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The Future Common Agricultural Policy of the EU: Consequences for Non-EU regions

Birgitte Gersfelt* and H. G. Jensen**

*Danish Research Institute of Food Economics - The Royal Veterinary and Agricultural University, Denmark and University of Copenhagen, email: bg@foi.dk

**Danish Research Institute of Food Economics - The Royal Veterinary and Agricultural University, Denmark, email: hans@foi.dk

Abstract

The European Common Agricultural Policy (CAP) is scheduled to undergo major changes in the coming years, as the EU is enlarged with ten new member countries and the Mid-term Review (MTR) of the CAP is implemented. These changes will obviously have significant impacts on European agriculture, but how will they affect other countries?

The purpose of this paper is to provide a quantitative assessment of the impact these reforms will have on non-EU countries, focusing particularly on implications for trade, production, and welfare. The analysis is conducted using a CAP specific version of the GTAP model and an adjusted version 5 of the GTAP database.

The analysis is based on a baseline for 1997-2013. Two scenarios are then analyzed to illustrate the effects of the Eastern Enlargement and the MTR-reform on non-member regions. The first scenario features the Eastern Enlargement of the EU under the new MTR-reformed CAP thus capturing the future realities in European agriculture. However, in order to decompose the results from this scenario, a second scenario is constructed featuring an Eastern Enlargement of the EU under the old Agenda 2000 CAP. Comparing the results from these two scenarios subsequently allows us to distinguish between implications deriving from the Eastern Enlargement, such as trade diversion effects, and outcomes attributable to the MTR-reform, such as the trade effects derived from decoupling of the EU direct payments.

The analysis shows that the Eastern Enlargement and the MTR-reform do have significant impacts on EU agricultural production as for instance the decoupling of direct payments under the MTR-reform results in a significant reduction in the European production of cereals and bovine animals, while the introduction of milk quotas in the new EU member countries results in a reduction in raw milk production. The changes in EU agricultural production are subsequently reflected in EU trade with non-EU regions, but the derived effects on agricultural production in non-EU regions are generally minor. Finally the analysis also shows that the impacts on welfare in non-EU regions are negligible, all in all making the Eastern Enlargement and the MTR-reform primarily a European matter.

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1. Introduction.

The Common Agricultural Policy (CAP) of the European Union has traditionally attracted substantial criticism from EU trading partners for its distortionary effects on EU agricultural production and the derived consequences these distortions have for the international agricultural markets. After a series of reforms over the last decade – starting with the 1992 MacSharry reform and continuing with the Agenda 2000 reform – the CAP now faces a new set of reforms of significant magnitude. First of all, the Eastern Enlargement of the EU, which will take place in 2004, implies an extension of the CAP domain to include the ten new EU member countries. Secondly, the so-called Mid-Term Review of the CAP, which will be implemented from 2004 onwards, entails wide-ranging reforms of some of the CAP policy instruments. Both of these reforms will have consequences for agricultural production in the new, enlarged EU, and international trade will spread these changes to the EU's trading partners. The question is then: how will the agricultural sectors in the non-EU regions be impacted, and will the European reforms prove beneficial or detrimental to these regions?

The present paper seeks to answer these questions through quantitative analysis based on the global general equilibrium model GTAP. The analysis is carried out in a modified version of the GTAP model where special attention has been given to the modeling of the CAP. The paper will primarily focus on the impacts on the agricultural sectors, outlining the consequences for the European supply response and the derived impact on EU trade with non-EU regions, as well as the ensuing supply response in these non-EU regions and the overall welfare implications. However, before turning to the quantitative analysis a brief introduction will be given of the agricultural aspects of the Eastern Enlargement and the MTR-reform.

2. The Eastern Enlargement of the EU.

On December 13, 2002 a historic agreement was reached at the European Council meeting in Copenhagen: On May 1, 2004 eight Central and Eastern European Countries (Poland, Hungary, the Czech Republic, the Slovak Republic, Estonia, Latvia, Lithuania, and Slovenia) as well as Cyprus and Malta will accede to the EU in the so-called Eastern Enlargement.

Accession to the EU will have significant consequences for the agricultural sectors in the ten accession countries. The remaining border protection between the existing and the new

members will be removed, and the new member countries will adopt the same level of border protection against third countries as that existing in the EU. The latter implies that some accession countries will have to raise existing tariffs on certain commodities significantly, while other accession countries will have to lower their tariffs on various commodities (cf. Jensen and Frandsen 2003a). Thus in some cases the Eastern Enlargement will reduce third countries' access to accession country markets, while in other cases it will – ceteris paribus - enhance access to these markets.[1]

CAP market measures such as the intervention price system and the export subsidies will be extended to the new member countries from day one.[2] Naturally these measures are also accompanied by an extension of the EU production quota system to the new member countries. Direct payments in the form of area and animal premium will also be extended to the new member countries, but these will be phased in over a period of 10 years (cf. European Commission 2002). Furthermore, due to a simplified implementation scheme in the initial years as well as the ensuing MTR-reform, the majority of the premia in the new member countries will be decoupled from production.

The extension of the CAP to the new member countries will obviously be costly. However, in October 2002 the EU leaders agreed on a financial framework, which stabilizes EU spending on CAP expenditures in the period up to 2013 (the so-called Schroeder-Chirac deal). The total expenditures on market measures and direct payments in the enlarged EU comprised of 25 countries (henceforth EU25) will consequently be bounded by this financial framework.

3. The MTR-reform of the CAP.

On July 10, 2002 the European Commission presented its proposal for the so-called mid-term review (MTR) of the CAP, and after a year of tough negotiations over this proposal, the European Council finally agreed on how to reform the CAP in June 2003.

[1] The EU's Everything But Arms initiative (EBA), which entails a non-reciprocal removal of all EU restrictions on imports (except import of arms) from Least Developed Countries (LDCs) (cf. Yu and Vig Jensen 2003), will also apply in the new member countries after the enlargement. Thus LDCs' access to accession country markets will improve following the Eastern Enlargement.

[2] Except in the case of export subsidies to sugar, where special rules apply (cf. Jensen and Frandsen 2003a)

The final MTR-reform is comprised of five main elements (cf. Jensen and Frandsen 2003b):

- Continuation of the Agenda 2000 approach to revisions of the market measures for certain commodities.
- Decoupling of direct support by introduction of a single farm income payment based on historical reference of payment.
- Introduction of cross compliance through reduction of direct payments in case of non-compliance with EU standards regarding environment, food safety, animal health and welfare.
- Strengthening of rural development by enhancement of rural development instruments to meet new standards and by redistribution of funds from 1st to 2nd pillar of the CAP (so-called modulation).
- Introduction of a financial discipline mechanism to ensure that the CAP expenditures do not exceed the financial framework.

The continuation of the Agenda 2000 approach to revisions of the market measures entails a reduction of the intervention prices for a number of commodities, in some cases coupled with increases in the direct support payments for these commodities[3]. In the case of dairy products, the intervention price for butter will be reduced by 25 percent (which is an additional 10% price cut compared to the Agenda 2000 reform), while intervention prices for skimmed milk powder will be lowered by 15 percent (as agreed in the Agenda 2000 reform). The price reductions are compensated through introduction of a direct payment per ton of milk quota from 2004 and onwards. Milk quotas are to be maintained to 2014/15 (with an increase in the quotas for Greece and Portugal). For cereals on the other hand, there will be no change in the intervention price, but the monthly increments are reduced by 50 per cent. The area premium for cereals (as well as oilseeds, protein, and set-aside) remains unchanged.

The most radical and innovative feature of the MTR-reform is no doubt the decision to decouple some of the direct support payments from production.[4] This is done by replacing

[3] Minimum producer prices (intervention prices) are guaranteed to producers for certain agricultural produce in the EU, through a combination of sales at floor prices to a buffer stock agency and measures taken at the border. Lowering of the intervention price reduces the floor price at which stock agency starts purchasing. Direct support payments are given to farmers as compensation for reductions in intervention prices.

[4] The theoretical concepts of coupled and decoupled support refer to how closely the amount of support is linked to the size of current production. Fully coupled support entails a direct link between the size of current production and the amount of support (the typical example being price support), whereas fully decoupled support means that the amount of support is completely independent of current production (the typical example being

most of the previous area and animal premia (including the premia for cereals, oilseeds, and protein crops, as well as the premia for beef, veal, sheep, goats, and milk) with a single decoupled farm income payment from 2005 (in the case of milk 2006/07) onwards. The single farm payment is tied to the land, but the land can be used for any agricultural activity – save for certain exceptions regarding production of fruit, vegetables, and table potatoes – as long as it is maintained in good agricultural condition.[5]

The decoupling scheme covers the majority of the direct support premia, and if implemented fully it would have significant consequences for EU agricultural production. However, the member states are granted some discretion regarding the extent of decoupling, as they are allowed to opt for a partial implementation of the decoupling scheme in the following ways:

- Retain 25 per cent of the hectare premium or alternatively up to 40 per cent of the supplementary durum wheat aid.
- Retain up to 50 per cent of the sheep and goat premia.
- Retain up to 100 per cent of the suckler cow premium and up to 40 per cent of the slaughter premium or instead retain either up to 100 per cent of the slaughter premium or alternatively up to 75 per cent of the special male premium component.
- Make additional payments for the purposes of encouraging specific types of farming which are important for the protection or enhancement of the environment and improving the quality and marketing of agricultural products.

The direct payments are also affected by another one of the main elements in the MTR-reform. Modulation entails a percentage reduction in the individual farm's direct payments after allowing for a franchise of 5000 €. The saved funds will be used for rural development measures. As modulation affects all direct support payments this specifically also entails a reduction in the product specific direct support payments.

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direct support payments, which solely depend on historical production in a fixed reference period, and hence do not require any current production) (cf. also Frandsen et al 2003).

[5] The exact restrictions on the production of fruit and vegetables and table potatoes depend on whether the single farm payment is implemented according to the Fischler model or the regional model. Under the former model the farmer cannot receive the single farm payment on land used for growing of these crops, whereas under the latter model the farmer may receive the single farms payment on land used for the production of these crops, provided that the total amount of land used for production of fruit and vegetables and table potatoes does not exceed the amount of land used for production of these crops in the reference period. Whether this regional model will constrain the production of fruit and vegetables and tables potatoes in reality depends on how the restrictions are administered and how the yields for these crops develop (cf. Vig Jensen and Frandsen 2003).

4. Modeling the Future Common Agricultural Policy

In order to empirically investigate the impact of the Eastern Enlargement and the MTR-reform on non-EU regions, we incorporate these policy initiatives into the global CGE model and database known as the Global Trade Analysis Project (GTAP).[6] The GTAP model and database are specifically tailored to the analysis of global trade issues, and our analysis is based on an explicit representation of the CAP in this model, where all the EU-25 member countries are individually represented.

The GTAP model is a standard multi-regional, static computable general equilibrium (CGE) model and like any other applied model it is of course based on specific assumptions regarding the theoretical structure as well as the specific parameters and data used. Regional production is thus produced according to a constant return to scale technology in a perfectly competitive environment, and the private demand system is represented by a non-homothetic demand system (a Constant Difference Elasticity function). The present analysis consequently disregards features such as imperfect competition and increasing returns to scale although these features may be important in certain sectors. The foreign trade structure is characterized by the Armington assumption implying imperfect substitutability between domestic and foreign goods.

The present analysis is based on version 5 of the GTAP database (with 1997 as the base year) and a CAP specific version of the GTAP model. The model and database are used for running three simulation scenarios.

The first simulation is a baseline for the period 1997-2013, which provides us with an updated database that subsequently serves as the benchmark against which the impacts of the Eastern Enlargement and the MTR-reform are measured. The baseline features projections of the world economy and incorporates the effects of changes in the CAP as outlined in the Agenda 2000 reform, the Everything But Arms' initiative (EBA),[7] and the EU preferential market access for bovine meat products and other meat products from the Accession Countries (cf. Baker 2002).

[6] References for the GTAP model and database are Hertel 1998 and Dimaranan et al 2002. The model is solved using GEMPACK (Harrison and Pearson 1996)

[7] The EBA initiative is modelled in the baseline period by reducing all EU tariff rates to zero on imports from Malawi, Mozambique, Tanzania, Zambia, Uganda and the two GTAP aggregate regions Other Southern Africa and the Rest of Sub-Saharan Africa. For an evaluation of the EBA initiative see Yu and Vig Jensen (2003)

The impacts of the Eastern Enlargements and the MTR reform are then analyzed in two scenarios which are build on the updated database for the year 2013. The first of these scenarios – named the "Agenda 2000 scenario" - illustrates the effects of enlarging the EU under the current CAP regime of Agenda 2000. While this is not a realistic scenario, it facilitates a decomposition of the results from the second scenario – the so-called MTR-scenario) – which illustrates the effects of enlarging the EU *and* reforming the CAP in accordance with the MTR-reform.

Both scenarios thus entail the integration of the ten new member countries into the EU and the CAP in the year 2013. Enlargement of the EU implies that all tariffs and export subsidies as well as non-tariff barriers between the EU and the new members countries are abolished. At the same time all sectors in the new member countries are given the same level of protection against third countries as that found in the EU at the time of accession. As previously mentioned, this implies that import tariffs in all the new member countries will change for almost all agricultural commodities – and often significantly so. Export subsidies are also introduced for certain agricultural commodities.

In terms of domestic support, the expansion of the CAP to the new member countries follows the outlines for domestic support relating to direct payments, production quotas and other supply management instruments, which were laid down by the Copenhagen Agreement. In our analysis the new member countries will consequently receive 100% of the CAP direct payment level, as these payments will be fully phased in the year 2013. The baseline as well as the specific changes in tariffs and export subsidy rates and outlines for domestic support is fully documented in Jensen and Frandsen 2003a and 2003b.

In the Agenda 2000 scenario there are no further changes to the CAP than those implied by the enlargement of the EU with the ten new member countries (although the budgetary ceiling from the Schroeder-Chirac deal is observed). One implication of this is that the domestic support payments, which are introduced in the new member countries, will be coupled to current land use and livestock production in this scenario.

In the MTR-scenario on the other hand, the CAP is reformed in accordance with the stipulations of the MTR-reform. First of all, this entails a number of adjustments to the market

measures for certain commodities. The supplementary durum wheat payments are consequently reduced to 285 €/ha in traditional areas and 0 €/ha in well-established areas. Rice and dairy intervention prices are also reduced (modeled as import tariff/export subsidy reductions), and direct payments to rice as well as dairy premiums and additional payments to milk producers are increased. Milk quotas in Portugal and Greece are also expanded.

Second – and more importantly – the domestic support payments are decoupled in the MTR-scenario in accordance with the rules laid out in the MTR-agreement. However, as outlined in the previous section, EU-members will have a certain amount of discretion in the implementation of the MTR-reform, which means that we have had to make specific assumptions about how to model the MTR-reform implementation in each member country. In order to make the scenario as realistic as possible, we have based these assumptions on the political debates in each member country about the options for decoupling direct payments. This has resulted in the following assumptions:

TABLE 1: Coupling/decoupling assumptions for domestic support in the MTR-scenario.

	Cattle	Sheep/Goat	Durum wheat	Hectare premiums
France	100% veal slaughter premiums 100% suckler cow and 40% slaughter premiums given to bulls, steers cows and heifers from the age of eight months	50% coupling	D	25% coupling
Denmark	75% coupling of special male premium	50% coupling	D	D
Portugal	100% coupling of suckler cow and 40% coupling of slaughter premiums	50% coupling	D	D
Finland	75% coupling of special male premium	50% coupling	D	D
Greece	D	50% coupling	40% coupling	D
Italy	100% coupling of slaughter premiums	D	40% coupling	D
Spain	100% coupling of suckler cow and 40% coupling of slaughter premiums	D	40% coupling	D
Austria	100% coupling of suckler cow and 40% coupling of slaughter premiums	D	D	D
Belgium/Luxembourg	100% coupling of veal slaughter premiums	D	D	D
Germany	100% coupling of veal slaughter premiums	D	D	D
Netherlands	100% coupling of veal slaughter premiums	D	D	D
Sweden	75% coupling of special male premium	D	D	D
Ireland		Full decoupling		
UK		Full decoupling		
All accession countries		Full decoupling		

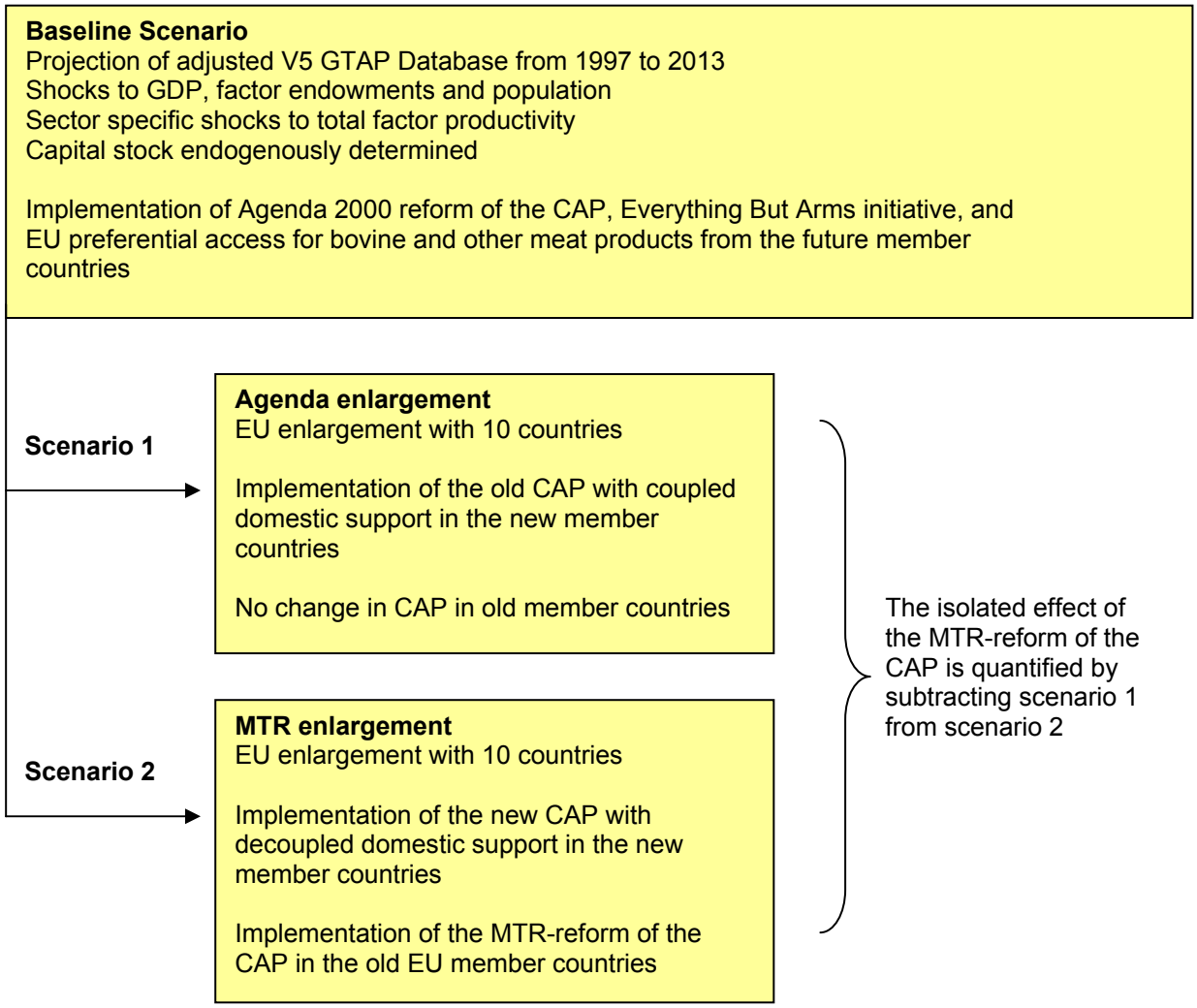
Note: D is equal to 100 percent decoupling of payments.

The decoupled payments of the MTR-reform are modeled by converting direct aid payments in each member country into a uniform hectare payment given to all utilized agricultural area. The results in this chapter consequently illustrate the situation where direct support is decoupled from production without enforcement of any restrictions on land use. Furthermore, all direct payments have been reduced in accordance with MTR-stipulations on modulation,

and the amounts saved have been reallocated to rural development following the MTR-guidelines (cf. Jensen and Frandsen 2003b). [8]

Summing up, the Agenda 2000 enlargement scenario thus illustrates the effect of enlarging the EU with the ten new member countries without reforming the CAP, whereas the MTR enlargement scenario shows the effect of enlarging the EU with ten countries while also reforming the CAP in accordance with the MTR agreement.

Figure 1: Experimental design



This is illustrated in figure 1, which outlines the experimental design adopted in the analysis. As shown in figure 1, the pure effect of the MTR-reform in an enlarged EU may be derived

[8] In the present analysis, the distribution of direct payments within each class of payment (<= 5000, > 5000 €), aggregated to country level for the old EU-15 members countries, is based on working document n° 12 from the Council Working Party (Council of the European Union 2003). From this data, aggregate national rates of reduction have been calculated and used to modulate direct payments.

by comparing the MTR-scenario results with the Agenda 2000 scenario results, as any difference between these two sets of results can be attributed to the MTR-reform. It should be noted that the scenario of primary interests is the "realistic" MTR-enlargement scenario, whereas the Agenda 2000 scenario is simply an auxiliary scenario, which allows us to decompose the results in the MTR-enlargement scenario. In the following sections the primary focus will thus be on the MTR-scenario, while the Agenda 2000 scenario will be included when decomposition of the MTR-scenario results is desirable.

5. Results for production in EU25.

As the effects of the Eastern Enlargement and the MTR-reform on non-EU regions will be derived from the impacts on EU25 production, the starting point for the analysis is European supply response in the MTR-scenario.

TABLE 2. Change in volume of production in EU25, baseline 2013 = index 100

		Contribution from				Contribution from	
	MTR scenario	Enl.	MTR		MTR scenario	Enl.	MTR
Primary agricultural commodities	*Index*	*Change in index*		*Secondary agricultural commodities*	*Index*	*Change in index*	
Cereals (incl. rice)	94.3	1.5	-7.2	Bovine meat products	95.7	0.1	-4.4
Vegetables, fruit, and nuts	103.4	-1.0	4.4	Other meat products	99.7	-0.6	0.3
Oilseeds	99.6	0.1	-0.4	Vegetables, oils, and fat	99.4	-0.5	-0.1
Sugar cane and beet	99.9	-0.4	0.3	Dairy products	97.2	-1.6	-1.2
Plant-based fibers	97.9	-3.5	1.4	Sugar	100.0	-0.1	0.1
Other crops	103.3	-2.0	5.2	Other processed foods (incl. rice)	100.1	0.1	0.0
Bovine animals	93.6	-0.4	-5.9	Beverages and tobacco	99.0	-1.1	0.1
Other animals	100.4	-0.4	0.8				
Raw milk	94.8	-4.3	-0.9	*Other commodities*			
Wool	106.2	-2.5	8.7	Natural resources	99.9	-0.1	0.0
				Textiles/wearing apparel	103.5	3.5	-0.1
				Manufactures	100.2	0.1	0.1
				Services	100.0	-0.1	0.0

The first column of results in table 2 show the aggregate supply response for EU25 in the MTR-enlargement scenario, while the second and third column of results show the decomposition of this supply response in terms of which amount of the supply change is attributable to the enlargement and which amount is attributable to the MTR-reform.[9] In the

[9] It should be noted that since the MTR-effect is defined as the difference between enlarging the EU under the old Agenda 2000 CAP and enlarging it under a new MTR-reformed CAP, the MTR-effect not only captures the liberalization gains from undertaking the MTR-reform in the old EU15, but also the effect of going from Agenda 2000 to the new MTR-CAP in the new member countries. Since the Agenda 2000 CAP will not actually be

case of cereals, for instance, the joint effect of the enlargement and the MTR-reform result in a 5.7 percent reduction in the volume of cereal production. Decomposing this result shows that an Eastern Enlargement under the Agenda 2000 CAP would result in a 1.5 percent increase in cereal production, while a subsequent MTR-reform in the enlarged EU would bring about a 7.2 percent reduction in cereal production (relative to the baseline level). In total the realistic MTR-enlargement scenario will thus result in a 1.5 + (-7.2) = -5.7 percent reduction in cereal production.

Table 2 clearly illustrate the rather dramatic effects of the Eastern Enlargement and MTR-reform on some of the important commodity groups like cereals, bovine animals, and raw milk, as the volume of production of these commodities decline by respectively 5.7, 6.4, and 5.2 percent. The decomposition shows that in the case of cereals and bovine animal production these declines are primarily a result of the MTR-reform. It is not surprising that decoupling of the cereal area premia and the bovine animal premia under the MTR-reform leads to a significant decline in the production of these commodities. It may though seem strange that an extension of the old and coupled Agenda 2000 CAP to the new member countries apparently would not result in large increases in the production of cereals and bovine animals, despite the prevalence of partially coupled support for these commodities under Agenda 2000. However, the aggregate EU25 response conceals the fact that production of these commodities in the new member countries would indeed increase under an Agenda 2000 enlargement, but at the same time cereal and bovine animal production would decrease slightly in the existing EU member countries resulting in minor or non-existing effects on aggregate production.

In the case of raw milk the decline in production in the MTR-enlargement scenario is primarily attributable to the enlargement effect. This is due to the fact that extension of the CAP to the new member countries also entails the introduction of milk quotas in these countries. These quotas are binding in all the new member countries and lead to an overall reduction in their raw milk production of 35 percent, which results in total EU25 production of raw milk declining by 5.2 percent. The reason why the MTR-reductions in intervention prices and decoupling of direct payments to milk only results in an additional 0.9 percent drop

implemented in the new member countries, the MTR-effect may tend to be overestimated if the pre-accession agricultural policies of the new member countries were less distortionary than the Agenda 2000 CAP policies. However, many of the new member countries had established distortionary agricultural policy regimes prior to the enlargement, and for these countries the MTR-reformed CAP will entail a significant degree of liberalization.

in raw milk production is that the milk quotas continue to be binding in most countries after the implementation of the MTR-reform (cf. Jensen and Frandsen 2003b).

While decoupling under the MTR-reform pulls resources out of the sectors, which used to receive coupled direct payment, it also pushes resources into sectors, which were previously unsupported or which continue to receive coupled support, as these sectors have become relatively more profitable following the decoupling under the MTR-reform. The MTR-enlargement scenario consequently shows an increase in the production of e.g. other crops and vegetables, fruits, and nuts of respectively 3.3 and 3.4 percent. However, it should be noted that our modeling of the MTR-reform builds on the assumption that there will be no restrictions on the use of agricultural land receiving the single farm payment (which is, however, not the intent of the MTR-reform when it comes to production of vegetables, fruit, and nuts cf. section 3). Should these restrictions on area use be enforced, our analysis will then tend to overestimate the expansionary effect in the vegetables, fruit, and nuts sector. However, the analysis does show that the MTR-reform will increase the incentives to produce these commodities, and if the area restrictions are not stringently enforced, EU25 production will indeed increase.

Summing up, the EU25 supply response in the MTR-enlargement scenario strongly reflects the impact of the decoupling scheme (although the results for raw milk production are driven primarily by the enlargement effect). The changes in the composition of EU25 agricultural production are therefore characterized by shifts away from sectors, which used to receive coupled direct payments (e.g. cereals and bovine animals), and into sectors, which were previously unsupported or remain unreformed (e.g. other crops and vegetables, fruits, and nuts). And these changes in EU production patterns do not merely affect EU members themselves; they are also exported to non-EU regions through these regions' trade with the EU25.

6. Trade with non-EU regions

How the changes in the EU25 agricultural production composition will affect non-EU regions depend on how they affect the EU export and import patterns. In order to capture the net impact on EU trade with non-EU regions, figure 2 and 3 show the changes in the value of EU25 exports to and imports from other regions for selected agricultural commodities. The changes in trade values are depicted for both the "auxiliary" Agenda 2000 enlargement

scenario and the "realistic" MTR enlargement scenario in order to illustrate whether the changes in the MTR-enlargement scenario are attributable to primarily to the Eastern Enlargement or the MTR-reform.

FIGURE 2: Change in value of EU25 exports for selected commodities, mill 1997-US$

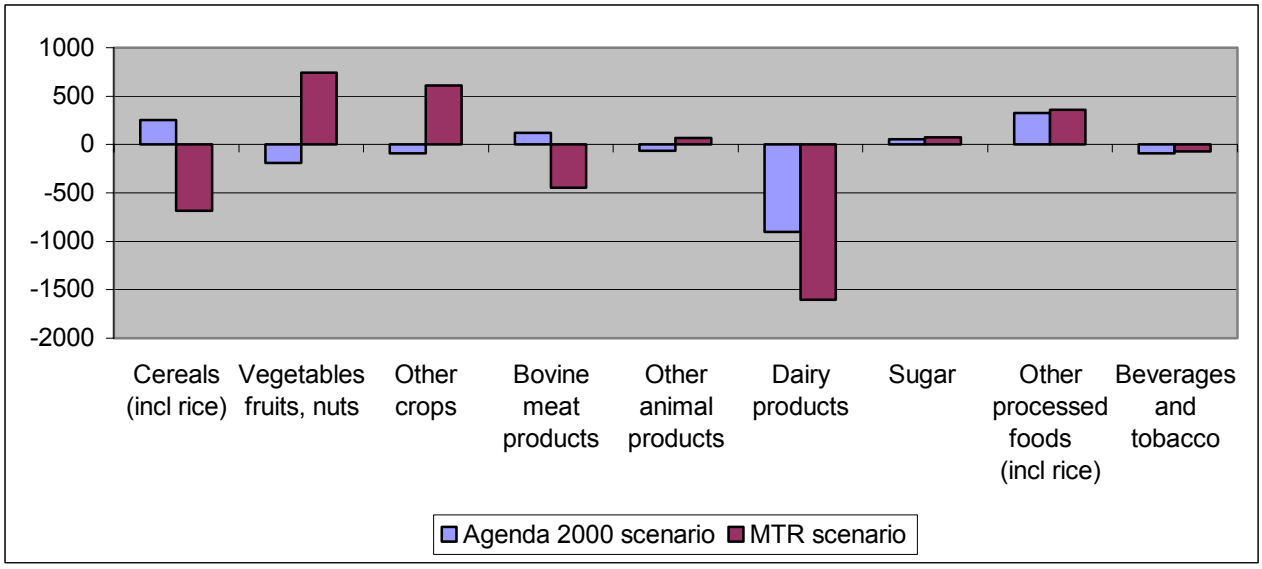
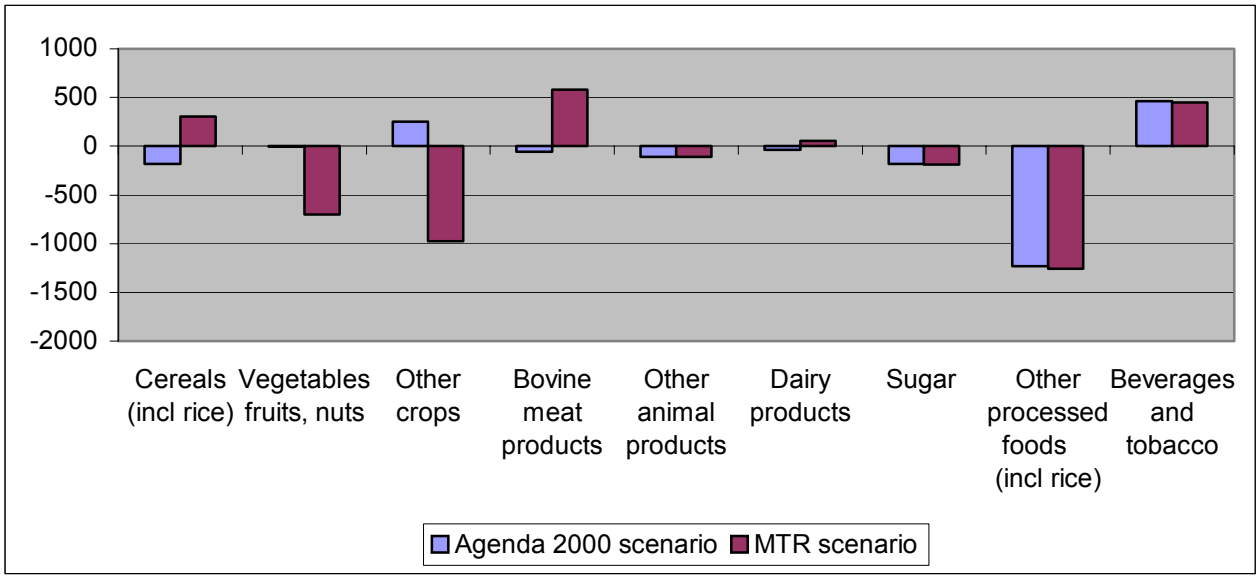


FIGURE 3: Change in value of EU25 imports for selected commodities, mill 1997-US$



Not surprisingly the overall picture conveyed by the figures clearly mirrors the effects on EU25 agricultural production laid out in table 2. Focusing first on the MTR-enlargement scenario, figure 2 shows a decline in the value of EU25 exports of cereals, bovine meat

products, and dairy products of respectively 687, 444, and 1601 million 1997-US$, and figure 3 shows an increase in the value of EU25 imports of cereals and bovine meat products of respectively 307 and 578 mill 1997-US$. Comparing these trade results for the MTR-enlargement scenario with the results for the Agenda 2000 enlargement scenario demonstrates that the decline in the value of net-exports of cereals and bovine meat products in the MTR-enlargement scenario is driven by the decoupling effect of the MTR-reform, as the net-export value of these commodities would have increased in the event of an Agenda 2000 enlargement. The drop in EU dairy exports, on the other hand, is driven both by the Eastern Enlargement and the MTR-reform, as should be expected given the results for EU25 production presented in the previous section.

The decline in EU25 production of cereals and bovine meat products induced by the decoupling of the direct payments was followed by an increase in the production of commodities, which had either not received coupled support or continued to do so, such as the categories vegetables, fruits, and nuts and other crops. These production effects are also mirrored in the MTR-enlargement scenario trade results, as the value of EU25 exports of e.g. vegetables, fruits, and nuts and other crops increase by respectively 742 and 611 million 1997-US$, while the value of EU25 imports of these commodities drop by 701 and 976 million 1997-US$.

For most commodities there is a pronounced difference between the trade results for the Agenda enlargement scenario and those for the MTR-enlargement scenario, but for some commodity categories such as beverages and tobacco and other processed foods this is not the case. The changes in value of EU25 imports and exports of these commodities are thus driven primarily by the Eastern Enlargement effect. In the case of beverages and tobacco, the increase in value of EU25 imports of these commodities is explained in part by the fact that these commodities have been subject to substantially higher import tariffs equivalents in the accession countries than in the EU. Accession to the EU consequently implies a significant lowering of the import barriers for beverages and tobacco in the new EU member countries, and imports subsequently increase.

The total change in value of EU agricultural exports and imports[10] following the Eastern Enlargement and the MTR-reform amounts to respectively –919 and –1993 million 1997-US$. The joint effect of the two reforms thus results in a net improvement in the EU's agricultural trade balance by approximately 1 billion 1997-US$. However, the overall impact on EU exports and imports is of course not equally distributed across the EU's trading partners. In order to ascertain the specific impacts on EU trade with different regions, figure 4 and 5 show the changes in value of EU agricultural exports and imports by region.

FIGURE 4: Change in value of EU agricultural exports by region, million 1997-US$.

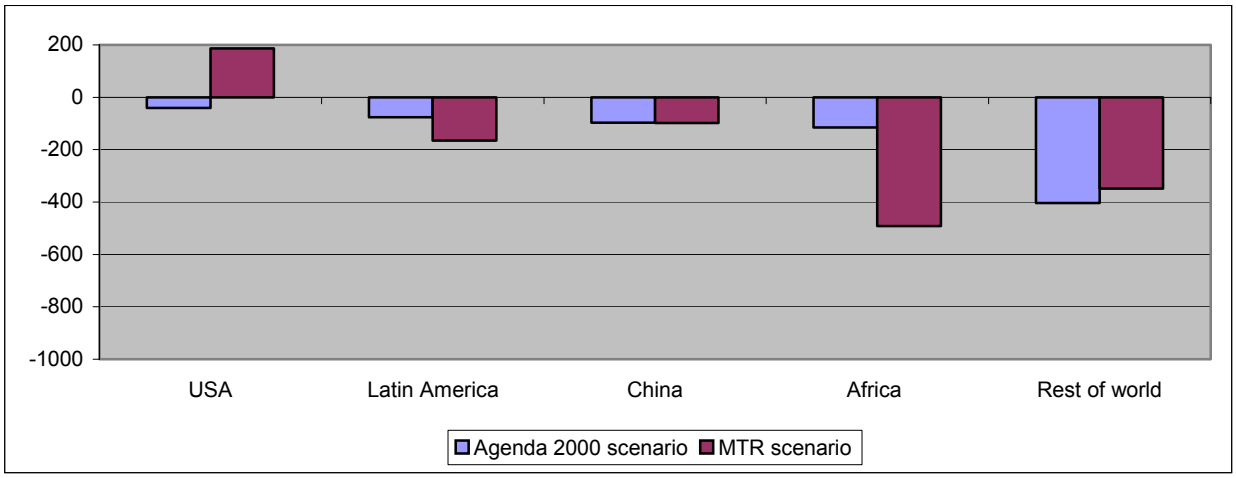
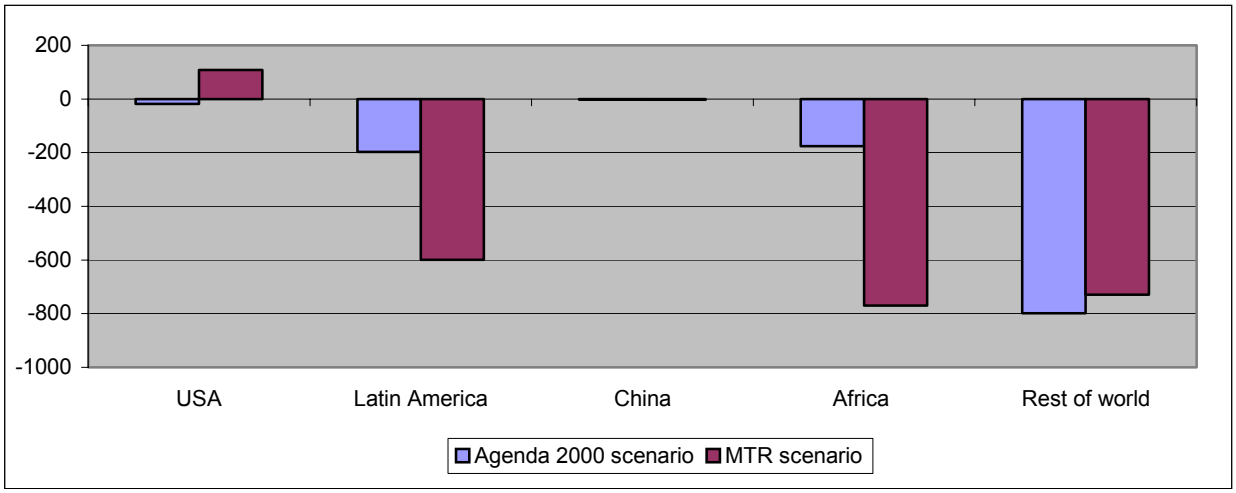


FIGURE 5: Change in value of EU agricultural imports by region, million 1997-US$



[10]Agricultural commodities have here been defined as including paddy rice, wheat, other grains, vegetables, fruits and nuts, oil seeds, sugar cane and beet, plant-based fibers, other crops, bovine animals, other animals, raw milk, wool, bovine meat products, other animal products, vegetable oils and fat, dairy products, processed rice, sugar, other food products, and beverages and tobacco.

The first feature, which stands out in figure 4 and 5, is that the Eastern Enlargement and the MTR-reform leads to a reduction in the value of both EU agricultural exports to and imports from the respective regions in all but two cases. The most notable of these exceptions is that of the USA. While an Eastern Enlargement under the Agenda 2000 CAP would result in minor decreases in the value of both EU agricultural exports and imports, the Eastern Enlargement under the MTR-reform actually increases the value of EU agricultural exports to and imports from the US by respectively 186 and 108 million 1997-US$. The net increase in the value of EU agricultural exports to the US is primarily attributable to the commodity groups other crops and vegetable, fruits, and, nuts, while the net increase in the value of EU agricultural imports from the US is attributable to increases in imports of cereals and bovine meat products, while the EU import of US vegetable, fruits, and nuts and other crops decline. However, it must be noted that these changes in the value of EU exports to and imports from the US only account for a minor fraction of EU-US trade. Hence the increase in the value of EU net agricultural exports to the US following the Eastern Enlargement and the MTR-reform only amounts to 2 per cent of the value of EU net agricultural exports to the US, while the corresponding number for EU net agricultural imports from the US is 1 per cent. The effects of the two reforms on EU-US agricultural trade are thus negligible.

The other exception to the general pattern of the Eastern Enlargement and the MTR-reform leading to a reduction in the value of both EU exports and imports is China. In the case of EU-China trade only EU net agricultural exports decline following the two reforms, while EU net agricultural imports from China are basically unchanged. The reason why EU agricultural imports from China are unaffected by the two reforms is that the EU25 basically does not import agricultural commodities from China. The EU does, on the other hand, export agricultural commodities to China, and figure 4 shows that the change in value of EU net agricultural exports is apparently not affected that much by the MTR-reform as the decline is of same magnitude in the two scenarios. However, closer inspection shows that the MTR-reform does actually affect the composition of EU agricultural exports to China, but these changes cancel out when calculating the net change in value of EU agricultural exports to this region.

For Latin America and Africa, the Eastern Enlargement effect leads to declining values of net agricultural imports from and exports to the EU25, and the MTR-reform further exacerbates the drop in these trade flow values. In the MTR-enlargement scenario, the net value of Latin

America's and Africa's agricultural exports to the EU25 decline by respectively 600 million and 770 million 1997-US$, in both cases corresponding to a 7 percent reduction in the net value of these regions' agricultural exports to the EU. In terms of the effects on agricultural imports from the EU, Africa is more affected than Latin America both in absolute and relative terms, as the net value of African agricultural imports from the EU decline by 492 million 1997-US$ in the MTR-enlargement scenario, corresponding to a 5 percent reduction in the value of this trade flow. This furthermore implies that Africa's agricultural trade balance vis-à-vis the EU25 deteriorates in the MTR-enlargement scenario. As the next sections will also show, the region, which is home to some of the poorest countries in the world, thus also appears to be the region most affected by the Eastern Enlargement and the MTR-reform. The reason why the value of Africa's trade with the EU25 is so affected by the MTR-reform is that the net value of the regions imports of cereals and bovine meat products from the EU decline following the MTR-reform, while the value of the regions net exports of other crops and vegetables, fruits, and nuts to the EU also decline. The region is also affected by the Eastern Enlargement effect, as this reform leads to a decline in the value of Africa's import of dairy products from the EU as well as a decline in the value of Africa's export of sugar to the EU among other things.

Summing up, figure 4 and 5 show that the Eastern Enlargement and the MTR-reform result in declines in the net value of EU agricultural exports to and imports from each of the five regions, except for the case of EU-US agricultural trade in the MTR-enlargement scenario. Furthermore, for all the regions except China, the Eastern Enlargement and the MTR-reform will produce a deterioration in these regions' agricultural trade balances vis-à-vis the EU, as either EU imports decline by more than EU exports (cf. Latin America, Africa, and Rest of World) or EU exports increase by more than EU imports (cf. USA). However, it should also be noted that these declines in the agricultural trade flow values only amount to small percentage shares of the regions' total agricultural trade with the EU (the maximum decline in the value of a region's agricultural exports to the EU being 7 percent, while the maximum decline in the value of a region's agricultural imports from the EU is 5 percent).

7. Production in non-EU regions.

While the *net* effects of the Eastern Enlargement and the MTR-reform on the value of agricultural trade flows between the EU and non-EU regions may not seem that substantial, it

should be remembered that the effects of the reforms are not uniform across the agricultural commodities (cf. table 2 and figure 2 and 3). The impact on trade in *certain* agricultural commodities may thus be substantial enough to also affect production patterns in non-EU regions.

TABLE 3: Change in volume of in non-EU regions, baseline 2013 = index 100

	USA	Latin America	China	Africa	Rest of World
Cereals (incl. rice)	100.7	100.4	100.1	100.2	100.2
Vegetables, fruit, and nuts	99.1	99.7	99.9	99.4	99.6
Oilseeds	99.8	100.1	100.0	100.4	100.1
Sugar cane and beet	99.9	99.9	100.0	98.7	100.0
Plant-based fibers	99.4	99.8	99.5	100.3	99.7
Other crops	98.7	98.2	99.4	98.7	98.9
Bovine animals	100.4	100.2	99.9	100.2	100.4
Other animals	99.8	100.0	100.0	100.0	100.1
Raw milk	100.6	100.3	100.6	100.5	100.9
Wool	99.0	99.9	99.5	99.2	99.3
Bovine meat products	100.5	100.3	100.2	102.1	101.0
Other meat products	99.7	100.1	100.3	100.3	99.8
Vegetables, oils, and fat	99.8	99.9	100.0	100.0	100.1
Dairy products	100.6	100.7	101.5	105.1	102.8
Sugar	99.9	99.8	99.9	98.9	99.9
Other processed foods (incl. rice)	99.9	99.9	100.0	99.7	99.8
Beverages and tobacco	100.2	100.0	100.0	100.1	100.1
Natural resources	100.0	100.0	100.0	100.0	100.0
Textiles/wearing apparel	99.7	99.8	99.4	99.0	98.7
Manufactures	99.9	100.0	100.1	100.2	99.9
Services	100.0	100.0	100.0	100.1	100.0

Table 3 shows the impact on production patterns in non-EU regions in the MTR-enlargement scenario, and while the Eastern Enlargement and the MTR-reform will not conjure major structural shifts in the agricultural production patterns in the non-EU regions, the reforms will have a noticeable impact on the production of e.g. dairy products and to a lesser extent other crops and bovine meat products.

Starting with dairy products, the table shows that production of these commodities will increase in the non-EU regions following the decline in EU25 production of dairy products induced by the Eastern Enlargement and the MTR-reform. The largest increase will take place in Africa, where the volume of dairy production will increase by 5.1 percent, but also the category Rest of World and China will experience notable increases in dairy production by respectively 2.8 and 1.5 percent.

The production of other crops in non-EU regions will also be affected by the European reforms. While EU25 production of other crops increases following the MTR-reform, the volume of production for these commodities decline in non-EU regions by up to 1.8 percent in Latin America and 1.3 percent in the US and Africa. Another set of commodities, which was also significantly affected by the MTR-reform, is bovine meat products. In this case, declining EU production leads to an increase in the production of bovine meat products of 2.1 percent in Africa and 1.0 percent in the Rest of World category.

Turning the focus to the regional dimension of the production changes, Africa in many ways appears to be the region, whose agricultural sector will be affected most by the European reforms. Apart from the above-mentioned impacts on the production of dairy products, other crops, and bovine meat products, African sugar production is also affected as both the production of sugar cane and beet and the production of processed sugar will decline by respectively 1.3 and 1.1 percent. This is perhaps not very surprising, as the previous section showed that Africa was also the region, whose agricultural trade with the EU was most affected by the reforms. The question that remains to be answered is how the Eastern Enlargement and the MTR-reform affects the welfare of Africa and the other non-EU regions.

8. Welfare effects

One way of measuring the welfare impact of the Eastern Enlargement and the MTR-reform is to consider these reforms' impact on the welfare measure known as equivalent variation (EV). Table 4 shows the absolute changes in EV in the MTR-enlargement scenario and the decomposition of these EV-changes as well as the relative (i.e. percentage) change in EV.

TABLE 4: Change in economic welfare in the MTR-enlargement scenario, million 1997-US$

			of which	
	Percentage change in EV	Total EV	Allocative efficiency	Terms of trade
EU25	0.14	13,099	11,476	1,793
USA	0.00	-308	-147	-84
Latin America	-0.02	-368	-177	-182
China	-0.02	-526	-282	-214
Africa	-0.06	-484	-139	-333
Rest of world	-0.02	-1,732	-897	-1,022
Total	0.03	9,681	9,835	-42

The table shows that the Eastern Enlargement and the MTR-reform will lead to an increase in total global welfare of almost 10 billion 1997-US$. However, this welfare gain is very unevenly distributed, as the EU25 stands to gain 13 billion US$, while every non-EU region will suffer a welfare loss ranging from circa 300 million in the US to 1.7 billion in the Rest of World category. Within the EU the welfare gain is also not evenly distributed, as the ten new EU members reap 12.7 billion (corresponding to a 3.34 percent increase in welfare in these countries), while the fifteen old EU members share a gain of merely 365 million. The reason for this is that while both the old and the new EU member countries obtain significant allocative efficiency gains following the reforms (6 and 5.5 billion US$ respectively), the old member countries also transfer 5 billion US$ to the new member countries in CAP payments. On top of this the new member countries also obtain a 2.2 billion welfare increase from improved terms of trade, while the old EU members suffer a terms of trade loss of around 430 million US$.

The non-EU regions all suffer minor welfare losses ranging from a non-noticeable decline in US welfare to a 0.06 percent decline in African welfare. Terms of trade losses make up between one-third and two-thirds of these welfare losses. For regions like Africa and Latin America terms of trade losses on agricultural commodities account for more than half of the regions' total terms of trade losses. For these two regions the agricultural terms of trade losses are especially associated with dairy products and other crops and in the case of Africa also with cereals. The allocative efficiency losses experienced by the non-EU regions typically arise from these regions own distortionary programs, as their production adjustments following the European reforms may e.g. push resources into subsidy-receiving sectors.

Overall the welfare analysis shows that from a national welfare point of view the effects of the Eastern Enlargement and the MTR-reform on non-EU regions are generally negligible, making these reforms primarily a European matter. The EU25, on the other hand, stand to realize significant gains in welfare primarily due to improvements in allocative efficiency following the two reforms. Finally, it should be noted that European welfare gains are more than large enough to potentially compensate the non-EU regions for their welfare losses, thus making the MTR enlargement scenario a potential win-win for all regions.

9. Qualifications.

As in all quantitative studies, the results naturally depend on the data and the assumptions applied in the model. When contemplating the implications of our simulation results, it is especially important to remember that the approach taken in the modeling of foreign trade is the Armington specification, which assumes incomplete substitutability between domestic and foreign commodities. This assumption is a key determinant of the size of the trade effects in the model. To the extent that certain primary agricultural commodities are closer to being perfect substitutes, the trade effects could be somewhat larger than estimated in this study. Meanwhile the level of commodity and regional aggregation used here could also hide potentially smaller or larger trade effects than those found in the study. These caveats should of course be kept in mind when drawing conclusions based on the estimated effects on trade, production, and welfare.

10. Conclusion

The question underlying this analysis has been how agricultural sectors in non-EU regions would be affected by the Eastern Enlargement and the MTR-reform, and whether these reforms would prove beneficial or detrimental to the non-EU regions. The analysis has shown that the Eastern Enlargement and the MTR-reform will have a significant impact on the agricultural production structure in the EU25, but the derived effects on agricultural production in non-EU regions are only minor. Given these supply responses it is hardly surprising that the overall welfare implications for the non-EU regions are negligible. The Eastern Enlargement and the MTR-reform thus appear to be primarily European matters.

As previously mentioned, the CAP has attracted substantial criticism from EU trading partners for its distortionary impact on agricultural trade. The MTR-reform addresses some of these distortionary features, in particular the issue of coupled domestic support payments. However, the reform does not address other important issues, such as market access and export subsidies. Although the EU has established the Everything But Arms initiative, which removes all EU restrictions on imports from least developed countries, other countries still face significant EU import barriers especially on processed agricultural commodities (cf. Jensen and Frandsen 2003a), and these import barriers may well prove more important to these non-EU regions than the domestic support payments. If the ongoing WTO negotiations

succeed in addressing these market access issues we may thus see more pronounced effects in non-EU regions than those produced by the Eastern Enlargement and the MTR-reform.

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