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Impacts of Agricultural Trade Liberalization on Poverty: Sensitivity of Results to Factors Mobility Among Sectors

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Impacts of Agricultural Trade Liberalization on Poverty: Sensitivity of Results to Factors Mobility Among Sectors

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Abstract
The purposes of this paper are twofold (i) to evaluate changes in welfare gains and their distribution due to trade liberalization when imperfect labor markets are considered, (ii) to evaluate the impact of the recent reforms of European agricultural policy on the world welfare. The results of two versions of a dynamic world computable genaral equilibrium (CGE) model, usign the GTAP database version 6 are compared. In the first version, a standard world CGE approach is followed by perfect labor mobility across sectors. In the second version we assume that labor shift s freely within the aggregated sectors –agriculture, manufactures, services,- but not across them. After a brief description of the two versions, changes in welfare, represented not only by the world GDP but also by the consumption level of two types of household (middle-low and middle-high) in 7 regions (Brazil, China, India, Least developed countries, European Union, United States, Rest of the World) after partial trade liberalization are presented. Theoretical and political consequences of the results are discussed.

Keywords
Trade liberalization ; market ; European agricultural policy ; labor market

Impacts de la libéralisation du commerce agricole sur la pauvreté: importance de la mobilité (intersectorielle) des facteurs de production

Résumé
Cet article a un double objectif (i) évaluer les modifications des gains de la libéralisation lorsque certaines imperfections des marchés du travail sont prises en compte, (ii) quantifier les impacts des réformes récentes de la Politique Agricole Commune. Deux versions d'un modèle mondial d'équilibre général, utilisant la base de données GTAP (version 6), sont utilisées à cet effet : dans la première l'hypothèse standard de mobilité parfaite du travail entre secteurs est adoptée, alors que dans la seconde on suppose que si le travail se déplace librement à l'intérieur de secteurs agrégés (agriculture, manufactures, services), il ne peut passer de l'un à l'autre. Après une brève description des principales caractéristiques des deux versions du modèle, les résultats obtenus dans des scénarii de libéralisation partielle, pour 7 régions du monde (Brésil, Chine, Inde, PMA, UE, USA, RDM) et deux types de ménages (riches et pauvres) sont présentés. Les conséquences théoriques et politiques sont ensuite discutées.

Mots clefs
Libéralisation des échanges ; marché international ; Politique Agricole Commune ; marché du travail

JEL: D4 ; D5 ; E3 ; Q1

Impacts of agricultural trade liberalization on poverty: sensitivity of results to factors mobility among sectors

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Abstract
The Purposes of this paper are twofold (i) to evaluate changes in welfare gains and their distribution due to trade liberalization when imperfect labor markets are considered, (ii) to evaluate the impact of the recent reforms of the European agricultural policy on the world welfare. The results of two versions of a dynamic world computable general equilibrium (CGE) model, using the GTAP database version 6 are compared. In the first version, a standard world CGE approach is followed with perfect labor mobility across sectors. In the second version we assume that labor shifts freely within the aggregated sectors -agriculture, manufactures, services- but not across them .After a brief description of the two versions, changes in welfare, represented not only by the world GDP but also by the consumption level of two types of households (middle-low and middle-high) in 7 regions (Brazil, China, India, Least developed countries, European Union, United States, Rest of the World) after partial trade liberalization are presented. Theoretical and political consequences of the results are discussed.

1. Introduction

Poverty alleviation and food insecurity reduction remain some of the main challenges for economists and policy makers in developing countries. However, despite a plethora of initiatives, very few improvements have been made since the sixties in the least developed countries. After around two decades of failing development projects and interventionist policies, trade liberalization has been presented as a solution in the early eightiees. Agricultural prices are expected to increase with trade liberalization because of the removal of distorting policies in the North, while the release of agricultural domestic and trade policies in the South is expected to allow the production factors to be more efficiently employed. Moreover higher agricultural prices may induce higher investment in agriculture as well as rural income growth, efficiently contributing to economic growth and poverty reduction (Timmer 1995). Accompanying trade liberalization negotiations, several studies[3], using partial or general equilibrium approaches address this issue and calculate the welfare gains associated with trade liberalization. However, at the same time, some authors (for example, Stiglitz 2003) underline the importance of government interventions in the presence of markets failures, as well as for the provision of public goods. The net welfare gain of trade liberalization with imperfect markets is a question still debated. Moreover, previous studies show that trade liberalization gains are unevenly distributed among developing countries and households types within country.

The purpose of this study is twofold: (i) providing information on consequences of world partial trade liberalization on poverty, with a special attention to differential impacts among developing countries and to distributional effects within the countries; (ii) contributing in CGE's methodology improvements through the comparison of results obtained with and without labour market imperfections. Results of two versions of a dynamic world CGE model, using GTAP data base version 6, will be analyzed and compared. In one version of the model, perfect labour mobility is assumed ; by contrast the second version includes labour market imperfections allowing only partial shifts of the labour force across sectors.

Several differences hold with previous studies representing labour market imperfections: (i) the model is based on a recursive dynamic approach and includes capital markets

[3] See for example the review performed by Van Tongeren et al. (2001)

imperfection ; (ii) rich and poor household are considered in order to assess distributive impacts within nations; (iii) we suppose endogenous wages but labour markets are segmented between agricultural and other sectors ; (iv) agricultural policies in Europe are explicitly represented, which allows to simulate the impacts on poverty alleviation of the recent European common agricultural policy (CAP) reforms and to compare them with the impacts of possible scenarios of agricultural trade liberalization under negotiation..

In a first section a brief literature review is performed, reminding the main results in term of poverty impacts of agricultural trade liberalization. The main features of the model used are then described with a special attention to its originality (section 2). The third section presents the scenarios analyzed and compares the results. Methodological and political consequences of the results are discussed as concluding remarks.

2. Poverty impacts of agricultural trade liberalization

Agriculture is an important sector in developing countries, representing still nearly 30 % of the least developed countries GDP and providing the larger part of employment there. It represents a key sector for alleviating poverty since in these countries, even if urban poverty is also important, the poor are mainly living in rural areas with agriculture as a major source of income. Moreover, farm incomes are known to have large spillovers on economic development.

On the international scene, agriculture has remained nearly outside the negotiations until the Doha Round, which did not lead to any agreement except for export subsidies. Thus agricultural markets are still characterized by high level of intervention and tariffs barriers in developed but also in some developing countries. Through trade liberalization, most agricultural commodities prices are expected to increase, leading to increase agricultural production and income in developing countries.

Another benefit is expected through the reduction of agricultural price volatility that could follow trade liberalisation. This price volatility decrease is supposed to come from two main sources. First, through a larger distribution of agriculture production amongst the different countries, the global impact of possible natural events affecting agricultural supply could be lower. Then, through the eviction of the large and unpredictable stocks that are resulting from agricultural policies of major developed countries as Europe, and running out through export subsidies on international markets. As everybody knows, agricultural price volatility is very harmful for producers, particularly of developing countries. What is still a controversial issue is the source of price volatility. Some authors point out that trade liberalization may not reduce agricultural price fluctuations when imperfect information and risks are considered (Boussard and al; 2005).

Of course, as the food share is dominant in poor household expenditures, the situation may not be so beneficial for food net importers since international price increase will increase consumer price and harm poor population. Thus, the impact of agricultural trade liberalization will depend on the position of each poor group net supply of the good to be liberalized country (Cirera and al. 2001).

Despite good initial expectations of positive impact of agricultural trade liberalization on poverty, several assessment of world general equilibrium models show less optimistic results. First, in term of US $ / head, very optimistic scenarios, as full trade liberalization, assess that

developing countries could expect an income increase of maximum 17 US$/head, which would probably be very insufficient to have large impact on poverty reduction (Table 1).

Table 1 – Level and distribution among nations of full trade liberalization benefits

Source	base	Developing countries	Developed countries	World	Developing countries	Developed countries	World
		Billion US $			US $ /head		
GTAP	2001	22	62	84	4,26	64,58	13,70
LINKAGE	2001	85.7	201.6	287,3	17,41	205,21	46,82

Sources : GTAP AGR :Hertel et Keeney (2006) ;Linkage : Anderson et al. (2006)

Then most models show that agricultural trade liberalization would rather benefit emerging countries (Argentine, Brazil, India, China) and not least developed countries (see table 2 and 3).

Table 2 -Level and distribution among nations of agricultural trade liberalization (Billion US $)

World	High Income countries	Developing countries			
		Total	Bangladesh	Mozambique	Others Sub-Saharan African countries
55.658	41.569	11.930	-0.50	-0.06	-1.67

Source : Hertel et Keeney(2006)

Table 3 - Level and distribution among nations of full trade liberalization (Billion US $)

World	High Income countries	Developing countries			
		Total	Low income countries	Section of Sub-Saharan African countries	Others Sub-Saharan African countries
287.3	201.6	85.7	16.2	1	2.5

Source : Anderson et al. (2006)

Finally, inside each country, the estimation of the impact of poverty is not always based on a detailed analysis of distributive impacts but on hypothesis linking economic growth and poverty level (through an elasticity parameter). However, as stated in a recent World Bank report (De Ferranti and al 2003), the capacity of economic growth to reduce poverty can be seriously harmed by the persistence of inequality.

Table 4 – Poverty impacts of full trade liberalization (variation of the number of persons living with less than 1$ a day, millions)

	Number of poor in the reference	Full trade liberalization, dynamic version	Full trade liberalization, comparative static	Doha scenario
Developing countries (Linkage)	622	-31.9	-23.8	-2.5
Sub-Saharan Africa (Linkage)	340	-21.1	-16	-0.5
Cameroon (GTAP)	6.3		+0.3	- 0.02
Mozambique(GTAP)	9		+0.06	+0.03

Source : Developing countries and Sub-Saharan Africa: Anderson et al(2006 b) p518-519 et Anderson et al(2006 a) p382 ; Cameroon and Mozambique : Hertel et Winters (2006) p.27

Former world general equilibrium models developed to analyze trade liberalization impacts were very optimistic about the capacity of markets, and particularly factors markets, to respond to trade liberalization. As stated by the authors of GTAP themselves, the most common modelling framework used on these issues, a lot of traditional GTAP model applications abstract from structural features that characterized global food and agricultural markets (Keeney and Hertel 2005). In the GTAP AGR model presented above, several new structural features have been introduced such as imperfect mobility of labour and capital between sectors, particularly between agricultural and non agricultural sectors. The factors supply is represented through a Constant Elasticity Transformation Function (CET), whose parameters are based on OECD elasticity estimation of agricultural capital and labour supply elasticity. In the LINKAGE model, rural and urban labour markets are segmented with a migration function between them depending on relative wages. Land and capital supply by sectors are also represented through a CET function.

The Canergie model has included unemployment in urban unskilled labour markets, a structural feature of a lot of developing countries (Polaski 2005). The results show again that modest results must be expected in term of poverty alleviation from agricultural trade liberalization.

It is difficult to compare the results of the different world general equilibrium models because of several assumptions that have to be made at this level of aggregation. Indeed, the predictive capacity of such models is probably low, as large variations of the results are found even from quite similar models as GTAP-Agr or LINKAGE. As also stated by Polaski (2005), the reliability of computable general equilibrium models results is constrained by data limitations and simplification of the economic reality to make the model computable. However, it does not mean that trying to improve these models to better represent the functioning of markets and analyze their impacts, is useless, quite the contrary. Allowing the test of several scenarios and hypothesis, such models can feed important policies debate in front of bilateral or multilateral trade negotiations, as soon as one is aware of the potential impact of key assumptions. They allow to compare policy impacts and to point out what could make the difference. Moreover when similar results are found based on different database or hypothesis, the findings may be more robust.

Whatever, most models finally agree that the negotiations will have very modest consequences on the eradication of poverty in the world, even assuming that markets are perfect[4].

3. The model

In this section, the main features of the model are exposed, with a specific attention to three original features (i) two versions of the model are considered to allow to evaluate the impact of perfect labour market; (ii) the financial market and investment decisions are detailed (iii) the representation of agricultural policies instead of using OECD subsidy equivalent estimations (PSE), modelling explicitly intervention on prices and public stocks[5].

3.1 General features

Let us define the sets I for factors, J for commodities, H for institutions, t for time. Denote by: F_j (.) a production function., U_{ht} (.) the utility function of consumer h, and G(.) the investment function which transforms inputs into factors – mainly capital, but manpower as well.

Call z_{hjt} the final consumption of commodity j by consumer h ; x_{ij} the quantity of commodity or factor i used as input for commodity j ; v_{hjt} the demand of commodity j by consumer h for investment, e_{hi}, the quantity of factor I belonging to institution k ; $\pi_{jt,}$ the profit of industry j ; s_{ht} the savings by institution h, δ_{hi} a depreciation rate. Prices are denoted by p_{jt} for commodity, π_{it} for factors.

The standard recursive[6] CGE can be described with the following equations:

(1) $F_j (... x_{ijt}..) = \sum_h z_{hjt} + \sum_{i \in I,J} x_{jit} + \sum_h v_{hjt}$, $j \in J$ (supply equates demand)

(2) $\phi_{jt} = p_{jt} F_j (... x_{ij}..) - \sum_{i \in J} p_{it} x_{ijt} - \sum_{i \in I} \pi_{i\,t} x_{ijt,}$ $j \in J$; (producer's utility)

(3) $\sum_j x_{ijt} = \sum_h e_{hit}$ $\forall i \in I$ (factors availability)

(4) $u_{ht} = U(...z_{hjt}.., s_{ht})$, $h \in H$; (consumer's utility)

(5) $\sum_j p_{jt} z_{hjt} = \sum_{i \in I} e_{iht} \pi_{it} + s_{ht}$ $h \in H$ (consumer's budget constraint)

(6) $\sum_h s_{ht} = \sum_h \sum_j p_{jt} v_{hjt}$ $h \in H$ (savings)

(7) $e_{hit} = e_{hit-1}(1 - \delta_{hi}) + G(..v_{hjt}\dots)$ $h \in H, i \in I$ (recurrence equation)

[4] The results are more pessimistic when one assumes that agricultural markets are imperfect (see for example Boussard and al. 2005).

[5] The explicit modelling of CAP is also made by Gohin in the MEGAAF model (see for example Gohin 1998), a French General Equilibrium model. So far, such attempt has not been made for world general equilibrium models.

[6] "Recursive" here means that plans $x_{t\tau}$ made at time t for time τ depend on observed past values x_{t-1}. However, $x_{t\tau}$ may be eventually revised, in such a way that $x_{t+1,1}$ may be different from $x_{t,2}$. Thus, in this framework, a model may be both recursive and multiperiodic, although the planning horizon is only one period ahead in all applications below.

The model is solved by writing the first-order conditions for producer's and consumer's optima, that are the derivatives with respect to x_{ijt} of equation (2) subject to (3), and the derivatives with respect to z_{hjt} and s_{ht} of equation (4) subject to (5). It is to be noticed that the only intertemporal equation is (7), which generalises the basic equation of capital dynamics. The standard version of the model is derived from these equations. In the imperfect labour market version, equation (3) , which allows complete shift of labour (skilled or unskilled) from one sector to another is replaced by freely shift within 4 subsectors (farm activities, manufacture, services, energy). Labour is immobile between these subgroups except in the last scenario tested where labour is freely mobile between the different sectors (see section 3.1).

As far as growth and accumulation are concerned, equation (7) and the function G(..v_{hjt}…) are of the utmost importance. In some CGE models, capital is easily shifted from one sector to another, so that this is invested in the most productive places. However, such assumptions are not very realistic: they imply that a nuclear power plant can be used to harvest grain It is not very realistic. Many models have been set up with sector-specific capital. The difficulty, in that case, is that neither capital nor labor are obviously stuck with any sector for ever. Some flexibility must be added. An original submodel has been developed for capital. The old capital is fixed by sector, just decaying at a constant rate. But the "new" capital owned by each institution is allocated between sectors according to a Markowitz(1970) mean/variance portfolio selection model. Let be :

k_{jt} : capital of branch j, time t
S_t : total saving period t
$\hat{\pi}_{jt}$: expected profitability of capital in branch j
$\hat{V}(\pi_{jt})$: expected variance of π_{jt}
A_k : risk aversion parameter for institution k
Pk_{jt} : price of the capital good for branch j
$\hat{Pk}_{jt}$: expected value of Pk_{jt}
I_{jt} : capital good bought for branch j, time t

Then, I_{jt} is chosen by investors through the maximization of :

(8) $$\sum_j \hat{\pi}_{jt} Pk_{jt} I_{jt} - A_k \hat{V}(\pi_{jt}) I_{jt}^2$$

subject to :

(9) $$\sum_j Pk_{jt} I_{jt} \leq S_t$$

with a naïve expectation scheme :

(10) $$\hat{\pi}_{jt} = \pi_{jt-1}$$

(11) $$\hat{P}_{kjt} = P_{kjt-1}$$

(12) $$\hat{V}(\pi_{jt}) = (\hat{\pi}_{jt-1} - \hat{\pi}_{jt-2})^2$$

In addition, since $\hat{P}_{kjt} \neq P_{kjt}$, some saving may last or be created on time t. It is then credited to or subtracted from saving year t+1. Various expectation and variance functions may be chosen.

The capital available for each branch j is updated in the recursive loop over time:

(13) $kj_{t+1} = kj_t (1-\delta_j) + I_{jt}$, where δ_j is capital depreciation rate.

3.2. Data and Others Setting

The Gtap data base (version 6) has been used to represent the world through 7 regions, 5 production factors and 11 sectors, including 8 for agricultural production (see Table 5).

Two types of households are considered, splitting the population around the income median, and defining middle-low income and middle-high income group, in order to be able to include equity considerations when analyzing the results.

Production is described by embedded CES production functions. At the first level, aggregate added value and aggregate variable inputs are considered. These are disaggregated at the second level, where two other CES are used, one for the five production factor and another for inputs. Parameters are taken from the GTAP data base.

Demand is a linear expenditure system, estimated by using GTAP income elasticities as well as consumption and price levels.

Exchange rates are exogenous. Investment is determined by savings and foreign capital flows, calculated to balance the external trade. Government budget is balanced through public consumption adjustment. The two versions of the model are dynamic, using temporary equilibria. Armington assumption of imperfect substitutes of products from different countries holds. Parameters as well as transport costs are taken from the GTAP data base.

Table 5 : GTAP database desegregation

Regions	Sectors	Production factors
European Union	Wheat	Unskilled labour
United States	Others cereals	Skilled labour
China	Livestock	Land
India	Other animal production	Natural Resources
Brazil	Milk	Capital
Least developed countries	Oilseeds	
Rest of the World	Sugar	
	Other Crops	
	Manufacturing	
	Energy	
	Services	

3.3. Agricultural Policies

An original feature of the model concerns agricultural policies in the European Union and United States, with a focus on market price support policies which should be dismantled along with trade liberalization and on decoupling, which should replace the old distorting measures. In much of the world CGE models, the true policies had been replaced by Price Support Equivalent (PSE) from OECD, as it is commonly found in the literature. Because a lot of energy has been devoted in Europe, along the last decade, to move from highly distorting price policy to more market friendly domestic support, it can be interesting to represent the real policies and these efforts as well as to evaluate its impacts on developing countries. Equations (14) to (17) describe mechanisms of public storage or subsidies as included in the

model instead of the PSE. One interesting feature is that it allows to evaluate the level of public storage as well as a more precise evaluation of costs.

For guaranteed prices in Europe, the equation for producer supply remains (2) where output price, p_{jt} is now the domestic market price, at least equal to the guaranteed price. In order to achieve that domestic market price be at least equal to the guaranteed price, the government store the excess of supply. A stock, $stor_{jt}$ is thus added to Equation (1 bis):

$$(14) \qquad F_j (... x_{ijt-1}..) = \sum_h z_{hjt} + \sum_{i \in I,J} x_{jit-1} + \sum_h v_{hjt} + store_{jt}, \qquad j \in J$$

and an equation is added to determine the stock level, considering pg_{jt}, the corresponding guaranteed price for j product :

$$(15) \qquad p_{jt} \geq pg_{jt}$$

We assumed here that public stocks are running out on the international market through export subsidies. The rate of export subsidies is endogenous for these goods. Because of WTO disciplines, the value of export subsidies allowed for each commodity is limited in value. If the limited is reached, the excess stock is destroyed.

The same kind of equations holds for agricultural sector benefiting from quotas (sugar - milk). The first difference with cereals and livestock is that a quantitative limit is imposed on the production bought at guaranteed price. Moreover, for sugar, over quotas production must be sold on the international markets without export subsidies.

For intervention policy in the United States, the scheme is different since such policy is more similar to a producer subsidy that does not affect domestic consumers, contrary to the European case. Thus (1) stays the same, but equation (2) becomes, with $inter_{jt}$ the level of intervention :

$$(16) \qquad \phi_{jt} = (p_{jt} + inter_{jt})\ F_j (... x_{ij}..) - \sum_{i \in J} p_{it}\, x_{ijt} - \sum_{i \in I} \pi_{it}\, x_{ijt} \qquad j \forall \in J ;$$

and another equation is also added to determine the intervention level, considering $pinterv_{jt}$, the intervention price set each year by the US government :

$$(17) \qquad p_{jt} + inter_j \geq pinterv_{jt}$$

4. Results and Discussion

4.1 Scenarios tested

The results of four scenarios are presented and compared:

- The **baseline scenario** is the reference and nothing changes between 2001 and 2012 except that new capital is invested from one year through the other between the different sectors (capital sub-model).
- In **the second scenario (CAP reform),** the CAP reform of 2000 and 2003 are introduced. Intervention price decreases are found in Table 6. Factor based payment to

land and capital are found in Table 7. They are first increased for cereals and livestock in order to compensate intervention price decrease. Then from 2005, decoupling is considered such that the subsidy rate to land is homogeneous across agricultural sectors (values between -0,68 and -0,70).

- **In the third scenario (lib-V1),** the CAP reforms of 2000 and 2003 are considered as well as agricultural trade liberalization. Export subsidies are progressively decreased from the year 2005 and finally set to zero in 2010. Import tariffs are reduced from the year 2005 and finally set in 2008 to 64 % of the initial tariffs for all developed countries and 76 % for all developing countries.
- **In the last scenario (lib-V2),** the same assumptions are made for CAP reforms and agricultural trade liberalization but unskilled and skilled labour are freely mobile between sectors (no labour markets segmentation).

Table 6 : Intervention price in Europe (% of 2001 initial value)

	2002	2003	2004	2005 et +
Cereals	-8 %	-8 %	-8 %	-8 %
Sugar				- 36%
Livestock	-8 %	-25%	-25%	- 25%
Milk				- 20%

Table 7 Factors based payments - (in % of factor value)

	2001	2002	2003	2004	2005 et +
Cereals (land)	- 0.88	- 0.94	- 0.94	- 0.94	- 0.70
Oilseed (land)	- 0.79	- 0.79	- 0.93	- 0.93	- 0.68
Other crops (land)	- 0.16	- 0.16	- 0.16	- 0.16	- 0.68
Sugar (land)	-0.18	- 0.18	- 0.18	- 0.18	- 0.68
livestock					
Capital	- 0.48	- 0.52	- 0.52	- 0.52	- 0.11
Land	- 0.10	- 0.10	- 0.10	- 0.10	- 0.68
Other animals					
Capital	- 0.01	- 0.01	- 0.01	- 0.01	- 0.01
Land	- 0.07	- 0.07	- 0.07	- 0.07	- 0.68
Milk					
Capital	- 0.13	- 0.13	- 0.13	- 0.13	- 0.04
Land	- 0.18	- 0.18	- 0.18	- 0.18	- 0.69

4.2. Some results

Aggregated results give a good idea of the global impact of the four scenarios. Changes in world GDP compared to the baseline are described in Figure 1. The first important feature of the results is the very small impact both of the CAP reforms and of trade liberalization, in relative terms and at the world level. The most significant impact is related to the mobility of labour and, even with perfect labour mobility between sectors, the GDP increase remains under 1.2%. This result underlines the importance of the assumptions, as factors mobility, in

evaluations of trade liberalisation gains. It questions also the confidence level to be grant to this kind of results.

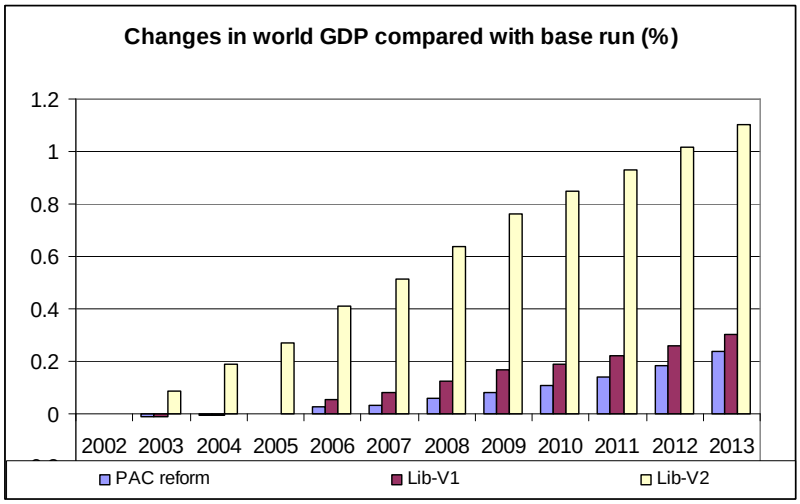


Figure 1

Shifting to more detailed results allow assessing the heterogeneity of impacts between countries and households groups. For the least developed countries, the impact of perfect labour mobility is favourable for the middle rich households but depressed the middle-poor group purchasing power (figure 2). It is linked to a significant decrease of unskilled labour price which is the dominant source of income of poor households.

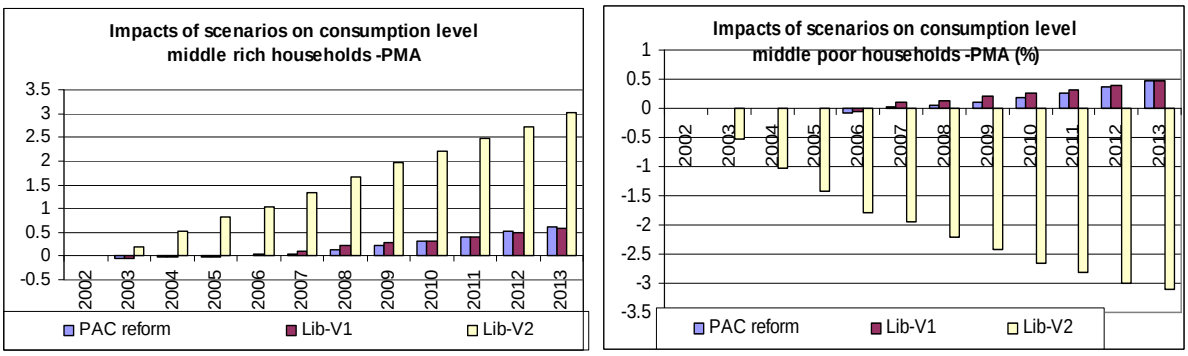


Figure 2

In the case of Brazil, the perfect mobility assumption has negative impact on consumption level for both “middle-rich” and “middle-poor “ households groups, but the impact is deeper for the rich. It is related to the fact that the Brazilian economy, as it is stressed in the GTAP data base, do not suffer from labour rigidity because its agricultural sector is very efficient and exhibits sharp increasing trend. Then, when other countries are not anymore constrained by labour rigidity, they act better and compete with the Brazilian economy, whose gains are thus reduced.

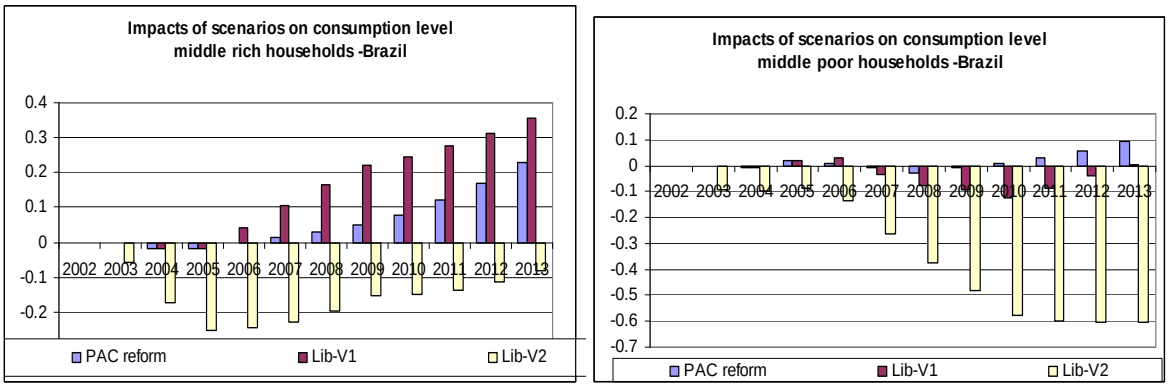


Figure 3

The impacts of the CAP reform on European agricultural production is important, especially for cereals and livestock production (figure 4)

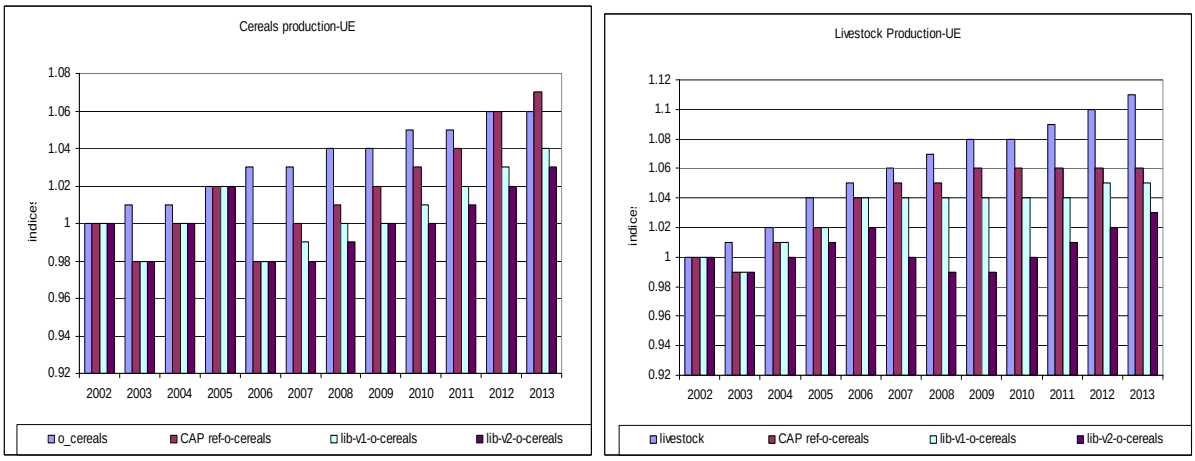


Figure 4

For these two sectors the impact of the CAP reform is relatively important because they suffer a sharp drop in guaranteed price as well as a decline in direct support. If the trade liberalization worsens the situation its relative impact is far less important. The impact of labour market imperfection is much more important on the livestock sector than on cereals. In the case of perfect mobility of labour, the livestock production will drop because labour may be employed with better wages in others sector than agriculture. By contrast, other sectors (other crops, other animals) benefit from the reform because the domestic support increases with decoupling and is not affected by the assumption on labour mobility.

Does this drop in European production benefits the least developed countries? Figures 5 allow answering by the negative.

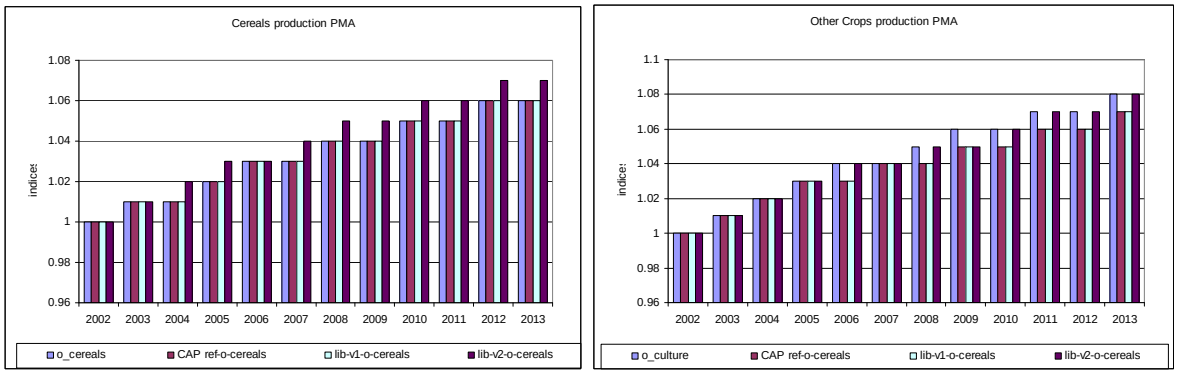


Figure 5

The cereals production is only affected by the change in labour market imperfection, while the production of other crops is also slightly negatively affected by the CAP reform. Agricultural production will increase in case of perfect labour mobility which is linked to a lack of economic activity outside agriculture in these countries.

Brazil, China and the rest of the world slightly increase their productions following the CAP reform. Impacts are a bit higher in case of liberalization. India and the least developed countries group do not benefit neither from the CAP reform nor from trade liberalization.

In fact, the principal country benefiting from the CAP reform, particularly when labour is freely mobile across sectors, is the United States (Figure 6 for the case of cereals and livestock[7]). This is linked to the fact that the scenarios tested do not consider any reforms of the agricultural policies in this country except the elimination of export subsidies and tariffs reduction. Thus all the agricultural sectors still benefit from intervention prices. Moreover, trade liberalization do not harm agricultural sectors because American import tariffs are already very low in the last version of GTAP database (2001), except for the sugar sector, and export subsidies are already null. These large production increases drive market price down and explain why other countries failed to benefit much from European agricultural production decrease and higher market access.

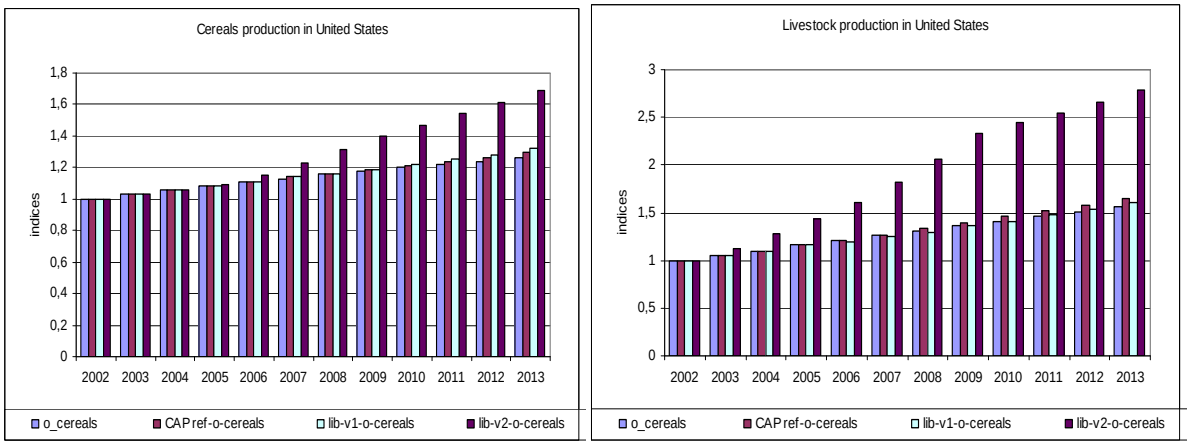


Figure 6

[7] Similar results are found for sugar, other-animals and milk.

5. Concluding remarks

In this paper, we focus on two main issues. The first one is linked to labour market adjustment costs: if labour is allowed to move freely from any sector to the others, does it change significantly the impacts of agricultural trade liberalization? The second one is linked to major agricultural reforms of the Common Agricultural Policy (CAP) in Europe. In effect, European policies are often criticized as they are still largely based on market price support and distorting factor-based payments, both forbidden in a liberal world. Europe has started to implement major reforms with the decoupling of agricultural subsidies and the decrease of intervention price. Will these reforms really affect agricultural trade liberalization impacts?

On the methodological side, we underlined the importance of assumptions on factor markets functioning on results. If it is not important in the trade liberalization impacts in the least developed countries group, it has a significant impact at the world level. That confirms the results of the Canergie model (Polaski, 2006) and other simulations including also unemployment will be performed.

On the impacts of recent European agricultural policy reform on the world welfare, the model presented here shows very few impacts. However they are a little higher than with partial trade liberalization. It is interesting to underline that the least developed country group benefits neither from the CAP reform neither from the partial trade liberalization scenario. In the partial rigidity of labour version, gains related to the CAP reforms are evenly distributed among emerging and developed countries. Impacts in these countries are low.

In any case, there is not any significant progress in terms of poverty alleviation in the least developed countries underlining the emergency of other international distribution channels than trade liberalization for these countries.

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