

Working Paper n.19

**THE EFFECTS OF ALTERNATIVE
PROPOSALS ON EXPORT SUBSIDIES
TO AGRICULTURAL PRODUCTS
IN THE CURRENT WTO ROUND**

P. Conforti e B. E. Velazquez

June 2003

The effects of alternative proposals on export subsidies to agricultural products in the current WTO round

Piero Conforti and Beatriz E. Velazquez**

Contributed paper presented at the Conference

**” Agricultural policy reform and the
WTO: where are we heading?”**

Capri, Italy, June 23-26, 2003

Keywords: *Export competition, GTAP model, WTO negotiations*

JEL classification: F13, F17, Q17

Corresponding author: *Beatriz E. Velazquez*
INEA – The National Institute of Agricultural Economics
Via Barberini 36, 00187 - Rome, Italy
e-mail: velazquez@inea.it

For this research the Authors benefited from a grant of the Italian Ministry of University and Technological Research (Research Program of National Scientific Relevance on “The WTO negotiation on agriculture and the reform of the Common Agricultural Policy of the European Union” coordinated by G. Anania).

June 2003

DRAFT

* INEA, The National Institute of Agricultural Economics, Rome, Italy. This paper is the outcome of the efforts of both the authors, that share fully responsibility of findings and opinions reported. However, should it be relevant for any reason, sections 1, 2 and 4 were drafted by B.E. Velazquez , while sections 3 and 5 were drafted by Piero Conforti.

The effects of alternative proposals on export subsidies to agricultural products in the current WTO round

1. Introduction

Agriculture is the only sector in which export subsidisation is still frequent. With the Uruguay Round Agreement on Agriculture (URAA), countries that apply this measure agreed to reduce both the volumes of subsidised exports, and the related expenditure; from 1986-90 to year 1999 the value of export subsidies decreased substantially. This was not only the outcome of the URAA commitments, but also a consequence of market and policy conditions, that implied a less frequent use of export subsidies compared to the base period.

The debate on export competition has revamped with the Doha round (Abare 2001a; Abare 2001b; Diao, Somwaru and Roe 2001; OCED 2000; Ruiz and De Gorer 2000; Leetmaa 2001; van Mejlil and van Tongeren 2001; Young *et al* 2001; CAPRI 2002; Elbehri and Leetmaa 2002). A group of countries, lead by the USA and the Cairns group, have proposed to eliminate export subsidies within the time frame of the application of the forthcoming agreement. The three major export subsidizing countries - the EU, Japan and Switzerland – while allowing for the need of further discipline in this area, proposed a softer reduction path, to be applied also to those labelled as “other forms of indirect and disguised export subsidisation”, like export credits, the operation of State trading Enterprises (STEs), and food aid shipments (WTO 2002b).

Altogether, export subsidization raises a kind of “food price dilemma”. Depressed world prices of agricultural commodities, originating *inter alia* from EU export subsidies, are deemed to be one of the causes of the displacement of farmers in importing countries. But export subsidies may be beneficial to consumers in these countries, since they will have cheap food available. To the extent to which there are vulnerable population groups in importing countries that are net food buyers, export subsidisation may be an advantage form them, at least in the short run. But in the long run, importing countries may increase their dependency on food import (von Braun, Wobst and Grote 2002).

Applied research results in this field tend to attribute an overall positive welfare effects to net exporting countries, and an overall negative welfare effects to net importing ones, and especially to low-income countries (Anderson, 1999; Anderson et al 2001). Traditional agricultural exporters are those more likely to benefit from a reduction of export subsidies (Bonët and Le Cacheux 2002, Messerlin 2002, Chau, De Gorter 2000).

The aim of this paper is to assess the impact of reducing and/or eliminating EU export subsidies within the next WTO round, both on the enlarged EU and on a selected countries and country group located in Asia, Africa and Latin America. The Global Trade Analysis Project (GTAP) model and database (Hertel 1997) are employed to study the effects of the two main proposals put forward in the Doha Round concerning EU export subsidies. Within the limitations imposed by the available database, an attempt is made toward improving the qualification of the frequently proposed divisions between winners and losers. Attention will be devoted to some of the effects on some “non-traditional” agricultural exporters, that are also likely also to be significantly affected by the reduction and the elimination of export subsidies.

The paper is structured as follows. Next section offers the background on export subsidies, by describing in more details the product and the markets involved, and the evolution of this practice after the URAA. Section 3 reports the details of the simulation, focussing particularly on the modelling of the policy tool, and on the design of the scenarios adopted in the simulation. Section 4 reports the main results of the simulations, which are first described in more general terms, and then qualified in more details for each of the scenarios. Concluding remarks are contained in section 5.

2. Agricultural export subsidization after the Uruguay Round

Export support commitments within the URAA included the reduction of subsidised exports and the value of government expenditure on export subsidies, on an individual commodity basis. Reductions were calculated with respect to the base period (1986-90), and were due to be fulfilled over a six-years implementation period. Developed countries were due to reduce expenditure in subsidised exports by 21%, and volumes of subsidised exports by 36%. Commitments for developing countries were one third that levels (OECD 2000). Moreover, all countries had the opportunity to change the base period if subsidised exports for the average 1991-92 years exceeded the base period volume, and to use this average level as a starting point for reductions; this implied the possibility of referring to a greater volume of subsidised export during the implementation period. Moreover, a roll over mechanism allowed countries to exceed bound levels (both expenditures and volumes), and to carry out these shortfalls to the following year; this was not allowed only in the final year of the implementation period.

Export subsidisation is today a highly concentrated phenomenon. 25 WTO member countries subscribed reduction commitments in the URAA, but by the year 1999 the EU had become the single major user of this measure, accounting for 93% of total expenditure in export subsidies. In that same year, Norway and the USA accounted for another 4%, followed by Poland, Czech Republic, Slovakia and Turkey, with minor expenditure shares.

From a commodity point of view, before the URAA, export subsidisation was significant for cereals, dairy and beef. Later on also this pattern has changed, since the subsidisation of cereals and beef decreased at a faster pace compared to dairy products and sugar. In 1998 dairy represented almost one third of total export subsidy expenditures, followed by cereals (21%), sugar (13%) and beef (11%). In the same period the share of subsidised over total export volumes decreased, since subsidized exports decreased while total exports expanded (WTO 2002a). This share is still relatively high in the EU, particularly for dairy products (38%), coarse grains (17%), and to a lesser extent for wheat (14%). For sugar, export subsidies were reduced down to the 5% of total export, they are still deemed to play a significant role in distorting world markets due to the wide share of the EU in world exports¹ (Abare 2001).

URAA commitments on export subsidisation have been the most difficult to handle for the EU, and virtually the only area in which compliance placed serious constraints. Although there were differences among commodities, in general the most binding commitments were those on volumes. For dairy products, rice and poultry meat it was necessary to constraint subsidised exports in all years of the implementation period, while for fruit and vegetables commitments resulted binding only in the first three years. Bovine meat needed a stronger

¹ As it is well known, distorting effects will be wider the “largest” the country that operates the export subsidies, where the word “large” is referred to the ability to affect world market prices.

support in 1996 and 1997, when, due to the BSE, consumption dropped and supply surpluses had to be exported (INEA 2002).

Today, after the end of the implementation of the URAA, there are products that the EU manages to export without subsidies – e. g. fruit and vegetables, poultry meat, wine - while some other still require subsidization. This is the case of those productions that still enjoy a relatively strong domestic price support system, like e.g. dairy products. For these, further reduction commitments in terms of reduction of export subsidisation may be relatively more problematic.

As mentioned, in the current WTO round two main positions emerged with respect to export subsidies (WTO, 2002c). The first is shared by the USA, the Cairns group, and a huge number of other countries² These countries underlined the need to eliminate export subsidies within a relatively short time period; particularly, the Cairns group proposes an immediate 50% reduction as a downpayment, followed by a progressive reduction up to elimination in three years, or in six years for developing countries. A wider group of countries shares the position of the Cairns groups – mostly Latin American including Nicaragua, Peru, and Zimbabwe – but also asks for more flexibility to be allowed to developing countries.

Opposite to this approach, the position expressed by the EU, Japan and Switzerland only allow that export subsidies are a measure to be reduced and disciplined. They propose a far more moderate reduction path, defined on a product-specific basis. For each product it is proposed to take into account bound export subsidies unit value, to be progressively reduced. As mentioned, an important further point made by these countries is that the same approach should be extended to those measures labelled as “other forms of indirect and disguised exports subsidisation”, notably export credits, the operation of State trading Enterprises (STEs), and food aid shipments including a relatively low grant element. More recently the EU tabled a comprehensive proposal, in which it was offered a 45% reduction in the total expenditure for export subsidies based on bound export subsidies unit values, and a “substantial” reduction in the volumes, provided that the other forms of disguised export subsidisation were also taken into account (Frandsen *et al* 2003).

The Draft Modalities presented last February (WTO 2003) attempted a compromise among these positions. The text on export subsidies proposed that:

1. developed countries select part of the products whose exports are subsidised - corresponding to the 50% of the expenditure in subsidies bound in the URAA commitments, i.e. to the level achieved in year 2001 - and phase out these within five years by implementing a minimum 30% per year reduction in both volumes of and expenditure in subsidised exports.
2. developed countries reduce the remaining 50% within 9 years, with a minimum 25% per year reduction in both volumes of and expenditure.

Developing countries are requested to follow a conceptually similar path, in which the first 50% needs to be phased out in 10 years with a with a minimum 25% per year reduction, and the remaining needs to be phased out in 12 years with a minimum 20% per year reduction. By computing subsequent percentage changes, it is evident that for the EU this proposal is likely to imply a strong downpayment in the first and in the last of the five years of the implementation period.

² 41 African countries, most countries of the Caribbean region, most countries of the Mercosur and the Andean Pact, plus India and Malaysia.

Thus, the reduction path envisaged in the above text is not as strong as the one proposed by the Cairns group, but it still leads to the phasing out of all export subsidies within few years, with the special provision allowing more flexibility for developing countries.

Moreover, the Modality text of export competition also includes provisions aimed at addressing concern on the other forms of disguised export subsidisation, i.e. export credits, food aid, and the STEs, and provisions to limit export restrictions and the Special and Differential Treatment. On the first three issues the text defines a set of value ranges and conditions in terms of the major characteristics of a credit, of food aid shipments and of the operation of STEs characterising their being *not* a disguised form of exports subsidization. These include, for export credits, the definition of the relevant type of export financing, ranging from maximum repayment terms, to minimum cash payment required, to the interest rates. Concerning food aid, it is required the use of grants rather than repayable long term loans, the need to use financial provisions in bilateral programme food aid, and the need for emergency operations to be run only after an appeal of the UN specialised Agencies. Concerning STEs, the attempt is to identify and prevent the danger that such agencies may exert market power and disrupt competition in agricultural world markets. In other words, on these three matters, given the difficulties to propose a discipline based on quantitative terms a more qualitative approach was attempted.

At the same time, it is clear that the Harbinson hypothesis on export subsidies is likely to have a relatively strong impact on the EU markets, and especially for cereals, dairy products, and sugar. It was probably for this same reason, that the proposal was substantially rejected by the EU Commission. Few days after the Harbinson text was released, the Commissioner Franz Fishler stated that it contained an unbalanced compromise on export competition, i.e. the elimination of export subsidies against substantial "loopholes" left on the discipline of export credits and food aid. He clearly pointed out that while the EU respected the commitments undertaken on the reduction of export subsidisation, commitments on export credits were not respected, especially by the USA (European Commission 2003, Agra Europe 2003).

Given this setting, it is hard to predict what the final compromise could be on this point. From an internal perspective, it appears highly unlikely that the EU will be able to accept a compromise that put additional pressure on the CAP reform process which is already underway, and that will require in itself a delicate compromise among the Member countries. In terms of the negotiation, on the other hand, there seems to be a large majority of countries that look favourably at a substantial reduction of export subsidisation. The Harbinson compromise, thus, may be correctly reflecting this numerical majority, but this does not appear to make it the most probable outcome of the negotiation on this point.

3. The simulation exercise

The GTAP model and the related database and simulation software (Hertel, 1997) has been employed to study the impact of a reduction of export subsidization within the Doha Round. The GTAP is a comparative-static standard multi-regional applied general equilibrium model that represents the global economy. In each region, production is represented by a set of nested constant returns to scale functions, based on the assumption of weak separability. Resource allocation among endowments, and among intermediate goods, is modelled with a Constant Elasticity of Substitution (CES) functional form, while allocation between endowments and intermediate goods is modelled with a Leontief function, that assumes fixed factor's proportions. Demand is represented by a non homothetic system, that

separates private demand from government demand. Expenditure allocation between these two components is modelled through a Cobb Douglas function, while allocation within the two components is modelled through a Constant Difference of Elasticity (CDE) functional form. The model assumes the existence of maximising representative agents in each country or region, and does not include information on the distribution. The public sector is represented solely through its demand, without a budget: thus public expenditure and revenues cannot be distinguished from total income of one country or region. Foreign trade is modelled through the so-called Armington assumption, by which domestically produced and foreign goods are considered as imperfect substitutes; this allows for bilateral trade flows to be modelled. Substitution elasticities are assumed to be different among goods, but homogenous across countries. The model also includes a transport sector, based on freights data for the most important commercial routes. The model has a standard closure, in which the level of saving determines the level of investment in each period. In turn, these are determined in each country by the equalization of the marginal rates of return; equilibrium conditions assure that global savings equal global investments. The standard version of the model is based on (modifiable) assumptions of perfectly competitive markets. Policies are mostly included as price wedges among different input and output markets (Hertel, 1997).

The GTAP database employed in this application is the latest available, known as version 5. This is referred to year 1997 (Dimaranan and McDougall, 2002). As the previous ones, this includes data for the whole global economy, in which trade flows are entirely reconciled, and made consistent with national accounts – input output tables – domestic and trade policy data, and macroeconomic data. The current 1997 version of the database includes up to a maximum of 66 regions, 57 sectors, and 5 endowments.

In this application, the model was run on an aggregation of the database including 14 countries and regions, 14 products (12 of which are agricultural and food products) and 4 endowments; these are all reported in Table 1. Countries and regions were chosen by considering those that are likely to be interested by the WTO discipline on export competition, both in terms of increased export shares, and in terms of increased import bills. Sectors were chosen by considering the most important agricultural and food products that are traded internationally

Table 1. Regions, products and endowments.

regions	products	endowments
EU15	wheat	land
Central and Eastern European countries ³	other cereals	natural resources
USA	oilseeds	labour
Canada	paddy rice	capital
Australia and New Zealand ⁴	processed rice	
Brazil	sugar cane & beet	
Argentina	processed sugar	
Rest of the Cairns Group ⁵	raw milk	
Japan	dairy products	
India	cattle	
Mediterranean countries ⁶	meats	
Sub Saharan Africa ⁷	other primary products	
China	secondary sectors	
Rest of the World	services	

The exercise presented consists in the simulation of four scenarios. The first two (A and B) constitute counter-factual experiments, run on the 1997 baseline with no modifications; they are meant to indicate in what respect that baseline would have been different with of i) a reduction the EU expenditure for export subsidies by 45%, as proposed by the EU itself, and with ii) a total elimination of export subsidies, as proposed in essence by the US and the Cairns Group. Being the model comparative static, the proposal implying the phasing out of export subsidies within the time frame of the agreement have been approximated with the full elimination of export subsidies.

Scenarios C and D are similar experiments, run on a more realistic baseline. The 1997 database was updated by shocking, first, the GDP, the labour force, total factor productivity and population, whose changes between 1997 and 2010 are either known, or reported as projections. Moreover, a set of policy shocks were introduced, accounting for the most important policy changes which have occurred so far, and that will most likely occur within the implementation period of the next WTO agreement. Emphasis has been put, in this context, on the EU policies, since this is the country for which export subsidies are by far most important. Particularly, it was considered:

- Agenda 2000,
- the Mid Term Review of the CAP,
- the EU enlargement to the Central and Eastern European Countries,
- the Everything But Arms (EBA) agreement, which is due to become effective in 2009.

The sources of information employed to calculate the shifts in the exogenous variables are reported in Table 2.

³ Includes Hungary, Poland, and an aggregation named “Rest of Central European Associates”. Together with Czech Republic, Slovakia and Slovenia, this item includes also Bulgaria and Romania, whereas it does not include Estonia, Latvia and Lithuania, that the GTAP database version 5 includes in a “Former Soviet Union”.

⁴ Includes Australia and New Zealand

⁵ Includes Indonesia, Malaysia, Philippines, Thailand, Botswana, South Africa, Uruguay, Chile, the “Rest of the Andean Pact”, and Colombia.

⁶ Includes Morocco, Turkey and a “Rest of North Africa” region.

⁷ Includes Malawi, Mozambique, Tanzania, Zimbabwe, Zambia, Uganda, “Other Southern African” and “Other Sub-Saharan African” countries.

Table 2. Sources of information

variable	source
GDP	International Monetary Fund
labor force	FAO - Faostat database
total factor productivity	Hertel and Martin (2000)
population	UN projections

Policy changes are implemented following mostly Conforti *et al* (2002), and drawing on the previous work by Van Meijl and Van Tongeren, (2000), which introduced a set of developments in the representation of the CAP measures within the standard model, particularly concerning the intervention mechanism and its interaction with the export subsidy GATT limitations. Changes in intervention prices are modelled as changes in the ratio of domestic to import prices, while milk production quotas are introduced by fixing the output at the quota level and allowing the production tax to adjust. Finally, land set-aside provisions are not represented, since Agenda 2000 did not change the rate of the year 1997, but only established that rate as a fixed one.

Of the MTR package, it was introduced in the simulation the market measures for cereals, and rice – durum wheat is not available as a single sector in the database – and the full decoupling of direct payments for cereals and livestock (and their distribution as a flat-rate subsidy to land).

The implementation of the EU enlargement included the elimination of trade barriers between the EU 15 and the CEECs, the alignment of output subsidies and trade measures, and an endogenous determination of a single payment per hectare, based on the expenditure commitments undertaken by the EU Council of Ministers held in Brussels in October 2002.

Direct payments are introduced in the model as *ad valorem* subsidies to factor use, i.e. as a subsidisation of land in the case of cereals and oilseeds, and as a subsidisation of capital in the case of livestock, to take into account subsidies paid per head in this sector; the slaughtering premium to bovine meat is introduced, instead, as an output subsidy. In order to represent the financial stabilisation mechanism associated with these payments – by which payments per hectare (per head) are reduced if the cultivated land (the herd size) exceeds the maximum threshold - a mechanism was added to the standard model, by which the expenditure for direct payments to cereals, oilseeds and livestock is fixed, and the unit subsidy adjusts to changes in production. Moreover, since direct payments are fixed in nominal terms, payments were reduced by 2% per year.

The shocks implemented to represent Agenda 2000, the MTR and the EBA are summarized in Table 3. The modelling of the CAP mechanisms is oversimplified in many respects. Major limitations, which are described in more detail in Conforti *et al* (2002), are in the modelling of the intervention mechanisms, which is approximated through changes in the border protection, and from the exclusion of important policy changes whose effect cannot be taken into account by the model; this is the case especially of the dynamic modulation, of the increase and modification of the rural development provisions, and of specific provisions for detailed products like durum wheat, which are not available as single items in the model. Scenarios are summarised in Table 4.

Table 3. Policy changes adopted in the 2010 database

Measure	shock	sources of calculation
Agenda 2000		
introduction of a slaughtering (coupled) bovine premium	increase in the output subsidy for the livestock sector	ratio of expenditure to the value of production in AGLINK; weight of bovine on total livestock from Van Tongeren and Van Meijl (2000)
increase in the semi-decoupled premium for bovines	increase in subsidy to capital for the livestock sector	44% decrease in the premium; weight of bovine on total livestock from Van Tongeren and Van Meijl (2000)
increase in direct payment for cereals	increase in the subsidy to land in the cereal sector	+ 16%, from 54 to 63 Euro/ton
decrease in intervention price for cereals	decrease in the ratio of domestic to import price and in related export subsidies	change in market price after change in the intervention price as in Van Tongeren and Van Meijl (2000); import price as 1.55 times intervention price
decrease in direct payment for oilseeds	decrease in the subsidy to land in the oilseed sector	-33% from 94 to 63 Euro/ton
increase in milk quotas	increase in raw milk output	2.4%
Mid Term Review of the CAP		
5% reduction in the intervention price of cereals,	reduction of the ratio of domestic to import prices	
50% reduction in the intervention price of rice	reduction of the ratio of domestic to import prices	
increase in the direct payment for rice growers	subsidy on value added	
35% reduction in the intervention price of butter	reduction of the ratio of domestic to import prices	
17% reduction in the intervention price of skimmed milk powder	reduction of the ratio of domestic to import prices	
increase in milk quotas	increase in raw milk output	2%
full decoupling of direct payments	endogenous flat rate <i>ad valorem</i> subsidy on land use based on exogenous (fixed) expenditure (Conforti et al, 2002)	Brussel Council expenditure decisions of October 2002)
EU enlargement		
elimination of all trade measures between the CEECs and the EU15		
alignment of import taxes and export subsidies		
alignment of output subsidies		
establishment of a decoupled subsidy on land use	endogenous <i>ad valorem</i> rate based on exogenous (fixed) expenditure (Conforti et al, 2002)	Brussel Council expenditure decisions of October 2002)
EBA agreement		
elimination of import taxes from Sub Saharan Africa to the EU and CEECs	proxy of ACP countries	

Table 4. Scenarios simulated

sceario	baseline on which is run	experiment
A	1997, database version 5	45% reduction in expenditure for export subsidies
B	1997, database version 5	elimination of export subsidies
C	2010, updated database	45% reduction in expenditure for export subsidies
D	2010, updated database	elimination of export subsidies

The Harbinson text was not considered in the simulation, for two reasons. First, one key point of the proposal allows to allocate commitments over a set of products accounting for 50% of the total expenditure in export subsidies. It is not straightforward to identify a criterion for selecting the products that Governments will exclude from the reduction commitments. Secondly, given the reactions from the EU, it is hard to assign a high probability of success to the Harbinson compromise.

Export subsidies in the GTAP are modelled as unit *ad valorem* negative subsidies on exports. Uruguay Round commitments concerning export subsidies are particularly difficult to implement, for two reasons. First, it is impossible to implement a quantity constraint in the model; second, it is not possible to take into account both subsidized and unsubsidized exports; and, third, it is impossible to model the different rates of reduction that countries need to adopt in order to fulfil the commitments. An usual strategy is to reduce the unit export subsidy by a given amount.

In the case of the proposals put forward in the current negotiation round, the situation is somehow less unfavourable. The EU proposal, as seen, implies a single commitment for all commodities in terms of a reduction in the expenditure. This was represented by a (uniform) reduction in the unit subsidy that - as checked through trials and errors - reduces total expenditure by the desired amount. This does still require the assumption that expenditure will be reduced homogeneously across all interested products, but at least is not meant to be a proxy for a quantity constraint. Other proposal put forward in the negotiation are all aimed at eliminating export subsidies; and the implementation of this change is quite simple in the model.

It is useful to recall, finally, that the starting point data on export subsidies included in the GTAP version 5 database are retrieved from the data on the volumes and expenditures on export subsidies, divided by commodity, that WTO members have been required to submit to the Secretariat from 1995. Export subsidy rates were calculated as ratios of the 1998 values of export subsidy expenditures to the FOB value of exports for 1998 retrieved by the UNCTAD trade data (Elbehri, 2001).

4. The results

Results obtained with the 1997 baseline (scenarios A and B) are similar to the one obtained with the 2010 baseline (C and D), but changes are generally smaller in size. This is the case especially for supply response, and for market price and welfare changes. The largest

variations obtained in the last two experiments are most probably the outcome of the modifications in the policy setting arising from the introduction of Agenda 2000 and of the MTR in building the 2010 baseline.

Aside from this difference, in general, both price and supply responses appear to be rather small in all the four scenarios, ranging from few percentage points up to a maximum of 10% to 15% in few cases. Equally small in size are also the welfare changes, ranging from 0.01% of GDP of developed countries, such as the EU and the US to the 0.2% of Sub Saharan African countries, to the 0.8% of Brazil and Argentina.

On the 2010 baseline, the 45% reduction in export subsidies expenditure proposed by the EU results in a price reduction in both the EU and the CEECs, whereas a price increase arises in the rest of the world. Despite the order of magnitude remains within the mentioned range, changes appear relatively wider compared to the same experiment run on the 1997 baseline, probably due to the CAP reform process, that may have increased the degree of market orientation of European agriculture, especially through the reduction of intervention prices, and of the related border protection. Production patterns seem to adjust accordingly, reflecting more closely the comparative advantages of some net exporting countries. For dairy products and meats, supply increases particularly in Australia and New Zealand; for raw and processed sugar, this is particularly the case of Brazil and of the “Rest of the Cairns group”; for cereals in general, production increases especially in Canada; and for coarse grains, particularly in Argentina.

By the same token, price increases resulting in the simulation of the EU proposal seems to imply improvements in the trade balances of major exporting countries, and to consolidate the leading positions particularly of Brazil in the sugar market, and of Australia and New Zealand in the dairy market. Moreover, production expands also in some importing countries: this is the case of meats for India, of raw milk in the Sub-Saharan African region, and for meats, sugar and dairy products in the Mediterranean area.

Results of the simulation of the US-Cairns group proposal - both scenarios B and D, run on the 1997 and 2010 baseline respectively- appear to drive the main economic variables in the same direction as those for the EU proposal, but are generally larger in size, especially for some countries and products. To some extent, this similarity can be the outcome of the modelling of export subsidies; as mentioned, what is not possible to include of the EU proposal is the room for manoeuvre left in the implementation, i.e. by deciding how to relocate the required cuts in expenditure.

However, the US-Cairns proposal implies higher production increases for the product that currently most supported by the CAP compared to the EU one; this is the case especially for sugar, meats, cereals and oilseeds. The enlarged EU would experience supply reductions for all these products, while increases would take place in other countries, particularly in Latin America, in the rest of the Cairns group, and in Sub-Saharan Africa.

Market price reductions, under the EU-Cairns proposal, would appear both in the enlarged EU and in many other exporting countries, like the US, Canada, and the “Rest of the Cairns” group, and also in other countries like India, the Mediterranean region, Sub-Saharan Africa, and China. While for the EU this result can be expected - as the outcome of an excess supply arising in the domestic market - for the non European exporters, this price decrease appears more puzzling. A possible explanation could be either that supplies would increase faster than local consumption; or that some of these countries’ exports would suffer from a relatively higher competitiveness of other exporters, emerging in world markets after the removal of the EU export subsidies. This may be the case of the US, Canada, and the “Rest

of Cairns group”, whose exports may be displaced, mainly by those of Australia, New Zealand, Brazil and Argentina. Price decreases in the other countries, appear even more puzzling: a possible explanation is that in these regions the price increase would raise domestic availability at a faster rate compared to consumption growth, thus determining a price reduction; for the Mediterranean countries this may be consistent with the evidence of increasing production in some typically imported commodities.

In general terms, the major net beneficiaries from this more radical scenario in which EU export subsidies are eliminated are countries like Australia and New Zealand, Brazil, Argentina and China; but substantial welfare gains would arise also for the enlarged EU and the CEEC, mainly due to improvement in their domestic resource allocation. While the first result is consistent with the requests for the elimination of export subsidies expressed by the countries involved, the opposite is true for the enlarged EU, since the welfare benefits foreseen arise mostly from economic adjustment and improved intersectoral resource allocation, that does not benefit farmers as a group, at least over the medium term.

4.1 Scenario A: 45% reduction of export subsidy expenditures on the 1997 baseline

This scenario implies a fall in the European production of all commodities whose exports are subsidised by the EU, while it increases in many other countries. Among products, major changes can be observed for dairy products, sugar and meat products.

For dairy, production increases mostly in the countries of the Cairns group, and particularly in Australia and New Zealand, and in Canada (table 5). A relatively high percentage increase takes place also in Sub-Saharan Africa, in the Mediterranean countries, and in China. A contraction is observed in the EU raw sugar supply, while an increase takes place in the producing countries of the Southern hemisphere, mainly in Brazil, and in India, but also in the Mediterranean countries, in China and in the Sub-Saharan region. A similar patterns applies also to paddy rice production, shifting from the EU and the US toward more Southern countries and regions. Cereals and meat products also shift from EU to other countries, but changes are generally small in size. It is interesting to note, however, that cereal production increases in several net importing areas, like the Mediterranean countries, and sub-Saharan Africa, as an effect of higher market prices.

Supply adjustments are accompanied by a generalised price increase, taking place particularly for dairy in Australia and New Zealand, and for coarse grains, cattle and meat products especially in Argentina, Canada, and Brazil (table 7).

An improvement would also take place in the trade balances for more than one major exporter. This is the case especially of Australia and New Zealand, of the US, and also of Canada, the Mediterranean countries and the “Rest of Cairns Group”, especially for dairy products (table 9). Brazil shows a major improvement in its sugar exports, together with the Mediterranean countries, Australia and New Zealand, the “Rest of Cairns group”, sub-Saharan Africa, and China.

Significant improvements in the trade balance for meat and cereals are also shown by the US, Australia and New Zealand, the Mediterranean countries, the “Rest of Cairns group”, Canada and Argentina. At the same time, the EU, Japan, Brazil and CEECs become more dependent on wheat imports; and also for coarse grains in the case of Japan and the EU.

This scenario brings about welfare improvements for several countries and regions, but the total effect is negative, despite being small in size (table 11). The gains of Australia and New Zealand, Brazil and Argentina are mostly due to more favourable terms of trade, while

for the EU there is a significant welfare improvement arising from improved resource allocation. Negative welfare effects arise in some net food importing countries, like the Mediterranean, Japan and Sub-Saharan Africa, but also for the CEECs, the US, Canada and China, due to both a worsened resource allocation and an unfavourable terms of trade effect.

4.2 Scenario B: elimination of export subsidies on the 1997 baseline

As mentioned, results for this scenario are similar in many respect to those of the previous one, and generally larger in size. As in the previous scenario, production tends to shift from the EU to other exporting countries, trade balances tend to move accordingly, and welfare gains arise for some net exporters, mainly due to improvements in their terms of trade, and in the EU, due to improved resource allocation. Food importers, the Mediterranean countries and Japan especially, would be net losers in terms of welfare, while overall a small net welfare gain would arise.

The European production of cereals would be displaced by increases in production occurring in most traditional exporters, especially those of Australia and New Zealand, Brazil and Argentina (table 6). And also some other net importing countries would show increases in supply: this is the case of Sub-Saharan Africa and of the Mediterranean countries. For dairy, production in Australia and New Zealand shows the largest increase, together with that of Canada, Sub-Saharan Africa, China and the Mediterranean, where increased local production results is mostly absorbed by higher consumption. For sugar (both raw and processed) production decreases in the EU, and increases in Brazil, but also in Mediterranean countries.

Supply adjustment result in a significant price decreases for all commodities, especially in the EU, the CEEC and in the US, while prices increase especially in Brazil (for almost all products), in Australia and New Zealand (especially for raw milk, dairy products, cattle, wheat, other cereals, paddy rice, and sugar products) and, to a lesser extent, in Argentina, especially for wheat, other cereals, paddy rice, raw milk, cattle, and meat (table 8). As in the previous scenario, price decreases in some exporting countries, such as the US, Canada and the Rest of Cairns should be explained by the relatively lower competitiveness of these countries compared to that of other exporters, like Australia, New Zealand, Brazil and Argentina, that would emerge with the removal of export subsidies.

Trade balances in EU worsens for almost all products, with the exception of cattle, paddy rice, raw sugar and raw milk (table 10), For dairy, significant improvements occur in Australia and New Zealand, Canada and the US. For sugar all trade balances decrease, with the exception of Brazil, the Mediterranean countries and India.

In general welfare changes in this scenario are higher compared to scenario A. Total gains reach almost 3.5 billion dollars, with major improvements in the EU, due to both improved resource allocation and more favourable terms of trade, and Brazil (table 12). Major losers under this scenario appear to be the Mediterranean countries and Japan. For the former, this is due to both from higher import prices and worsened resource allocation. Japan, instead, would experience a significant increase in its import bill, due to the increase in world prices; thus its welfare decrease mostly due to less favourable terms of trade.

4.3 Scenario C: 45% reduction of export subsidy expenditures on the 1997 baseline

Changes in European agriculture policies are the most likely reason explaining the difference between the results of this scenario and those of scenario A: as European agriculture becomes relatively more market-oriented after the CAP reforms of Agenda 2000 and its MTR, supply responses to the reduction in export subsidy become more pronounced. The model seems to capture this effect in the difference between the 1997 and the 2010 baseline.

Supply reacts in this way especially for products like cereals, meat and dairy, that are among the most involved in the CAP reform (table 5). Following the EU enlargement, the CEECs tend to move in the same direction. On the contrary, price would raise and production would increase in many of the other countries and regions (table 7). As in previous scenarios, sugar would increase especially in Brazil; dairy products especially in Australia and New Zealand, while cereals production would increase especially in Canada and Argentina. Supplies of these same products would also show increases in other non traditional producers like Sub-Saharan African countries, Mediterranean countries, China and India.

Accordingly, major changes in trade balances are observed for sugar, with Brazil, the “Rest of Cairns group” and the Mediterranean countries expanding their export bills (table 9). Improvements are observed also in Argentina, Australia and New Zealand, and the US for dairy and meat products, in Argentina and in the US for coarse grains, and in the US and Canada for wheat.

Total welfare gains in this scenario appears lower than that of the corresponding Scenario A, run on the 1997 baseline, due to more pronounced compensation between winners and losers (table 11). Brazil, Argentina, Australia and New Zealand would gain, mostly due to improvements in their terms of trade (in the latter), and due to both terms of trade and improved resource allocation in the two Latin American countries. The enlarged EU would gains about 2,4 billion dollars, due to both improved resource allocation and more favourable terms of trade. Welfare loss would arise, as in previous scenarios, especially for Japan, for the Mediterranean countries, for sub-Saharan Africa and even for the US; here, as mentioned, some products would be displaced to some extent from the competitive pressure exerted by middle income exporters.

4.4 Scenario D: elimination of export subsidy on the 2010 baseline

Also the US-Cairns group proposal implies larger and slightly different effects on the 2010 baseline, compared to the result of the corresponding scenario B, when this same proposal was analysed with respect to year 1997.

In this scenario cereal supply increases especially in Brazil, in Australia and New Zealand, in Canada, in Argentina and in the US (table 6). Sugar, rice, and oilseeds production also would increase significantly in Brazil, which consequently would substitute away from dairy and meat products. Dairy production increases would occur especially in Australia and New Zealand, and in Canada, while cereals supply, meat and dairy products would raise particularly in sub-Saharan Africa and in the Mediterranean region. On the contrary, agricultural supply decreases in the EU and CEECs,

Prices would increase in main net exporting countries, and especially in Brazil, Argentina, Australia and New Zealand, and in Canada (table 8). As reported also for scenario B, decreasing prices are observed, in the enlarged EU, and also in the US, the “Rest of Cairns group”, Sub-Saharan Africa, India and China. The same possible explanations apply also to

this case: these countries may turn out to be relatively less competitive than the Latin American exporters once export subsidies are eliminated, since this may lead to an increase in export availability faster than that of total demand.

As expected, Canada, Australia and New Zealand, Argentina, and USA show improved trade balances for cereal, dairy and meat products, as a consequence of either an increase in exports or - as it is the case for the the US - due to a decrease in imports (table 10). This is also the case for the Mediterranean countries, Sub-Saharan Africa and China. Brazil would improve considerably its trade balance for sugar and oilseeds under this scenario, while the enlarged EU would show a decreased trade surplus for most agricultural products, with the exception of dairy, paddy rice and raw sugar.

In terms of welfare, this scenario implies a significant gain (table 12), that would be captured mostly by Brazil, due to more favourable terms of trade, and by the enlarged UE, due to both improved resource allocation and terms of trade. Significant gains would also arise for Argentina, the US, Australia and New Zealand; while net importing countries, like Japan, and Sub-Saharan Africa, would incur in losses due to more expensive import bills. Finally, also some net exporters, like the Rest of the Cairns group and Canada to a lower extent, would experience a net loss.

5. Concluding remarks

The evidence proposed tends to confirm the common knowledge that the elimination of EU export subsidies would imply increasing prices, more market opportunities and increased agricultural production primarily for countries like Brazil, Argentina, Australia and New Zealand, and the Cairns group in general, that are currently operating close to world market conditions. Products involved are those that are currently more supported by the CAP: sugar, dairy, cereals, rice, and meats.

Another clear indication coming from the experiments is that the size of the effects on all most important economic variables are relatively small, ranging more or less from 5% to 10% change; nonetheless, they tend to increase both with the switch from the EU to the US-Cairns Group proposal, i.e. the more the scenario about export subsidies becomes radical; with the switch from the 1997 to the 2010 baseline, i.e. as the agricultural policy in the EU become relatively more market oriented; and with the EU enlargement to the CEECs.

At the same time, some other results emerged that appear to be less obvious. Firstly, within this group of countries there are specific sectors for which domestic prices would decrease, especially in a scenario simulating the US-Cairns group proposal, and when this proposal is assessed against the 2010 baseline. A possible explanation for this outcome is that within the same group of countries that are pushing for the elimination of export subsidies, the degree of competitiveness is variable enough to allow for some of them to gain a competitive position compared to some others. In other words, if benefits for countries like Brazil, Argentina, Australia and New Zealand for some products arise under all scenarios, for some others, and particularly the US and Canada this not always holds.

Secondly, despite net importing countries would suffer from a more expensive import bills, benefits may arise, as seen, for some of them in terms of incentives to substitute imports with domestic production. This appear to happen, for instance, in the Mediterranean region, and to a lower extent in Sub-Saharan Africa. This indirect effect may thus benefit these countries in the long term, by lowering their dependence on food imports.

Thirdly, market opportunities may arise for non traditional exporters, like China and the whole “rest of the Cairns Group” aggregation. As seen in the previous section, this aggregation includes a wide host of countries, ranging from South Africa, to Southern Asian countries, to several Latin America; still the potential advantage for the group as a whole may indicate opportunities for some “non traditional” exporter.

Finally, the relatively large welfare gain that the model calculates for the enlarged EU, especially in the scenarios in which export subsidies are fully eliminated, can be easily related to the very reasons why the reduction/elimination of export subsidies poses so many difficulties to the European policy makers. As seen, much of this benefit arises from an improvement in resource allocation; in turn, this implies a reduction in the European agriculture as a whole, and a migration of resource toward other activities in the economy. To the extent to which the model is predicting accurately these effects, this appears as a reason why European farmers resist the change.

References

- Abare, “Export subsidies in the current WTO negotiations”, *Abare Current Issues*, n° 01.5, July 2001.
- Agra Europe, "Revised Harbinson text cuts no ice in WTO talks", *Agra Europe Weekly*, n° 2046, 21st March, 2003.
- Anderson K. “Agriculture, Developing Countries and WTO Millennium Round”, Centre for International Economic Studies, *Discussion paper* n° 99/28, November 1999.
- Anderson K., Dimaranan B., Francois T., Hoekman B., Martin W., “The Cost of Rich (and Poor) Country Protection to Developing Countries”, Centre for International Economic Studies, *Discussion paper* n° 01/36, September 2001.
- Bonët A., Le Cacheux J, *Desirable and undesirable international effects of agricultural liberalisation in the North*, CATT, CEPIL, OFCE, typescript, 2002.
- Conforti P., De Filippis, F. and Salvatici L. “The Mid-Term Review Of The Common Agricultural Policy: Assessing The Effects Of The Commission Proposals”, paper presented at the at the International Agricultural Trade Research Consortium, 2002 General Meeting, Monterey, California, December 2002
- CAPRI, “The Doha Round of the World Trade Organization: Appraising Further Liberalization of Agricultural Markets”, *Working Paper* 02-WP 317 Food and Agricultural Policy Research Institute, Iowa State University and University of Missouri-Columbia, November 2002.
- Chau N.H, de Gorter H., *Disentangling the Production and Export Consequences of Direct Farm Income Payments*, contributed paper for presentation at the annual meeting of the American Agricultural Economics Association, Tampa Florida, 2 August 2000.
- Diao X., Somwaru A., Roe T., *A Global Analysis of Agricultural Trade Reform in WTO Member Countries*, Economic Development Center, University of Minnesota, Bulletin number 01-1, January 2001.
- Hertel, T. W. (editor) *Global Trade Analysis. Modeling and Applications*, Cambridge University Press, 1997
- Hertel T. W. and Martin W. “Second Best linkages and the gain from global reform of manufactures trade” *Review of International Economics*, 9 (2) 215-32, 2000

- Van Tongeren F. and Van Meijl H. "The Agenda 2000 CAP reform, world prices and URAA GATT_WTO export constraints" paper prepared for the *Third Annual Conference on Global Economic Analysis*, Melbourne, June 27-30, 2000
- Elberhi A., Leetmaa S., *How significant are export subsidies to agricultural trade? Trade and Welfare implications of global reforms*, paper presented as a Selected Paper at the 5th Annual Conference on Global Economic Analysis, June 5-7, Taipei, Taiwan, 2002.
- European Commission, WTO and agriculture: "Harbinson draft won't bridge the gaps" EU Farm Commissioner says, Press Release, 13 February 2003.
- Fransdsen S.E., Jensen H.G., Lind K.M., Melgaard P.P., Yu M., *Note on the Harbinson Draft on Modalities in the WTO Agriculture Negotiations*, Danish Research Institute of Foods Economics, 11th March 2003.
- INEA, *Le Politiche agricole dell'Unione Europea. Rapporto 2001-02*, Settembre 2002.
- Leetma S., "Effects of Eliminating EU Export Subsidies", *Agricultural Policy Reform – The Road Ahead*, Economic Research Service- USDA, AER802, 2001.
- Messerlin P.A., *Agriculture in the Doha Round*, paper prepared for the World Bank Roundtable on "Policy Research in Preparation for the 5th Ministerial", Cairo, May 20-21, 2002.
- OECD, *A Forward-Looking Analysis of Export subsidies in Agriculture*, downloaded from www.oecd.org on data 21 March 2002, 2000.
- Podbury T., Roberts i., Tielu A., Buetre B., *Agricultural Export Measures in WTO Negotiations*, Abare Research Report 01.02, RIDC Publication n° 01.134, 2001.
- Ruiz L., de Gorter H., *The Impacts of Export Subsidy Reduction Commitments in the Agreement on Agriculture*, Department of Ariculture, contributed paper for presentation at the annual meeting of the American Agricultural Economics Association in Tampa, Florida, 2 August 2000.
- Van Meijl J.C.M, Van Tongeren F.W, *Multilateral trade liberalisation and developing countries: A North-South perspective on agriculture and processing sectors*, Agricultural Economics Research Institute (LEI), Report 6.01.07, July 2001.
- Von Braun J., Wonst P. and Grtote Ulrike, "Development Box" and Special and Differential Treatment for Food Security of Developing Countries: Potentials, Limitations and Implementation Issues, ZEF Discussion Papers on Development Policy, Bonn, May 2002.
- Young L.M., Aboott P.C., Leetmaa S., *Export competition: Issues and Options in the Agricultural Negotiations*, IATRC Commissioned paper N° 15, May 2001.
- WTO, *Export Subsidies*, Background paper by the Secretariat, TN/AG/S/8, 2002a.
- WTO, *WTO Agriculture Negotiations: The Issues and where are we now*, on-line document downloaded from www.wto.org on 30th October 2002, 2002b.
- WTO, *Negotiations on Agriculture. Overview*, on-line document downloaded from www.wto.org on 10th January 2003, 2002c.
- WTO, *Negotiations on Agriculture, First Draft of Modalities for the Further Commitments, Revised version* TN/AG/W/1/Rev.1, on-line document downloaded from www.wto.org on 3rd April 2003, 2003.

Table 5. 45% reduction in EU export subsidy expenditure: % changes in supply

	Wheat	Coarse	Paddy	Oilseeds	Milled	Sugar cane &	Refined	Raw	Dairy	Live	Meats	Other food
	grains	grains	rice		rice	beet	sugar	milk		animals		products
Scenario A: baseline 1997												
EU15	-0,8	-2,0	-0,9	0,2	-1,4	-3,9	-5,3	-1,0	-1,3	-0,5	-0,7	-0,01
CEECs	0,2	1,0	0,2	-0,1	0,2	0,4	0,5	0,1	0,4	-0,6	-0,4	-0,03
USA	0,4	0,4	0,0	-0,1	0,2	0,2	0,2	0,4	0,4	0,2	0,2	0,01
Canada	0,6	0,8	0,0	0,0	0,1	0,4	0,5	0,8	1,1	0,1	0,2	0,02
Australia & New Zealand	0,2	0,2	-0,1	-0,2	0,0	0,6	0,6	3,7	4,2	0,4	0,7	-0,14
Brasil	0,1	0,1	0,1	-0,1	0,0	1,0	2,0	0,1	0,1	0,0	0,0	-0,04
Argentina	0,3	0,8	0,0	0,0	0,0	0,0	0,0	0,1	0,2	0,1	0,1	-0,03
Rest of the Cairns Group	0,2	0,2	0,0	0,1	0,0	0,5	0,6	0,4	1,1	0,2	0,2	0,01
Japan	0,3	0,3	0,0	0,2	0,0	0,1	0,1	0,4	0,4	0,1	0,1	0,02
India	0,0	0,0	0,0	0,0	0,7	0,0	0,1	0,0	0,2	0,0	3,8	0,01
Mediterranean countries	0,5	1,2	0,2	0,1	0,3	1,1	2,5	0,7	2,1	0,2	1,1	-0,03
Sub-Saharan Africa	1,0	0,1	0,0	0,1	0,0	1,0	2,2	0,3	6,2	0,1	1,2	0,01
China	0,1	0,1	0,0	0,1	0,0	1,1	2,3	0,1	1,7	0,0	0,2	0,01
Rest of the world	0,4	0,2	0,0	0,0	0,0	0,8	1,4	0,7	1,9	0,3	0,6	0,00
Scenario C: baseline 2010												
EU15	-1,1	-2,4	-1,1	0,2	-1,7	-4,2	-5,8	-0,8	-1	-0,7	-1	0
CEECs	-2,4	-1,4	-0,3	0,5	-0,3	-9,6	-12	0	0	-0,2	-0,8	0,4
USA	0,7	0,4	0	-0,1	0,3	0,2	0,2	0,3	0,3	0,2	0,2	0
Canada	1	1	0	0	0,1	0,5	0,7	0,7	0,9	0,2	0,2	0
Australia & New Zealand	0,6	0,4	0	-0,1	0,1	0,6	0,6	2,8	3,1	0,5	0,8	-0,1
Brasil	0,2	0,1	0,1	-0,1	0	1,4	2,6	0	0,1	0	0	0
Argentina	0,4	1	0,1	-0,1	0,1	0	0	0,1	0,3	0,1	0,2	-0,1
Rest of the Cairns Group	0,3	0,3	0	0,1	0	0,8	0,9	0,3	0,8	0,2	0,2	0
Japan	0,3	0,4	0	0,2	0	0,1	0,1	0,3	0,3	0,1	0,1	0
India	0	0	0	0	0,9	0	0,1	0	0,1	0	4,4	0
Mediterranean countries	0,6	1,5	0,2	0,1	0,3	1,1	2,6	0,6	1,7	0,3	1,2	0
Sub-Saharan Africa	1,4	0,1	0	0,1	0	0,4	0,9	0,3	5,3	0,1	1	0
China	0,1	0,2	0	0	0	1	2,1	0,1	1,2	0	0,2	0
Rest of the world	0,6	0,3	0	0	0	1,2	2,2	0,5	1,2	0,4	0,7	0

Source: Authors' simulation results

Table 6. Elimination of EU export subsidies: % changes in supply

	Wheat	Coarse	Paddy	Oilseeds	Milled	Sugar cane	Refined	Raw milk	Dairy	Live	Meats	Other food
	grains	grains	rice		rice	& beet	sugar			animals		products
Scenario B: baseline 1997												
EU15	-2,2	-4,2	-1,1	-2,5	-1,7	-8,0	-10,7	-1,3	-1,6	-1,1	-1,4	-0,6
CEECs	0,3	1,8	-0,9	-1,3	0,3	-1,1	-1,5	0,5	2,2	-1,3	-0,7	-0,5
USA	0,8	0,6	-0,3	-2,1	0,7	-1,4	-1,4	0,3	0,4	0,3	0,4	-0,3
Canada	1,8	1,6	-0,1	-1,6	0,7	-1,8	-3,7	3,2	4,3	0,3	0,3	-0,6
Australia & New Zealand	3,6	1,4	0,2	-2,5	-0,4	-0,9	-0,9	10,4	11,8	2,0	0,6	0,5
Brasil	1,0	2,8	2,1	10,4	0,2	6,6	12,7	0,2	0,2	-0,8	-0,7	2,8
Argentina	1,7	1,4	2,1	-0,5	1,7	-0,4	-0,4	0,2	1,0	-0,3	-0,1	-0,1
Rest of the Cairns Group	-0,6	0,2	-0,1	-1,5	-0,1	-0,4	-0,5	1,3	3,1	0,7	1,7	-0,2
Japan	-0,3	0,3	0,1	-1,5	0,1	0,6	0,6	1,6	1,9	0,0	0,1	1,0
India	0,0	0,0	0,1	-0,1	2,2	0,0	0,0	0,0	0,5	0,1	6,8	-0,1
Mediterranean countries	0,7	2,3	0,3	-1,2	0,8	1,2	2,4	1,6	5,2	0,4	2,0	0,0
Sub-Saharan Africa	2,0	0,1	-0,1	-0,7	-0,1	0,2	0,4	0,7	15,7	0,2	2,8	-0,2
China	-0,1	0,0	0,0	-1,2	0,0	0,5	1,1	0,3	5,3	0,1	0,7	-0,3
Rest of the world	0,5	0,3	0,1	-2,2	0,0	1,8	3,2	0,2	0,3	0,6	1,3	-0,1
Scenario D: baseline 2010												
EU15	-3,1	-5,1	-1,7	-3,1	-2,1	-8,6	-11,9	0,6	1,1	-1,6	-2	-0,8
CEECs	-5,5	-3,6	-2,1	-1,3	-0,5	-19,6	-24,3	0	0,7	-0,6	-1,7	0,2
USA	1,3	0,7	-0,4	-2,9	0,7	-1,4	-1,4	0,3	0,3	0,3	0,3	-0,5
Canada	2,5	2,1	-0,2	-2	0,5	-1,4	-3,5	3,4	4,5	0,2	0,2	-0,7
Australia & New Zealand	4,8	1,6	0,5	-3,1	-0,1	-0,4	-0,4	9,4	10,5	2	1,1	0
Brasil	2,1	4,4	3,4	12,1	0,2	8	14,7	0,2	-0,1	-0,7	-0,6	4,8
Argentina	1,8	1,8	2,5	-1	2	-0,8	-0,8	0,4	1,8	-0,4	0	-0,4
Rest of the Cairns Group	-0,3	0,4	-0,1	-1,8	-0,1	0	0	1,2	2,8	0,7	1,7	-0,4
Japan	0	0,8	0,2	-2,1	0,1	0,9	0,9	1,8	2,2	0	0,2	1,3
India	0	0	0	-0,1	2,5	0	0	0	0,5	0	8	-0,1
Mediterranean countries	1,1	3	0,3	-1,5	0,8	1,2	2,6	1,5	4,2	0,5	2,2	-0,1
Sub-Saharan Africa	3	0,1	-0,1	-0,7	-0,1	-0,7	-1,1	0,7	13,6	0,2	2,9	-0,2
China	0	0	0	-1,5	0	0,5	0,9	0,2	4,1	0,1	0,7	-0,3
Rest of the world	1	0,4	0,1	-2,5	0,1	2,3	4,5	-2,8	-7,7	0,8	1,8	-0,1

Source: Authors' simulation results

Table 7. 45% reduction in EU export subsidy expenditure: % changes in market prices

	Wheat	Coarse grains	Paddy rice	Oilseeds	Milled rice	Sugar cane & beet	Refined sugar	Raw milk	Dairy	Live animals	Meats	Other food products
Scenario A: baseline 1997												
EU15	-0,18	-0,24	-0,15	-0,12	-0,07	-0,34	-0,12	-0,18	-0,1	-0,15	-0,1	-0,05
CEECs	0,05	0,16	0,03	-0,02	-0,03	0,06	0,15	0,03	0,03	-0,04	0,01	0
USA	0,19	0,16	0,13	0,12	0,06	0,18	0,09	0,12	0,08	0,12	0,09	0,02
Canada	0,14	0,15	0,15	0,13	0,13	0,11	0,04	0,13	0,09	0,14	0,09	0,03
Australia & New Zealand	0,28	0,27	0,25	0,2	0,18	0,38	0,19	0,49	0,32	0,28	0,19	0,13
Brasil	0,11	0,11	0,11	0,1	0,1	0,2	0,14	0,11	0,11	0,11	0,1	0,09
Argentina	0,18	0,32	0,13	0,13	0,09	0,13	0,08	0,16	0,11	0,17	0,13	0,07
Rest of the Cairns Group	0,07	0,12	0,08	0,08	0,06	0,22	0,1	0,09	0,16	0,08	0,07	0,03
Japan	0,04	0,05	0,02	0,04	0,02	0,03	0,08	0,06	0,28	0,09	0,04	0,02
India	0,03	0,03	0,03	0,03	0,04	0,03	0,02	0,03	0,02	0,04	0,03	0,02
Mediterranean countries	0,09	0,17	0,04	0,05	0,03	0,11	0,16	0,1	0,12	0,08	0,1	0,06
Sub-Saharan Africa	0,11	0,04	0,03	0,04	0,02	0,08	0,07	0,06	0,26	0,04	0,03	0,04
China	0,04	0,04	0,02	0,03	0,02	0,22	0,15	0,04	0,02	0,04	0,02	0,02
Rest of the world	0,17	0,14	0,13	0,13	0,1	0,3	0,17	0,2	0,2	0,14	0,14	0,03
Scenario C: baseline 2010												
EU15	-0,12	-0,15	-0,11	-0,16	-0,04	-0,12	-0,06	-0,07	-0,06	-0,07	-0,05	-0,04
CEECs	-0,57	-0,43	-0,86	-0,4	-0,03	-1,3	-0,33	-0,23	-0,19	-0,29	-0,15	-0,15
USA	0,22	0,16	0,13	0,12	0,07	0,19	0,11	0,12	0,08	0,13	0,1	0,03
Canada	0,15	0,16	0,16	0,14	0,14	0,11	0,04	0,13	0,09	0,15	0,1	0,03
Australia & New Zealand	0,27	0,26	0,23	0,19	0,17	0,34	0,18	0,4	0,27	0,25	0,18	0,13
Brasil	0,12	0,11	0,11	0,1	0,1	0,21	0,13	0,11	0,1	0,11	0,1	0,08
Argentina	0,36	0,59	0,23	0,22	0,12	0,23	0,08	0,29	0,13	0,31	0,22	0,08
Rest of the Cairns Group	0,08	0,14	0,09	0,1	0,06	0,28	0,13	0,09	0,13	0,09	0,07	0,03
Japan	0,05	0,07	0,03	0,04	0,02	0,03	0,1	0,07	0,23	0,13	0,05	0,02
India	0,03	0,03	0,03	0,03	0,04	0,03	0,02	0,03	0,02	0,04	0,03	0,02
Mediterranean countries	0,12	0,22	0,05	0,07	0,03	0,12	0,18	0,11	0,12	0,1	0,12	0,07
Sub-Saharan Africa	0,15	0,04	0,03	0,04	0,02	0,06	0,06	0,06	0,26	0,04	0,03	0,04
China	0,05	0,05	0,02	0,03	0,02	0,16	0,11	0,04	0,02	0,04	0,02	0,02
Rest of the world	0,23	0,17	0,14	0,14	0,1	0,39	0,24	0,18	0,17	0,16	0,15	0,04

Source: Authors' simulation results

Table 8. Elimination EU export subsidies: % changes in market prices

	Wheat	Coarse grains	Paddy rice	Oilseeds	Milled rice	Sugar cane & beet	Refined sugar	Raw milk	Dairy	Live animals	Meats	Other food products
Scenario B: baseline 1997												
EU15	-0,77	-0,88	-0,62	-0,99	-0,42	-1,07	-0,52	-0,74	-0,44	-0,69	-0,5	-0,35
CEECs	-0,26	-0,02	-0,63	-0,63	-0,26	-0,56	-0,25	-0,22	-0,18	-0,43	-0,24	-0,27
USA	0	-0,04	-0,14	-0,41	-0,13	-0,32	-0,42	-0,09	-0,08	-0,09	-0,11	-0,19
Canada	0,09	0,08	0,02	-0,12	-0,04	-0,14	-0,15	0,07	0,06	0,03	-0,06	-0,19
Australia & New Zealand	1,39	1,2	1,11	0,72	0,77	1,17	0,65	1,71	1,14	1,17	0,78	0,53
Brasil	4,41	4,56	4,5	5,53	3,7	5,04	4,15	4,36	3,98	4,39	3,96	3,61
Argentina	0,79	0,77	0,84	0,37	0,52	0,38	0,3	0,51	0,44	0,43	0,44	0,33
Rest of the Cairns Group	-0,25	-0,15	-0,28	-0,7	-0,23	-0,34	-0,23	-0,02	0,31	-0,07	-0,11	-0,2
Japan	0,41	0,46	0,47	0,31	0,44	0,5	0,18	0,47	1,43	0,2	0,3	0,33
India	-0,22	-0,23	-0,21	-0,26	-0,22	-0,23	-0,22	-0,24	-0,21	-0,22	-0,22	-0,23
Mediterranean countries	0,09	0,27	0	-0,22	-0,04	0,09	0,16	0,13	0,21	0,08	0,07	0,02
Sub-Saharan Africa	-0,05	-0,21	-0,22	-0,27	-0,21	-0,2	-0,18	-0,17	0,34	-0,2	-0,19	-0,19
China	-0,22	-0,2	-0,22	-0,43	-0,17	-0,11	-0,12	-0,21	-0,12	-0,23	-0,16	-0,23
Rest of the world	0,04	-0,01	-0,03	-0,6	-0,05	0,36	0,05	-0,05	0,22	0,02	0,07	-0,14
Scenario D: baseline 2010												
EU15	-0,51	-0,56	-0,47	-1,12	-0,34	-0,48	-0,35	-0,38	-0,24	-0,37	-0,33	-0,33
CEECs	-1,48	-1,19	-2,54	-1,33	-0,25	-2,91	-0,93	-0,76	-0,66	-0,87	-0,55	-0,61
USA	0,09	-0,01	-0,13	-0,43	-0,09	-0,27	-0,39	-0,07	-0,06	-0,06	-0,09	-0,18
Canada	0,14	0,12	0,05	-0,08	-0,02	-0,06	-0,1	0,1	0,1	0,06	-0,02	-0,18
Australia & New Zealand	1,23	1,02	0,91	0,57	0,65	1,02	0,57	1,44	0,98	0,97	0,66	0,44
Brasil	5,32	5,49	5,4	6,6	4,41	5,93	4,87	5,15	4,66	5,26	4,72	4,32
Argentina	1,17	1,24	1,23	0,3	0,69	0,39	0,32	0,72	0,51	0,56	0,57	0,39
Rest of the Cairns Group	-0,24	-0,16	-0,32	-0,85	-0,26	-0,25	-0,21	-0,07	0,26	-0,11	-0,13	-0,22
Japan	0,49	0,55	0,51	0,27	0,47	0,56	0,2	0,51	1,49	0,27	0,31	0,32
India	-0,19	-0,2	-0,19	-0,23	-0,19	-0,2	-0,19	-0,21	-0,19	-0,2	-0,19	-0,2
Mediterranean countries	0,16	0,38	0,01	-0,28	-0,04	0,11	0,21	0,15	0,21	0,11	0,11	0,03
Sub-Saharan Africa	0,04	-0,24	-0,26	-0,32	-0,24	-0,29	-0,23	-0,19	0,31	-0,22	-0,21	-0,21
China	-0,2	-0,18	-0,21	-0,46	-0,16	-0,13	-0,14	-0,23	-0,12	-0,23	-0,16	-0,24
Rest of the world	-0,03	-0,19	-0,26	-0,93	-0,22	0,23	0,08	-0,64	-0,09	-0,13	-0,01	-0,19

Source: Authors' simulation results

Table 9. 45% reduction in EU export subsidy expenditure: changes in trade balances (million US\$ 1997)

	Wheat	Coarse	Paddy	Oilseeds	Milled	Sugar cane	Refined	Raw milk	Dairy	Live	Meats	Other food
		grains	rice		rice	& beet	sugar			animals		products
Scenario A: baseline 1997												
EU15	-98,7	-183,5	2,4	16,9	-22,1	0,3	-494,0	0,8	-694,7	24,0	-278,2	146,4
CEECs	-0,1	16,2	0,0	-0,3	1,7	0,0	4,9	-0,1	9,8	-14,3	-13,7	-22,4
USA	44,3	96,9	-0,2	-2,1	2,9	0,0	3,5	-0,1	121,4	-4,0	90,8	75,8
Canada	30,1	17,7	0,0	-0,5	-0,2	0,0	0,3	0,0	38,1	1,0	10,1	-4,9
Australia & New Zealand	11,6	3,2	-0,2	-0,3	0,1	0,0	14,3	0,0	318,2	-2,7	62,5	-116,1
Brasil	-0,4	2,5	-0,2	-2,3	-0,2	0,0	191,0	0,0	6,0	-0,1	3,0	-84,8
Argentina	12,4	30,5	0,1	-0,8	0,5	0,0	0,6	0,0	13,4	0,0	9,0	-24,0
Rest of the Cairns Group	-1,4	2,6	-0,2	-0,7	4,0	0,0	55,8	0,0	30,9	0,7	10,8	27,0
Japan	-2,3	-9,8	0,0	-3,4	0,3	0,0	-0,8	0,0	1,0	-0,5	3,0	158,8
India	0,5	0,3	-0,7	0,6	6,7	0,0	8,8	0,0	1,8	0,0	7,0	5,2
Mediterranean countries	8,7	9,0	0,0	-0,8	0,4	0,0	113,4	-0,2	35,9	-2,7	35,3	-33,9
Sub-Saharan Africa	1,3	3,1	0,0	0,4	0,9	-0,1	15,5	0,0	6,2	0,0	3,7	-3,2
China	0,6	11,5	0,1	0,8	2,1	0,0	14,5	0,0	8,7	0,2	4,3	38,5
Rest of the world	-3,7	13,4	-0,9	-5,4	4,3	-0,2	98,2	-0,3	133,5	-0,6	79,7	-111,4
Scenario C: baseline 2010												
EU15	-172,6	-278,03	6,33	26,4	-30,51	1,69	-589,3	1,29	-825,17	13,14	-432,89	-0,2
CEECs	-51,35	-34,63	0,01	4,26	-5,31	0,43	-217,9	0,98	-5,88	3,36	-31,56	330,15
USA	83,58	142,45	-0,45	-3,33	3,77	-0,02	5,78	-0,09	132,19	-6,91	122,88	56,93
Canada	53,68	27,89	-0,03	-0,76	-0,3	0,01	0,51	-0,04	49,54	1,24	15,32	-18,23
Australia & New Zealand	25,38	7,79	-0,16	-0,26	0,34	-0,01	17,79	-0,04	344,09	-2,24	83,68	-116,48
Brasil	1,04	4,94	-0,25	-4,8	-0,22	-0,01	331,61	-0,01	3,05	-0,12	7,69	-136,25
Argentina	37,56	71,71	0,03	-4,51	1,58	0	2,46	-0,01	23,47	-0,73	27,88	-69,6
Rest of the Cairns Group	-1,85	9,01	-1,02	-1,24	9,07	-0,01	118,52	-0,06	42,59	0,66	18,23	43,48
Japan	-3,4	-15,29	-0,01	-4,65	0,8	0	-0,92	-0,02	3,16	-0,74	4,82	329,66
India	1	0,53	-1,52	0,74	9,14	0,04	13,45	-0,09	2,36	0,02	8,54	6,23
Mediterranean countries	25,31	20,71	-0,08	-1,31	0,15	-0,02	147,2	-1,13	50,89	-4,17	53,25	-84,75
Sub-Saharan Africa	2,5	5,83	-0,16	0,42	1,86	-1,74	-7,43	-0,02	12,71	-0,19	6,42	-8,49
China	2,01	24,58	-0,05	1,3	3,01	0	20,95	-0,04	9,89	0,32	6,34	47,51
Rest of the world	6,13	44,52	-2,06	-9,32	8,14	-0,42	213,17	-0,72	164,62	-3,47	153,2	-293,38

Source: Authors' simulation results

Table 10. Elimination EU export subsidies: changes in trade balances (million US\$1997)

	Wheat	Coarse grains	Paddy rice	Oilseeds	Milled rice	Sugar cane & beet	Refined sugar	Raw milk	Dairy	Live animals	Meats	Other food products
Scenario B: baseline 1997												
EU15	-224,4	-393,1	4,2	-15,7	-37,6	0,7	-1141,5	0,8	-1004,8	20,0	-620,1	-6770,9
CEECs	0,5	35,6	0,2	-13,2	4,1	0,1	-21,6	-0,6	60,7	-38,3	-30,1	-339,2
USA	85,4	199,8	-2,1	-372,1	11,4	0,1	-12,0	0,0	106,5	-17,5	195,5	-2439,5
Canada	73,1	35,6	0,0	-63,7	0,3	0,0	-0,7	-0,2	132,0	1,3	16,4	-670,2
Australia & New Zealand	81,0	8,2	0,6	-9,4	-1,3	0,0	-27,1	-0,1	942,5	52,8	68,9	210,9
Brasil	-82,9	16,3	-12,3	604,0	-5,9	-0,1	843,1	0,0	-11,4	-12,5	-53,2	4484,5
Argentina	73,8	56,3	2,7	-26,6	14,4	0,0	-5,5	0,0	65,5	-1,6	-5,4	-49,0
Rest of the Cairns Group	-1,2	6,6	-1,3	-9,9	-14,6	0,0	-28,4	-0,1	81,3	-12,3	162,8	-598,6
Japan	-12,3	-28,9	-0,7	1,9	0,0	-0,1	-2,8	-0,4	-1,4	0,3	-9,6	6557,5
India	-0,7	0,6	-3,8	-15,9	17,6	-0,1	0,9	-0,3	6,1	-0,2	11,8	-100,7
Mediterranean countries	8,9	20,4	-0,7	-14,1	6,5	-0,1	141,0	5,7	88,8	14,9	77,6	135,2
Sub-Saharan Africa	4,9	6,2	0,0	-11,5	-1,7	-0,1	-12,4	-0,1	18,9	-1,6	8,9	-142,3
China	1,9	20,9	-0,7	-18,7	5,8	0,0	13,1	-0,1	27,9	-0,6	9,5	-596,3
Rest of the world	-4,3	35,6	12,8	-71,6	4,9	-0,4	255,3	-4,6	-342,0	-9,2	209,5	-357,5
Scenario D: baseline 2010												
EU15	-400,1	-603,1	8,5	-27,8	-47,5	3,5	-1361,5	-2,1	426,7	-21,8	-988,0	-13368,3
CEECs	-117,1	-84,2	0,3	-24,0	-6,9	0,7	-512,8	0,5	16,3	2,8	-70,4	345,8
USA	174,1	298,3	-3,0	-544,0	11,9	0,1	-10,8	0,0	105,5	-21,0	246,4	-3718,3
Canada	121,3	55,5	0,0	-88,4	0,2	0,0	3,7	-0,3	202,2	1,1	14,1	-825,0
Australia & New Zealand	136,2	19,4	0,7	-12,0	-0,3	0,0	-15,8	-0,2	1210,5	49,2	117,3	-87,2
Brasil	-147,8	24,5	-20,7	910,5	-15,6	-0,1	1294,4	0,8	-38,3	-16,0	-68,3	10569,9
Argentina	163,5	140,8	5,5	-80,3	22,3	0,0	-14,1	-0,1	127,8	-7,1	18,2	-359,8
Rest of the Cairns Group	2,6	22,4	-1,2	-21,7	-13,6	0,0	37,3	-0,5	138,9	-9,0	224,7	-1593,9
Japan	-23,7	-53,3	-0,8	4,8	0,6	-0,1	-4,4	-0,4	14,1	-0,3	-6,2	10637,7
India	-0,5	1,1	-6,7	-26,9	22,3	0,0	7,9	-1,9	9,8	-0,2	15,0	-152,6
Mediterranean countries	45,6	48,8	-0,7	-23,4	7,4	-0,1	174,7	21,9	135,9	29,8	118,9	-18,1
Sub-Saharan Africa	10,2	11,7	-0,3	-16,5	-12,4	-3,6	-98,4	-0,2	37,9	-2,2	20,1	-262,6
China	5,2	43,3	-1,7	-46,1	7,8	0,0	22,9	-0,6	35,9	-1,1	14,3	-1033,0
Rest of the world	48,4	127,7	18,5	-94,2	28,5	-0,6	500,4	-16,7	-2255,0	-10,3	412,7	-1481,6

Source: Authors' simulation results

Table 11. 45% reduction in EU export subsidy expenditure: welfare changes

	Scenario A: baseline 1997			Scenario C: baseline 2010		
	allocative efficiency	terms of trade	Total	allocative efficiency	terms of trade	Total
EU15	1008,6	705,8	1756,4	1144,2	857,7	1962,5
CEECs	-66,1	-16,2	-91,5	306,8	149,9	422,5
USA	-110,1	47,9	-76	-144,9	38,3	-100,9
Canada	-39,1	19,6	-21,3	-48	23,5	-24,9
Australia & New Zealand	-12,1	99,4	86,4	-13,3	102,1	79
Brasil	38,7	38,8	89,5	47	70,8	151,6
Argentina	2,3	17,7	21,4	1,9	80,4	89,5
Rest of the Cairns Group	-34,7	-21,9	-60	-43,3	-6,5	-47,7
Japan	-81,2	-55	-146,4	-73,2	-91,7	-144,7
India	-3,8	4,9	-0,3	-3,9	11,4	9
Mediterranean countries	-305,7	-356,9	-664,1	-419,2	-513,1	-934,4
Sub-Saharan Africa	-31	-83,3	-113,8	-53,9	-144,4	-197,4
China	-15,5	-3	-22,3	-25,7	14,5	7,9
Rest of the world	-434,7	-397,7	-840,9	-587,9	-592,7	-1183,2
Total	-84,3	0,2	-82,7	86,6	0,2	88,7

Source: Authors' simulation results

Table 12. Elimination EU export subsidies: welfare changes

	Scenario B: baseline 1997			Scenario D: baseline 2010		
	allocative efficiency	terms of trade	Total	allocative efficiency	terms of trade	Total
EU15	2020	2016,7	4061	2003,1	2021,7	3664,9
CEECs	-119,9	68,8	-70,5	632,7	495,2	1049,8
USA	-75	463	297,1	-61,5	868,9	581,4
Canada	-146,9	16,5	-145,8	-176,7	157,7	-70,3
Australia & New Zealand	7,5	266,6	268,1	5,4	323	249,4
Brasil	1880,8	-624,8	1992,1	3138,6	-794,2	4698,4
Argentina	-2,9	8,3	24,5	-36,6	524,7	601,8
Rest of the Cairns Group	40,3	-150,4	-132,9	-10	-516,9	-594,5
Japan	384,2	-700,7	-859,7	607,2	-710,5	-1419,5
India	18,5	-4	5,3	19,3	-20,9	-35,8
Mediterranean countries	-400,2	-481,3	-877,4	-565,7	-775,7	-1269
Sub-Saharan Africa	-56,4	-183	-238,1	-100,8	-335,6	-439,1
China	344,2	124,8	421	802,1	150,3	713,9
Rest of the world	-428,7	-806,2	-1295	288,6	-1368,1	-1230,9
Total	3465,4	14,4	3449,6	6545,6	19,5	6500,4

Source: Authors' simulation results