.111% equivalent to US$ 11.052 billion dollars per year, while the EU would have around US$ 6.641 billion dollars/year with an increase by 0.067% in welfare. In Brazilian regions only

Table 1: Model regional aggregation and sectors

	Regions	Sectors
1	Brazil - North (NOR)	Paddy rice (pdr)
2	Brazil - Northeast (NDE)	Corn and other cereals grains (gro)
3	Brazil - Middle East (COE)	Oil seeds (osd)
4	Brazil - Southeast (SDE)	Sugar cane and sugar industry (c_b)
5	Brazil - South (SUL)	Animal products (oap)
6	Rest of Mercosul (RMS)	Raw milk and (rmk)
7	Venezuela (VEN)	Other agricultural products (agr)
8	United States (USA)	Food products (foo)
9	Rest of NAFTA (RNF)	Textiles (tex)
10	Rest of America (ROA)	Wearing apparel leather products (wap)
11	European Union (EUR)	Wood products (lum)
12	China (CHN)	Paper products publishing (ppp)
13	Rest of the world (ROW)	Chemical rubber plastic prods (crp)
		Other manufacturing (man)
		Electricity gas manufacture distribution water (siu)
		Construction (cns)
		Trade (trd)
		Transport (otp)
		Services (ser)

northeast would have a slight gain in welfare by US$ 0.003 billion dollars per year. The other Brazilian regions would lose welfare and considering Brazil as a whole there is a decrease by 0.023% in welfare reaching US$ 0.06 billion dollars per year.

The gains in welfare for the US and the EU are a consequence of bilateral removal of importation tariffs, given that both the US and the EU are already consolidated as big world producers and consumers. By setting a bilateral agreement between them, the trade flow is intensified as well as the supply and demand of good and services in the economy and consequently welfare. However, for Brazil the losses in welfare are related to changes in prices of imported goods, especially those from the US and the EU, and of subsidized goods produced in the country. Thus, there is a slight decrease in welfare for Brazils‘ consumers because of fall in supply and higher prices of imported and domestic goods.

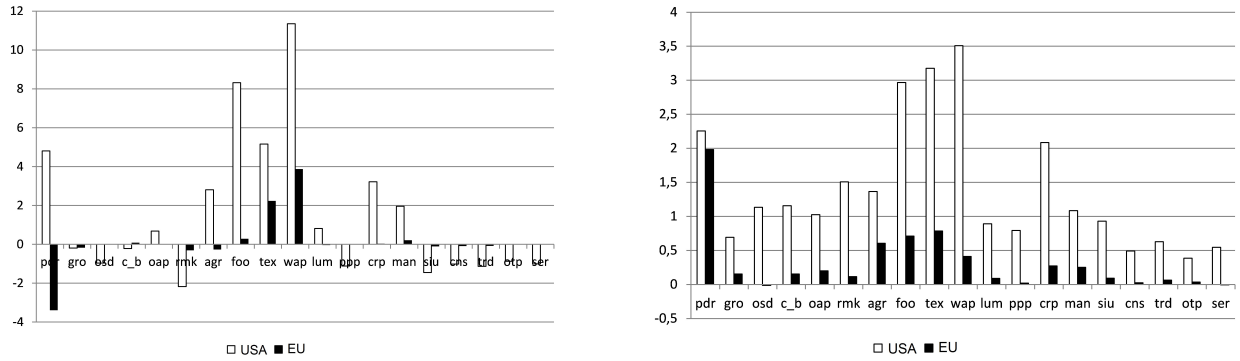
Table 2: Welfare changes in regions

Region	Elimination of importation tariffs	
	%	Billion (US$)
United States (US)	0.111	11.052
European Union (UE)	0.067	6.641
Brazil - North	-0.001	-0.001
Brazil - Northeast	0.003	0.003
Brazil - Middle West	-0.003	-0.002
Brazil - Southeast	-0.008	-0.037
Brazil - South	-0.014	-0.023
Brazil - Total	-0.023	-0.06
Total		17.633

Figure 3 has two panels (a) and (b) where it is presented the sector results for involved regions in bilateral agreement after removal of importation tariffs.

For the US there is an increase in exportations of paddy rice (4,806%) and other agricultural products

Figure 2: Percent change in exports (a) and imports (b) of the US and the EU.



(a) (b)

(2.81%) – such as wheat, fiber, fruits, vegetables. There is a high increase in exports of foods (8.319%), textiles (5.15%) and wearing apparel leather products (11.3%). For the EU there is a decrease in exportations of rice (-3.39%) and milk and derivates (-2.18%). Sectors like textiles (2.23%) and wearing apparel leather products (3.87%) there is an increase in exportation volume.

For import, there is a positive response of all regions analyzed. All sectors increase the volume of imports. This result shows that trade flow between regions and other regions of the model has risen due to elimination of tariffs. However, these results should be analyzed sector by sector, region by region. For example, the case of paddy rice there is a rise in imports associated to a reduction of exports in the EU, indicating a more intense trade flow with the US. However, by analyzing sectors such as food products, textiles, wearing apparel leather products, which presented growth in exportation and importation, not much is clear from the relation between both regions, it should, therefore, be considered the model as a whole.

The results for Brazil's sectors show an increase or decrease international trade flow with the US and EU and the others regions of the model. The results in Table 3 indicate that the impacts on production are negative for all agribusiness sectors, with exception for oil seeds sector. Sectors such as paddy rice, other agricultural products and food products, showed a decrease in production by -0.173%, -0.174% e -0.291%. The decrease in production is directly transmitted to exported volume which caused a decrease in all Brazilian regions and this result is showed in Table 3. Agribusiness exports as a whole suffered a decrease by -0.25% and an increase in imports by only 0.01275%.

The sector of oil seeds – soybean and oilseed industry – presented a growth by 0.258% in production and exported volume increased by 0.597% and imported 0.013%. The results of simulated scenario indicate growth of trade flow between the regions in the agreement. In contrast, results for Brazil were negative for production and Brazil suffer a reduction in international trade flow. As a result, the model and the analysis of results indicate that an agreement between the US and the EU, as debated in Bali, Indonesia, tend to decrease GDP Brazilian agribusiness. However, there is an increase in other sectors such as manufacturing that would reduce theses agribusiness losses.

4. Final remarks

The present work tries to illustrate how a bilateral agreement between the US and the EU may affect developing countries like Brazil. The PAEG model is used to study trade relations among regions with and

without the removal of tariffs.

The results allows for considering that market access is the main source of trade gains for agribusiness. Elimination of import tariffs between the US and the EU would increase production of these regions as trade flows are intensified among them. There is a rise in supply and demand of goods and services in these economies. An increase in welfare for both. Even with a small result this bilateral agreement may be considered maleficent to Brazil, because it reduces its participation in international markets. These results may be strengthened by fall of sector production levels particular sector trade flow reductions with the rest of the world.

Welfare losses due to simulated bilateral agreement are related to changes in prices of imported goods, particularly from the US and EU, and subsidized goods produced in the country. As a result, there is a loss of welfare for consumers of the country, due to lower supply and higher price of imported and domestically produced goods. Discussions must be focused on tariff reduction as a topic of negotiation with respect to agribusiness. Furthermore, it must take in consideration that subsidies to inputs and factors of production, commonly practiced in developing countries, may actually be driven into bilateral agreements and it may cause a distorting effect on international trade.

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Table 3: Percent change in exports and imports for Brazilian regions

Sectors	NORTH		NORTHEAST		MIDDLE-WEST		SOUTHEAST		SOUTH		BRAZIL	
	Exp (%)	Imp (%)	Exp (%)	Imp (%)	Exp (%)	Imp (%)	Exp (%)	Imp (%)	Exp (%)	Imp (%)	Exp (%)	Imp (%)
Paddy rice	-0.149	0.024	-0.269	0.082	-0.111	0.023	0.006	-0.016	0.049	-0.034	-0.474	0.079
Corn and other cereals grains	-0.045	0.006	-0.081	0.033	-0.044	-0.008	-0.022	-0.014	0	-0.013	-0.192	0.004
Oil seeds	0.071	0.008	0.094	0.036	0.1	0.002	0.191	-0.019	0.141	-0.014	0.597	0.013
Sugar cane and sugar industry	-0.061	-0.003	-0.122	0.075	-0.054	-0.011	0.027	-0.014	0.045	-0.079	-0.165	-0.032
Animal products	-0.033	-0.007	-0.067	0.021	-0.033	-0.018	0.022	-0.022	0.009	-0.018	-0.102	-0.044
Raw milk and derivates	-0.09	0.025	-0.153	0.066	-0.066	0.002	0.022	-0.024	0.03	-0.008	-0.257	0.061
Other agricultural products	-0.103	0.007	-0.237	0.048	-0.093	-0.007	-0.149	-0.021	-0.004	-0.034	-0.586	-0.007
Food products	-0.221	0.012	-0.298	0.066	-0.148	0.007	-0.188	0.003	-0.006	-0.06	-0.861	0.028
Textiles	-0.73	0.007	-0.187	0.02	-0.419	-0.011	-0.284	-0.034	-0.035	-0.063	-1.655	-0.081
Wearing apparel leather products	-0.807	0.017	-0.609	0.096	-0.66	0.031	-0.521	0.015	-0.025	-0.028	-2.622	0.131
Wood products	0.019	0.032	0.065	0.074	0.164	0.026	0.206	0.023	0.149	-0.093	0.603	0.062
Paper products publishing	0.238	-0.003	0.168	0.038	0.262	0.014	0.232	-0.163	0.271	-0.08	1.171	-0.194
Chemical rubber plastic prods	-0.009	-0.017	0.014	0.001	-0.062	-0.021	-0.025	-0.097	0.054	-0.051	-0.028	-0.185
Other manufacturing	0.015	-0.012	-0.078	0.027		0.005	-0.027	-0.075	0.089	-0.062	-0.001	-0.117
Electricity gas manufacture distribution water	0.154	0.018	0.073	0.01	-0.019	-0.03	0.058	-0.004	0.063	-0.083	0.329	-0.089
Construction	0.041	0.026	-0.016	0.029	-0.091	0.01	-0.064	0.018	0.022	-0.073	-0.108	0.01
Trade	-0.007	-0.017	-0.061	0.006	0.016	-0.026	0.081	-0.027	0.079	-0.091	0.108	-0.155
Transport	0.032	0	-0.001	0.007	0.073	-0.039	0.142	-0.044	0.119	-0.091	0.365	-0.167
Services	0.25	0.001	-0.011	-0.031	0.034	-0.049	0.093	-0.048	0.109	-0.083	0.475	-0.21