

Economic Impacts of the Enlargement of the European Union

Analysing the importance of direct payments

By

Søren E. Frandsen and Hans G. Jensen

Danish Institute of Agricultural and Fisheries Economics (SJFI)

E-mail: Soren@sjfi.dk and Hans@sjfi.dk

Abstract

The preparations for the enlargement of the European Union to include several of the Central and Eastern European Countries has led to a discussion of the future design of the Common Agricultural Policy. This paper addresses this issue from an economy-wide perspective focusing on the economic effects of the extent to which the direct payments are extended to the new member countries.

Specifically this working paper focuses on three enlargement scenarios ranging from a situation where no direct subsidies are given to the new member countries to a scenario where the farmers in the new member states are given the same level of direct payments as under the existing Common Agricultural Policy. A third scenario analyses the effects of reducing the direct payment to two thirds of the existing level of direct payments in all member countries (both in the new as well as in the old member countries).

The analyses illustrates that the Central and Eastern European Countries clearly have a solid potential for increasing their production of agricultural commodities and that the extent the direct payments are extended will affect the supply response in the CEEC's. It is shown that the major force behind the significant crop supply response is due to very large shifts in the use of agricultural land. It is important to stress that the crucial assumption behind this result is that there are no – in economic terms – effective restrictions on the allocation of land and that the incentives for overshooting the so-called base area with crops receiving the compensatory payments is very high given the existing value of hectare premiums.

The analysis also illustrates that enlarging the EU with the existing CAP is an expensive option in budgetary terms as the level of CAP related expenditures could increase by one third thereby exceeding the constraints laid down in the EU 'Financial Perspectives'. It should be noted, however, that the analysis also illustrates that enlarging the Union leads in all cases to only small overall economic welfare losses in 'old' member states in spite of relative large increases in 'old' member states net contributions.

Keywords: *CGE modelling, European Enlargement, Common Agricultural Policy, hectare and animal premiums, GTAP.*

JEL classification: *D58, F02, F15, Q17 and Q18*

1. Background

The preparations for the enlargement of the European Union (EU) to include several of the Central and Eastern European Countries (CEECs) has led to a discussion of the future design of the Common Agricultural Policy (CAP). First the debate has clearly shown that it is untenable in the longer term to have 'two separate agricultural policies' within the same Community. Second, it is evident that economic and budgetary implications of the impending enlargement depend not only on the level of border protection within the EU at the time of accession, but also on the extent to which the direct payments are extended to the new member countries.

The European Commission has recently clearly indicated that there is a need for discussing the future role of direct payments. First, the EU's 'financial perspectives' (i.e. the maximum funding available for EU activities) for the period 2000-06 were drawn up on the basis of the enlargement taking place without direct payments being made available to the new member states. Second, in acknowledgement of the expected budgetary strains the EU Commissioner for Agriculture Franz Fischler has suggested that direct payments be gradually phased in the new member states within the context of a transitional post-accession period. Furthermore, the Commissioner has suggested that the level of the direct payments be progressively reduced over a period of time in order to reduce the pressure on the EU budget, cf. Agra Europe (2000).

Against this political and budgetary backdrop one of the important questions being raised is therefore whether or not there is a need to radically change the existing financing system (who is going to pay for the enlargement?) or the agricultural direct payment system if such direct payments, as they exist today, are to be introduced in the Central and Eastern European Countries at the time of accession.

More specifically, the paper analyses the economic implications of extending the support and protective instruments of the current Common Agricultural Policy, including the direct payments, to the Central and Eastern Countries. The purpose of this paper is to address this issue from an economy-wide perspective and to illustrate how a specially tailored GTAP model and database can address such an important aspect of the economic implications of enlarging the European Union. Notwithstanding, it is important to stress that the present analysis in no way pretends to provide a complete analysis of all the important economic aspects related to the enlargement of the EU.

The paper starts with a brief overview of the important changes that have been made to the standard GTAP model and database followed by some important characteristics of the scenarios presented. The scenarios consist of two distinct parts. First, the construction of a baseline scenario for the period 1995 to 2010, and second, three enlargement scenarios under different assumptions with respect to how the Common Agricultural Policy is extended to the new member countries. The paper concludes by identifying the areas for further research and by providing some tentative conclusions.

2. Adjusting the standard model and database

Adjusting the standard model

The base GTAP model is a standard multi-regional, static computable general equilibrium (CGE) model. Regional production is 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)¹. The foreign trade structure is characterised by the Armington assumption implying imperfect substitutability between domestic and foreign goods, cf. Hertel (1998).

In order to analyse the impacts of extending the Common Agricultural Policy to the Central and Eastern European Countries it is important to capture the key institutional features of CAP (the instruments), including the reform achievements of the Uruguay Round and the more recent reform of the CAP (Agenda 2000). We have therefore explicitly modelled the following features of the CAP, cf. Bach, Frandsen and Jensen (2000):

- Import and export policies, including the import tariff reductions and value and quantity based restrictions on export subsidies
- Direct payments to arable land and livestock, together with set-aside requirements and base area restrictions
- Budgetary limits on the total amount allocated to land and livestock according to the institutional rules of the Common Agricultural Policy
- Milk and sugar quotas
- The European Union agricultural budget and the important effects of inter-regional transfers between member states.

Adjusting the data

The global database used for this analysis is version 4 of the GTAP database, cf. McDougall (1998). Hence this means that only 5 of the 15 members of the European Union are explicitly represented in the database (Denmark, Finland, Germany, Sweden United Kingdom and rest of EU) and seven of the Central and Eastern European Countries are aggregated into just one region in the database (Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia). Version 5 of the database, to be released early 2001, will separate out all 15-member countries as well as several of the CEEC's.

A number of minor adjustments have been made to the standard version 4 data base to allow a more precise representation of the CAP instruments. First, the CAP subsidies have been allocated to the individual factors of production according to whether the subsidies are based on output decisions, use of land or capital intensity. Second, the common agricultural budget has been explicitly represented in the database (the 1995/96 budget) at the member state level, including the contribution of the individual member states to the financing of the agricultural expenditures. Finally, a few of the behavioural parameters have been adjusted. This includes for example basing the own price elasticity for fish on recent econometric evidence as well as setting the Armington elasticities for livestock to zero. The latter has been done to avoid unrealistic increases in trade in these products.

¹ Hence, the present analysis abstracts from features such as imperfect competition and increasing return to scale, which may however be important in certain sectors.

3. Experimental design

Baseline scenario

Before analysing the enlargement of the EU, a baseline for the period 1995-2010 is constructed². The baseline provides a benchmark against which alternative scenarios can be compared. It features projections of the world economy, cf. Table 1 below, plus incorporation of policy changes, including a full implementation of the Uruguay Round Agreement in all countries and the effects of changes in the CAP as outlined in the Agenda 2000 reform, cf. Box 1.

TABLE 1. Exogenous assumptions, annual growth rates, 1995-2010

	GDP	Population	Labour Force			Total factor productivity			
			Total labour force	Unskilled	Skilled	Industry	Services, Resources	Primary agriculture	Capital*
AUS	2.7	1.0	1.0	-1.0	5.2	0.75	0.38	1.05	1.7
NZL	2.5	1.1	1.2	-0.8	5.2	0.75	0.38	1.05	1.2
JPN	1.9	0.1	0.0	-0.7	2.8	0.50	0.25	0.70	1.6
KOR	4.7	0.7	1.3	0.9	4.2	0.75	0.38	1.05	4.7
THA	3.6	0.7	0.9	0.7	4.6	0.75	0.38	1.05	2.7
CHN	7.8	0.7	0.8	0.6	3.4	1.75	0.88	2.45	6.7
TWN	5.6	0.7	0.8	0.6	4.2	1.50	0.75	2.10	4.5
ROA	4.7	1.6	2.2	2.0	4.5	1.00	0.50	1.40	4.0
CAN	2.8	0.8	0.8	-0.7	3.3	1.00	0.50	1.40	2.6
USA	2.6	0.8	0.9	-0.5	3.3	1.00	0.50	1.40	1.7
RLA	4.2	1.4	2.1	1.8	4.1	1.00	0.50	1.40	2.9
GBR	2.2	0.1	0.1	-1.2	2.6	1.00	0.50	1.40	2.0
DEU	2.3	0.1	0.1	-0.8	2.6	1.00	0.50	1.40	1.7
DNK	2.4	0.1	-0.4	-1.9	2.6	1.00	0.50	1.40	3.0
SWE	2.4	0.2	0.0	-1.6	2.6	1.00	0.50	1.40	2.1
FIN	3.0	0.2	-0.4	-1.6	2.6	1.00	0.50	1.40	3.8
REU	2.6	0.1	0.1	-0.8	2.6	1.00	0.50	1.40	1.6
EFT	2.4	0.4	0.4	-1.9	5.2	0.75	0.38	1.05	1.2
CEEC	4.5	-0.1	0.1	-2.1	5.4	1.25	0.63	1.75	6.3
FSU	0.9	0.1	0.5	-1.4	5.4	0.25	0.13	0.35	0.0
MEA	4.0	2.2	3.1	2.9	5.4	0.50	0.25	0.70	3.8
SSA	3.1	2.7	2.9	2.8	4.9	0.50	0.25	0.70	1.2
ROW	2.9	2.1	2.3	2.2	2.8	0.50	0.25	0.70	2.5

Source: OECD Economic Outlook, World Bank forecast, USDA's long term projections and own estimates.

* The endowment of capital is determined endogenously – determined by the exogenous variables shown and by the model and associated data.

The baseline is shaped by relatively high rates of income growth in the Asian economies - particularly in China and a number of other developing countries (catching-up) – growth rates around 4-6 per cent per year. For a number of developed countries, including the current EU member states, we assume growth rates of approximately 2-2½ per cent per year. The global weighted average annual growth rate is 3 per cent.

For the Central and Eastern European Countries several important characteristics have been included in the baseline. First, the CEEC are assumed to partially catch up to the existing level of income in member states of the European Union as the annual GDP growth rate for this region is assumed to be 4.5 per cent compared to around 2.5 per cent for the European Union. Second, the

² The model is solved using GEMPACK (Harrison and Pearson, 1996).

baseline is shaped by higher rates of annual productivity growth in these reforming economies, e.g. it is assumed that total factor productivity in CEECs agriculture increases by 1.75 per cent per year compared to 1.4 per cent in the industrialised countries.

BOX 1 Assumptions shaping the baseline 1995-2010

Projections

Shocks to GDP, factor endowments and population
Sector specific shocks to total factor productivity
Capital stocks endogenously determined

Uruguay Round Agreement

Tariff reductions according to Agreement
Export subsidy rates are adjusted in line with changes in tariff rates
If export subsidy commitment (either in value or quantity) is binding, the export subsidy rate is further reduced

Agenda 2000 Reform

Intervention prices reduced (export subsidy reductions)
Hectare and livestock premiums and milk quota adjusted according to reform
National Envelopes and new premiums introduced
All direct payments are deflated by 2 per cent per year (the (maximum) budgetary outlays are fixed in nominal terms)
Set aside reflects the 10 per cent requirement
Sugar quota unchanged
Blair House Agreement concerning oilseeds abolished

Central and Eastern European Countries

Protection levels adjusted according to the recent PSE indicators (protection is raised from its 1995 to 1998 levels).

Third, the recent changes in the agricultural policies of the CEECs have been incorporated in the baseline reflecting steps in the direction of significant increases in protection for a number of agricultural products.

Given these exogenous assumptions, the data and the assumed behavioural parameters in the GTAP database, the model endogenously determines the implied annual growth rate in the stock of capital (the last column in the table). For the CEEC the implied annual growth rate of the capital stock is 6.3 per cent whereas the corresponding growth rates in the EU member countries are between 2 and 4 per cent. This growth rate implies that the capital-output ratio in the CEECs rises.

The border protection and domestic support levels in the CEEC are shown in Table 2 for the beginning (1995) and the end of the baseline period (2010). Import protection for wheat, other grains, oilseeds, and sugar and dairy products is assumed, as reported by the OECD (2000), to increase significantly in the CEEC during the period considered whereas the protection of other meat products (mainly pork and poultry meat) is assumed to decrease somewhat. In 2010 only sugar, other meat products and dairy products receive noteworthy export subsidies.

The table also reflects the assumption that the observed increases in protection in the Central and Eastern European Countries are incorporated mainly in the form of increased import protection. In

TABLE 2. Protection and output subsidies, CEEC, per cent (levels) and per cent points (change)

	Import tariff equivalent			Export subsidies			Output subsidies		
	1995 (levels)	2010 (levels)	Enlarg. (change)	1995 (levels)	2010 (levels)	Enlarg. (change)	1995 (levels)	2010 (levels)	Enlarg. (change)
Wheat	-17.9	12.3	0.0	-17.9	0.0	0.0	5.1	6.0	0.3
Other grains	-15.3	-0.6	45.1	-15.3	-0.6	23.2	4.9	5.8	-0.7
Vegetables, fruit, nuts	11.1	11.0	-5.8	0.0	0.0	-0.9	0.4	0.4	0.5
Oilseeds	3.8	7.0	-7.0	3.8	3.8	-3.8	6.0	6.6	2.3
Sugar cane and beet	29.1	61.0	15.5	29.1	29.1	47.7	4.0	4.6	-7.2
Other crops	8.9	9.9	-3.4	0.0	0.0	-0.4	0.4	0.4	-0.1
Bovine animals	2.3	-4.0	79.7	2.3	-4.0	72.8	6.1	7.0	-0.7
Other animal products	8.8	9.1	-8.6	33.8	9.1	9.5	5.2	6.0	3.0
Raw milk	-	-	-	-	-	-	5.9	5.9	3.0
Wool	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.9	25.1
Fish	7.3	4.6	1.2	0.0	0.0	-0.8	0.0	0.0	-0.6
Resource extraction	1.3	1.2	-1.2	0.0	0.0	-0.5	-2.6	-2.6	3.1
Bovine meat products	2.3	-4.0	79.5	2.3	-4.0	72.9	7.6	8.5	-7.9
Other meat products	33.8	9.1	9.5	33.8	9.1	9.6	7.5	8.4	-7.8
Vegetable oils and fats	3.8	3.8	-3.8	3.8	3.8	-3.8	1.9	1.9	-1.5
Dairy products	20.5	50.3	65.6	20.5	20.5	63.3	0.2	1.8	-0.8
Sugar	29.1	61.0	15.5	29.1	29.1	47.6	1.9	2.5	-1.7
Other processed foods	14.2	14.5	-4.9	0.0	0.0	0.2	1.5	1.5	-0.6
Beverages and tobacco	36.6	35.0	-11.7	0.0	0.0	-0.6	0.7	0.7	-24.7
Manufactures	8.0	7.0	-3.4	0.0	0.0	-0.5	-0.2	-0.2	-1.9
Services	0.0	0.0	0.0	0.0	0.0	-0.7	-0.3	-0.3	-2.1

Source: GTAP version 4 database, OECD PSE tables and own calculations.

Note: Columns (levels) indicate the level of the tax or subsidy in CEEC before accession and columns (change) are the change in taxes or subsidies in per cent points associated with an enlargement.

the case of export subsidies we have abolished the taxation of exports in a few cases, and the use of export subsidies is not increased in the baseline considering the CEEC Uruguay Round Commitments and the budgetary limitations facing a number of these countries.

Enlargement scenarios

The enlargement scenario considered in this paper entails the integration of the Central and Eastern European Countries into the European Union's Common Agricultural Policy in the year 2010 in a world shaped by the baseline scenario³.

³ The macroeconomic closure used is a neo-classical closure where investments are endogenous and adjust to accommodate any changes in savings. This approach is adopted at the global level and investments are then allocated across regions to equalise the marginal rate of return in all regions. Although global investments and savings must be equal, this does not apply at the regional level, where the trade balance is endogenously determined as the difference between regional savings and regional investments. This is valid as regional savings enter the regional utility function. The numéraire used in the model is a price index as suggested by de Melo and Robinson (1989) and de Melo and Tarr (1992), namely the global primary factor price index.

Enlargement of the European Union implies in principle that all tariffs and export subsidies as well as non-tariff barriers between the EU and the CEECs are abolished. At the same time all sectors in the CEEC are given the same level of protection against third countries as found in the EU at the time of accession. This leads to substantial increases in the CEECs agricultural protection rates against third country suppliers of cereals, sugar, bovine meat and dairy products. In the case of vegetables, fruit and nuts, oilseeds, other crops, beverage and tobacco and other processed food products, the pre-enlargement border protection rates in the CEECs are above the EU-15 levels. Therefore, integrating the CEECs into the CAP leads to reductions in border protection rates for these commodities, cf. Table 2.

The enlargement scenario also extends the reformed (Agenda 2000) CAP to the new member countries including the common financing of the agricultural policy (import tariffs and GDP contributions) and transfers from the EU-15 to pay for export subsidies, output subsidies and hectare and livestock premiums in the new member countries. The expansion of the CAP to the CEEC also implies that sugar and milk quotas are established on the basis of production levels in the CEEC prior to the enlargement in 2010 and that base area and animal premium rights are limited to historic production levels in 1994/95.

It is also important to stress, that the scenarios are based on the assumption – in line with the present rules under the Common Agricultural Policy – that the premium per hectare is reduced proportionally to the extent the total reform crop area exceeds the total defined base area. The total budgetary outlay is fixed (pre-defined as the EU per hectare premium multiplied by the defined base area eligible for the payments), however, the assumption used implies that there are no effective restrictions (in economic terms) at the individual farm level limiting the incentive to increase the reform crop area. This implies that there are no limitations restricting the reallocation of land in the enlargement scenarios analysed affecting in particular the estimated crops supply response in the new member countries (area reallocated from non-eligible crops to eligible crops).

Further, as indicated above, the extent to which farmers in the new member states will receive the same land and livestock premiums as the farmers in the ‘old’ member states is an unresolved issues. Hence, the precise conditions for the enlargement of the Union are yet unknown, and the three enlargement scenarios analysed here are therefore used to illustrate the impact of different possible levels of the direct payments to the new member states, cf. box 2. Figure 1 summarises the experimental design.

4. Results

Before examining the results of the enlargement scenarios it is useful to have an impression of the base line projection against which these experiments are performed.

Supply response

In the baseline both an expansionary and a substitution effect determine the changes in output. The expansionary effect represents the effects of growth in domestic and foreign demand shaped by income and population growth and the assumed income elasticities. The substitution effect reflects the changes in relative competitiveness shaped by changes in relative productivity, costs of produc-

BOX 2. The Design of the Enlargement Scenarios

Common for all three scenarios is that:

- The new member states are given the same level of border protection (import tariff and export subsidy rates) and output subsidy rates as in the EU at the time of accession (2010)
- Production of milk and sugar in the CEECs are limited by quotas – established on the basis of production levels prior to enlargement (2010)
- All member countries contribute to the common financing of the EU agricultural budget
- The common contribution rate across the member states is determined endogenously by the model given the estimated costs of the CAP (the rate balances the EU agricultural budget).

To illustrate the effects on the direct payments, three scenarios have been analysed. They all differ according to the extent to which direct payments are extended to the CEECs:

- **Scenario 1: No direct payments are given to the CEEC.**

It is assumed that the new member states will not receive the Agenda 2000 direct payments – while the farmers in the ‘old’ member countries continue to receive such payments. This scenario corresponds to the content of the ‘EU’s Financial perspectives’.

- **Scenario 2: Same level of existing direct payments**

It is assumed that farmers in ‘both regions’ will be treated equally - also in terms of eligibility for hectare and livestock premiums.

The maximum amount allocated to the new member states is determined as the EU per hectare or per head premiums and a defined base area or herd eligible for such payments in the CEECs. The base areas has been fixed to almost 27 million hectares assuming an average yield of 4.77 ton (EU average). The set-aside rate in the CEECs is equalised with the EU-15 rate. The following (maximum) number of premiums in the new member countries have been fixed to 1,205,900, 12,090,300 and 3,740,550 for suckler cows, mother ewes and male bovine animals, respectively.

If the area or number of animals exceed the total base area or maximum number of animals the direct payments are reduced proportionally in line with the overshoot of the total area or number of animals.

- **Scenario 3: 2/3 of the existing level of direct payment in all member states**

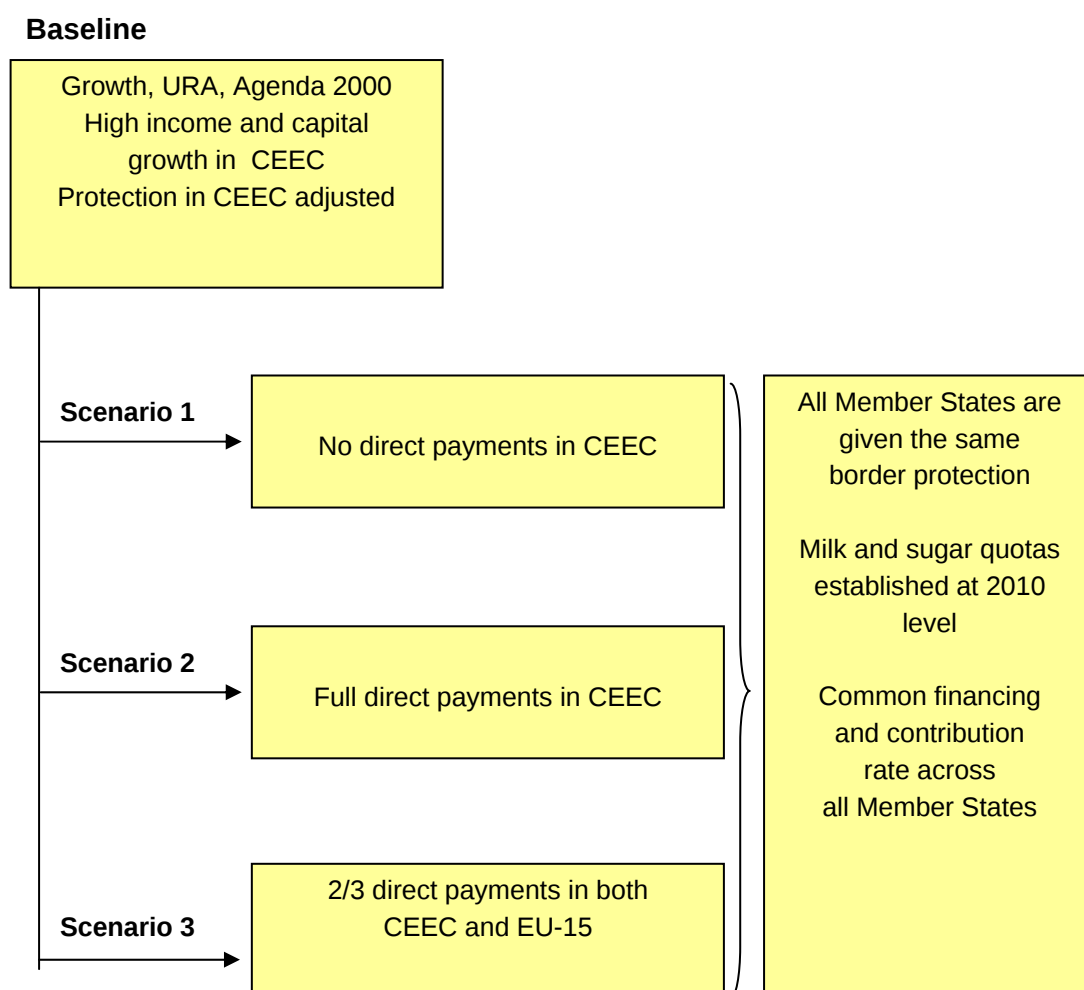
Scenario 3 is based on the same assumptions as scenario 2 except that the (per unit) level of direct payments in the old EU-15 member states is reduced by 33 per cent. The CEECs will receive a similar payment level (as in the old EU countries) when they are fully integrated in 2010. This scenario corresponds to the so-called principle of degressivity – i.e. that the direct payments in the old member countries would be progressively reduced over a period of time while the direct payments to the new member states would be progressively increased to the same level.

tion as well as the effects of any policy changes. The estimated annual changes in production in the EU and CEECs in the period 1995-2010 are shown in figure 2 for selected commodities⁴.

Agricultural production in the European Union increases only marginally in the period considered – typically less than 1 per cent per year. The production of wheat and other grains falls marginally

⁴ Given the applied macroeconomic assumptions the real exchange rate in the CEEC appreciates by 6.8 per cent in the baseline.

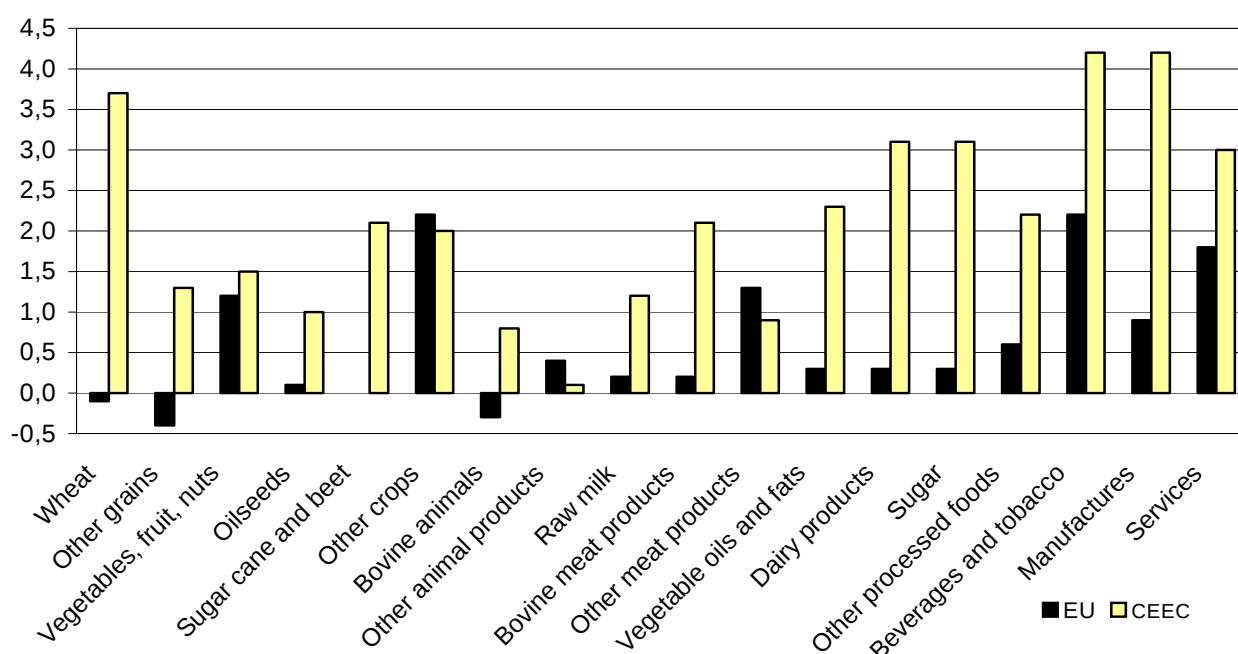
Figure 1. **Experimental design**



due to lower export subsidy rates (complying with the Agenda 2000 reform and the Uruguay Round Agreement). The production of ‘other meat products’ (pork and poultry meat) increases by 1.3 per cent per year - mainly a result of increased global food demand (in for example Asia and China) and increased competitiveness relative to the production of milk and bovine meat products.

The agricultural production in the CEECs increases somewhat more – typically 1 to 3 per cent per year. This reflects the tendency to increased agricultural protection for some of the commodities and the assumed high rates of agricultural productivity growth. For example, the production of dairy products and sugar increase by more than 3 per cent per year – a result of more than a doubling of the import tariff rates from 1995 to 1998 as reported by the OECD. The production of wheat and other grains is estimated to increase between 1.3 and 3.7 per cent per year – also a result of a tendency to higher agricultural protection. For the non-agricultural commodities the production results reflect the high overall growth assumptions applied to the reforming countries – the production of manufactured goods and services increase by 4.2 and 3.0 per cent per year, respectively.

FIGURE 2. Annual changes in production, selected commodities, per cent, 1995-2010



Extending the Common Agricultural Policy to the new member states is expected to affect the agricultural supply response significantly given the applied assumptions. As indicated above in box 2, the three enlargement scenarios differs with respect to the extent the direct payments are extended to the CEECs – while at the same time all three scenarios are characterised by the same and typically higher level of the border protection (being equalised with the EU level of protection).

In all three enlargement scenarios this implies that agricultural border protection increases significantly for a number of commodities, e.g. ‘other grains’, ‘sugar’, ‘bovine meat products’, and ‘dairy products’, cf. Table 2. The estimated impact on production levels in the EU and CEEC is shown in Table 3 for each of the three scenarios⁵. The results illustrate that the supply response in both the old and new member countries depend critically on the level of the direct payments given to the new member states.

In scenario 1, where no direct payments are provided to the farmers in the new member states, the production of wheat falls by almost 7 per cent in the CEECs while the production of ‘other grains’ increases by almost 30 per cent. This difference is due to the fact, that accession to the CAP will not change CEECs border protection for wheat whereas the CEECs import tariff rate for ‘other grains’ will increase significantly, i.e. by 45 percentage points. Of course, these results depend on the relative level of protection in the two regions prior to enlargement and thereby the assumed changes in protection in the period prior to enlargement (the baseline assumptions).

⁵ Note that the results shown from the baseline are yearly changes whereas the reported results in the enlargement scenarios are accumulated or total changes in the levels in 2010.

The production of bovine meat products in the CEEC more than doubles due to significantly higher protection rates for these products equivalent to an increase of 80-percentage points in the import tariff rate. The production of dairy products increases by a third in spite of the enforcement of milk quota at the farm level. This is explained by a significant shift in the consumption pattern in the CEEC – the on-farm consumption of milk is reduced significantly and the deliveries to dairies increase correspondingly.

TABLE 3. Enlargement: Change in production, selected commodities, per cent

	Scenario 1		Scenario 2		Scenario 3	
	EU15	CEEC	EU15	CEEC	EU15	CEEC
Wheat	-0.4	-6.6	-1.9	12.3	-2.2	7.0
Other grains	-3.7	28.9	-7.2	63.2	-7.6	55.3
Vegetables, fruit, nuts	0.9	-4.4	2.8	-13.9	3.6	-11.7
Oilseeds	0.4	-12.5	-0.3	-0.4	-1.6	-4.3
Sugar cane and beet	0.0	0.0	0.0	0.0	0.0	0.0
Other crops	1.0	-13.4	1.4	-30.9	3.6	-29.9
Bovine animals	-4.3	93.9	-3.9	85.1	-7.4	91.1
Other animal products	-0.4	-0.9	-0.1	-4.3	0.1	-3.4
Raw milk	0.0	0.0	0.0	0.0	0.0	0.0
Bovine meat products	-6.9	142.7	-6.3	129.2	-9.4	138.9
Other meat products	0.0	-0.6	0.4	-5.6	0.4	-4.3
Vegetable oils and fats	0.0	-7.9	0.0	-3.4	-0.1	-4.8
Dairy products	0.2	32.2	0.1	30.4	0.3	30.8
Sugar	-0.3	5.0	-0.3	4.8	-0.3	4.8
Other processed foods	0.1	0.1	0.2	-1.4	0.2	-1.0
Beverages and tobacco	5.0	-59.2	5.2	-60.3	5.2	-60.0
Manufactures	-0.1	3.8	0.0	2.2	0.0	2.7
Services	0.0	-1.8	-0.1	-0.9	0.0	-1.1

In scenario 2 where premiums are set at the Agenda 2000 level and extended to the farmers in the new member countries, production of both crops increases significantly due to the now much higher return to land. Production of wheat and other grains in the CEECs increases by 12 and 63 per cent, respectively. For the remaining commodities, the supply response corresponds approximately to the supply response in scenario 1 - except for 'vegetables, fruit and nuts' and 'other crops' as the relative competitiveness of these crops falls significantly - they do not qualify for direct payments or at least only very limited support.

In scenario 3 the structural shift in production in the CEEC is slightly more moderate due to the lower level of direct payments extended to the new member states. By comparing the three scenarios, it is evident that the other land using sectors (which do not receive CAP payments) are also affected by the extent to which the direct payments are extended to the new member regions. Furthermore, the enlargement only marginally affects agricultural production in the EU-15 region. There are a few exceptions. Production of 'other grains', 'bovine animals' and 'bovine meat products' fall by 4-9 per cent in the scenarios considered. The milk and sugar quotas in the EU-15 are binding in all scenarios and therefore the enlargement does not affect the production of these products, although the value of the quotas is marginally reduced due to slightly lower market prices in the EU.

Supply response in the individual EU-member countries

Enlarging the European Union affects the individual member countries differently depending on a number of factors such as the structure and level of production and trade. The importance to the individual economies of the estimated percentage changes is difficult to compare across the individual member countries. In Denmark, for example, the production of bovine meat products is relatively small - Denmark specialises in milk production as opposed to raising cattle for meat production. More importantly in this case is the estimated increase in the production of other meat products (1.5 and 3.5 per cent in scenario 2 and 3, respectively) given that Denmark is a relative large producer of pork.

The results (not shown) also indicate that the individual country shares of overall EU agricultural production (the intra-industry competitiveness) changes somewhat due to the enlargement and that these changes depend on the level of direct payments given to the new member countries. In the case of other meat products, for example, Danish pig producers typically gain market shares in most of the 'old' member states as well as in the new member countries under the applied assumptions.

Allocation of land and yields

The size of the direct payments will – as expected - significantly affect the use of the agricultural land in the new member countries, cf. Table 4. Between 1995 and 2010 the total area allocated to the reform crops is estimated to increase from 27 to 30 million hectares (according to the base line). In terms of structural change, land is being reallocated from 'vegetables, fruit and nuts' production and grassland and towards wheat production (production of wheat has increased significantly since 1995 (OECD, 2000)). Enlarging the Union intensifies this effect when direct payments are extended to the farmers in the CEEC. The total area used for production of these reform crops increases by more than a third in scenario 2 and 3, which corresponds to 14 and 11 million hectares of land, respectively⁶.

The lower part of Table 4 shows the endogenously determined yields per hectare in the CEECs. The yields are estimated to increase significantly in the baseline – narrowing the spread to the EU-15 average from around 40 per cent to around 20 per cent (convergence), cf. Table 4 and 5. Yields per hectare in the EU fall slightly in the baseline due to the Agenda 2000 reform and the implementation of the Uruguay Round Agreement, i.e. lower border protection and output prices but higher direct payments. The extent the direct payments are extended to the CEECs does only marginally affect the yields per hectare in the EU-15 region, cf. table 5, due to changing market prices. It is also evident from Table 4 that the supply response for grains in the CEEC reported earlier is - as expected – mainly a result of changes in the structural reallocation of land, as yield per hectare remain almost constant across the three scenarios.

⁶ Note that the total budget for hectare premiums in the new member countries is fixed. This implies that an increase in the area beyond the defined base area leads to a proportionate reduction in the premium per hectare. As mentioned above the scenarios are based on the assumption that there are no – in economic terms – effective restrictions on the reallocation of land at the individual farm level and thereby at the national level.

TABLE 4. Grown area and average yield per hectare in the CEEC region

	1995	2010	Scenario 1	Scenario 2	Scenario 3
<i>Millions of hectares</i>					
Wheat	8.53	11.47	10.33	12.86	12.14
Other grains	15.40	15.24	18.09	24.55	22.92
Oilseeds	2.34	2.22	1.88	2.23	2.12
Other crops	0.67	0.72	0.60	0.47	0.48
Set-aside	0.00	0.00	0.00	4.46	4.18
Total	26.93	29.65	30.90	44.56	41.83
<i>Tons per hectare</i>					
Wheat	3.36	4.34	4.50	4.34	4.38
Other grains	2.91	3.58	3.88	3.62	3.69
Oilseeds	1.65	2.02	2.08	2.00	2.03

Note: In 1998 the arable land in the CEEC was 52.2 million hectares.

Source: Agricultural Situation and Prospects in the Central and Eastern European Countries and own calculations

TABLE 5. Grown area and average yield per hectare in the EU-15 region

	1995	2010	Scenario 1	Scenario 2	Scenario 3
<i>Millions of hectares</i>					
Wheat	16.45	17.25	17.26	17.20	16.74
Other grains	20.67	21.99	21.90	21.77	20.02
Oilseeds	4.70	3.76	3.77	3.75	3.67
Other crops	1.29	1.58	1.59	1.60	1.69
Set-aside	7.26	5.85	5.85	5.82	5.53
Total	50.37	50.42	50.38	50.13	47.66
<i>Tons per hectare</i>					
Wheat	5.30	4.97	4.95	4.90	5.01
Other grains	4.73	4.20	4.06	3.94	4.26
Oilseeds	2.18	2.78	2.78	2.77	2.80

Source: The Agricultural situation in The European Union, 1998 Report and own calculations

Land prices

The impact on the price of agricultural land in the three enlargement scenarios is shown in Table 6. As expected, land prices increase tremendously in the new member countries given the significantly higher level of border protection for many products and the introduction of direct payments. In scenario 1 land prices increases by almost 40 per cent in the CEEC and implementing this increased border protection by the introduction of hectare and livestock premiums leads to increases of 170 and 130 per cent in scenario 2 and 3, respectively.

For the 'old' member countries, the enlargement even without extending the direct payments schemes to the CEEC region will affect the land prices negatively, although only marginally, cf. table 6. It is, however, evident that lowering the direct payments by a third will reduce land prices significantly in the EU-15 region. The simulations indicate that given such a scenario, land prices would fall by 20-30 per cent in the EU member countries. The degree to which land prices are affected in the individual member countries reflects differences in the structure of production and hence the extent to which the individual agricultural markets are affected by the enlargement.

TABLE 6 Changes in land prices, per cent

	Denmark	Finland	Germany	Sweden	United Kingdom	Rest of EU	CEEC
Scenario 1	-1.5	0.0	-0.2	-0.6	-0.1	-0.1	38.7
Scenario 2	-1.9	-0.2	-0.3	-0.6	-0.5	0.2	170.4
Scenario 3	-22.8	-23.0	-24.7	-29.1	-22.5	-22.3	129.8

International trade

Enlarging the European Union and extending the Common Agricultural Policy to the new member countries will increase competition in the European agricultural markets and thereby affect the trade between the EU-15 and the CEECs. The expected implications for trade between the two regions are illustrated in Table 7 and 8. To illustrate the importance of the increased trade between the two regions, the results are presented in terms of shares of domestic consumption in the EU and the CEECs satisfied by CEEC and EU imports, respectively.

The two first columns of Table 7 illustrate the pre-enlargement EU imports from the CEECs - measured as a share of total EU usage (for intermediate inputs and final consumption) of the individual commodities. For all the commodities shown, EU imports of good and services from the CEECs region in both years shown satisfies only a minor share of overall EU consumption. In the case of oilseeds CEECs – having the largest share of EU domestic consumption – import from that region only amount to slightly more than 2 per cent of total EU consumption in both years. Nevertheless, the CEECs share of grains and manufactured goods are estimated to double from 1995 to 2010. This is due to significantly higher protection rates in the CEEC region in the case of grains and relatively high rates of production growth in the case of the labour intensive manufactured goods in the Central and Eastern European Countries.

The last three columns in Table 7 report how these 2010 import shares are affected by each of the three enlargement scenarios. In all three scenarios the CEECs increase their share of total EU consumption of especially grains, bovine meat products, dairy products and sugar. Relative to the pre-enlargement situation, the CEECs share of total EU consumption for these commodities increases significantly – an estimated increase of 5 to 15 times the estimated shares in 2010. In the case of other grains the CEECs share of total EU use increases from less than 1 per cent of total use prior to the enlargement to 5 and almost 9 percent in scenario 1 and 2, respectively.

In conclusion, extending the direct payment as well as the level of such payments provided to the farmers in the new member states is estimated to affect the EU-CEEC trade significantly. It is, however, also noteworthy that extending the EU border protection alone (scenario 1) to the new member countries also accounts for a relatively large share of the increased CEECs share of total EU consumption.

Analysing the opposite trade flow – exports from the EU-15 to the CEECs – also illustrate that enlarging the European Union and extending the instruments of the Common Agricultural Policy to the new member countries will lead to increased trade between the two regions. In some cases the enlargement leads to significantly larger trade shares between the two regions. The EU-15 shares of total CEEC use are estimated to increase for a number of commodities, especially for manufactured goods, beverages and tobacco, ‘other crops’ and ‘vegetables, fruit and nuts’, cf. Table 8.

TABLE 7 CEECs share of total EU-15 consumption, per cent

	1995	2010	Scenario 1	Scenario 2	Scenario 3
Wheat	0.7	1.4	2.4	3.4	3.1
Other grains	0.4	0.8	5.0	8.7	8.0
Vegetables, fruit, nuts	0.6	0.5	0.6	0.2	0.3
Oilseeds	2.4	2.2	1.7	2.4	2.1
Sugar cane and beet	0.0	0.0	0.0	0.0	0.0
Other crops	0.3	0.3	0.3	0.2	0.2
Bovine animals	2.0	2.1	1.4	1.4	1.3
Other animal products	0.2	0.3	0.3	0.3	0.3
Raw milk	0.0	0.0	0.0	0.0	0.0
Bovine meat products	0.3	0.5	8.7	8.0	8.7
Other meat products	0.7	0.2	0.3	0.1	0.2
Vegetable oils and fats	0.1	0.1	0.1	0.1	0.1
Dairy products	0.2	0.3	2.0	1.9	1.9
Sugar	0.4	0.6	1.7	1.7	1.7
Other processed foods	0.3	0.6	1.0	0.9	0.9
Beverages and tobacco	0.2	0.3	0.5	0.4	0.4
Manufactures	1.1	1.9	2.7	2.6	2.6
Services	0.1	0.1	0.1	0.1	0.1

TABLE 8. EU-15 share of total consumption in the CEEC, per cent

	1995	2010	Scenario 1	Scenario 2	Scenario 3
Wheat	0.4	0.1	0.1	0.1	0.1
Other grains	0.6	0.1	0.1	0.0	0.0
Vegetables, fruit, nuts	3.8	4.4	7.1	11.3	10.4
Oilseeds	4.4	4.5	5.7	4.7	4.9
Sugar cane and beet	0.7	0.1	0.2	0.2	0.2
Other crops	15.0	23.4	38.2	41.4	42.1
Bovine animals	1.2	1.1	1.2	1.2	1.3
Other animal products	2.8	3.0	3.2	2.9	2.9
Raw milk	0.0	0.0	0.0	0.0	0.0
Bovine meat products	2.0	1.0	0.2	0.2	0.2
Other meat products	4.2	7.5	7.7	9.5	9.0
Vegetable oils and fats	10.8	7.9	9.5	8.6	8.9
Dairy products	4.1	0.7	1.2	1.2	1.2
Sugar	11.7	3.8	6.1	6.0	6.0
Other processed foods	7.5	4.6	7.2	7.6	7.5
Beverages and tobacco	4.7	3.2	51.8	53.3	52.8
Manufactures	24.0	15.9	22.1	22.4	22.3
Services	3.2	2.4	2.5	2.6	2.6

The EU budget and inter-regional transfers

As indicated in the introduction one of the important questions being raised is whether or not there is a need to radically change the existing financing system (who is going to pay for the enlargement?) or the agricultural direct payment system if such direct payments are to be introduced in the Central and Eastern European Countries.

Table 9 illustrates the budgetary effects in the baseline and in the three enlargement scenarios analysed. The budget for 1995 is for the EAGGF financial year 1995/1996 and shows that the net cost of the CAP in that year was EURO 42 billion. Given the assumptions applied in the model analysis

this net cost increases to EURO 48 billion in 2010 (current prices) – a nominal increase of 14 per cent in total. This increase falls within the guidelines provided in the EU ‘Financial perspectives’ for the period 2000-2006⁷.

TABLE 9. Financial impact of extending the CAP to the CEEC (million of EURO at current prices)

	1995	2010	Scenario 1	Scenario 2	Scenario 3
Total agricultural expenditure	43152	49372	54726	65505	53166
of which					
Hectare premiums	15992	15994	15983	24448	16299
Livestock premiums	4150	10266	10266	12487	8324
Output subsidies	17306	18503	22317	22425	22400
Export refunds	5705	4610	6160	6145	6143
Levies	-940	-1125	-1032	-1039	-1058
Net cost of CAP:	42213	48248	53694	64466	52108
- as % of GDP	0.67	0.47	0.50	0.61	0.49

Note: The 1995 figures are taken from the EAGGF financial year 1995/1996 and figures for 2010 are all deflated by an inflation rate of 2 per cent per year as the (maximum) budgetary outlays are fixed in nominal terms.

To balance the EU agricultural budget the common rate of member state GDP contributions is reduced from 0.67 per cent of GDP in 1995 to 0.47 per cent in 2010. Note that this contribution rate is determined endogenously by the model given the estimated costs of the CAP. The reported fall in the contribution rate by definition reflects the 14 per cent increase in net costs and an approximately 44 per cent increase in the real GDP in the EU in the period considered.

The net cost of the extending the CAP to the new members is by definition highly dependent on the extent to which the direct payments are included in the agreement. Without extending these payments, the net cost increases by EURO 5.5 billion or by 11 per cent (scenario 1). This increase is explained entirely by increased output subsidies and export refunds. In scenario 2, the net cost increases by more than EURO 16 billion - a result directly related to the hectare and livestock premiums of a similar order of magnitude. The increase corresponds to a 34 per cent increase in the net costs of the Common Agricultural Policy.

In scenario 3, in which the direct payments in the ‘old’ member countries are reduced by a third and the new member countries receive similar direct payments, the net cost of the CAP is estimated to add up to approximately EURO 52 billion. This corresponds to an increase of 8 per cent relative to the estimated 2010 budgetary costs of EURO 48 billion. The significantly lower cost relative to scenario 2 is of course the assumed lower direct payment to the farmers in both the old and new member countries. The design of the scenarios seem to support the view that by reducing the Agenda 2000 premiums by a third the enlargement (with ‘one common’ agricultural policy) can be kept within the existing budgetary costs of the Common Agricultural Policy. That is, the common contribution rate is estimated to 0.49 per cent of GDP (approximately similar to the estimated rate in 2010) or a total cost below the extrapolated costs of the future CAP of EURO 56 billion using a deflator of 2 per cent per year.

⁷ In the Agriculture Newsletter of the European Commission, March 1999, the total expenditure of the future CAP in 2006 is reported to be EURO 41.7 billion (1999 prices). Using a deflator of 2 per cent per year this corresponds to approximately 48 billion in that year. Extending the period using the similar assumptions, the total expenditure of the future CAP amounts to EURO 56 billion in the year 2010 (current prices).

Leaving the aggregate EU budget, Table 10 illustrates the impact on net contributions of the individual member countries to the Common Agricultural Budget in the three scenarios. Net contributions are defined as the contribution (a per cent of their GDP) less support received (output subsidies, hectare and livestock premiums) and import tariff revenue collected. In 1995 and 2010 Germany, United Kingdom and Sweden were net contributors to the CAP budget whereas the 'Rest of EU', Denmark and Finland were net receivers of financial support from the CAP budget⁸.

TABLE 10. Net contributions to the CAP budget (million of EURO at current prices)

	1995	2010	Change in net payments 2010		
			Scenario 1	Scenario 2	Scenario 3
Denmark	-446	-564	68	293	347
Finland	-101	-210	50	208	164
Germany	5530	6991	918	4006	2103
Sweden	516	425	94	372	263
United Kingdom	2224	1963	427	1743	1360
Rest of EU	-7722	-8605	1944	7251	6572
CEEC	0	0	-3500	-13873	-10808
Total	0	0	0	0	0

Enlarging the European Union leads to higher net contributions for all the old member states whereas the new member countries – not surprisingly are net receivers of transfers from the CAP budget. Germany, for example, is in scenario 3 required to transfer additional EURO 2.1 billion to the Common Agricultural Budget compared with a no-enlargement situation, corresponding to a total net transfer of EURO 9.1 billion in 2010. In the case of Denmark - being a net receiver of EU transfers – the net transfer will be reduced by 50 and 60 per cent if the enlargement takes place as assumed in scenario 2 and 3, respectively.

Welfare implications

More important than such budgetary implications are the overall welfare implications – although the political debate very often focuses exclusively on the effects on the 'visible budget'. The welfare effects include changes in allocative efficiency, terms of trade, inter-regional transfers and contributions from other factors (changes in endowments, technical change and the effect of non-homothetic preferences). The welfare effects quantified by using the money metric value of the Equivalent Variation are shown in Table 11.

In total, the CEEC are estimated to gain a welfare improvement of approximately EURO 3, 10 and 8 billion in each of the three scenarios. These increases correspond to a welfare gain of 1.2, 3.4 and 2.8 per cent, respectively.

Note, however, that the (relatively small) welfare effects reported in this paper is explained entirely by the impacts of extending the Common Agricultural Policy to the Central and Eastern European Countries as the objective of this study has been to study these aspects. Therefore, the welfare effects reported do not include the effects of an extension of the structural funds support or the possible important effects of dynamic efficiency gains from trade liberalisation's or the potential role

⁸Note that the 'Rest of EU' hides significant differences across the countries included in this aggregate.

foreign direct investments might have (i.e. enhanced capital accumulation and higher productivity growth).

The overall welfare loss for the EU-15 is estimated to be very small. The loss corresponds to approximately 0.03, 0.15 and 0.10 per cent of total welfare in the three scenarios. This covers the economic impacts of both trade creation and trade diversion effects as well as the costs associated with transfers of income from EU-15 citizen to CEECs farmers through the CAP budget scheme. Decomposing the welfare losses experienced in the EU and the welfare gains experienced in the CEECs reveals that the story to be told is primarily one of redistribution from Western European tax payers to Eastern European farmers.

TABLE 11. Change in economic welfare, 1995-million EURO

	Denmark	Finland	Germany	Sweden	United Kingdom	Rest of EU	EU15	CEEC
Scenario 1								
Total welfare change	-126	-34	-1034	-56	-57	-832	-2139	3331
-of which								
Efficiency	-17	8	460	50	80	1076	1657	-489
Terms of trade effects	-71	-6	-654	-47	164	-513	-1128	1434
Transfers	-50	-37	-683	-69	-317	-1444	-2601	2563
Other effects	12	2	-157	10	16	50	-68	-177
Scenario 2								
Total welfare change	-323	-159	-3590	-300	-1070	-4907	-10350	9499
-of which								
Efficiency	-49	0	484	19	80	1033	1567	-1531
Terms of trade effects	-85	-20	-793	-67	114	-714	-1564	1860
Transfers	-218	-155	-2979	-277	-1295	-5389	-10313	10078
Other effects	28	16	-303	24	31	163	-40	-907
Scenario 3								
Total welfare change	-361	-112	-1794	-181	-593	-3712	-6753	7782
-of which								
Efficiency	-31	15	627	50	244	1918	2823	-1127
Terms of trade effects	-92	-11	-745	-50	149	-888	-1637	1817
Transfers	-258	-122	-1563	-196	-1011	-4883	-8031	7867
Other effects	19	5	-114	15	25	141	92	-775

Note: Economic welfare is measured as the money metric value of the Equivalent Variation (1995-level). 'Other effects' include welfare changes due to changes in endowments, technical change, and effects of non-homothetic preferences.

The efficiency gains achieved in the EU countries are relatively large when the direct payments are reduced by a third (scenario 3) whereas the contribution to the welfare change from the transfers is relatively large when the full CAP is extended to the new member countries (scenario 2). As expected, the contribution of terms of trade changes on welfare is almost unaffected by the extent to which the direct payments are provided to the farmers in the new member countries.

We find a similar pattern of welfare decomposition at the individual country level, although there are a few interesting differences. Differences in supply responses and changes in exports and imports as well as differences in tax structures in general explain these variations. In scenario 3, for example, the Danish welfare loss – being the largest relative loss - corresponds to a loss of 0.25 per

cent of national income whereas the remaining countries lose approximately 0.1 per cent of their national income.

This somewhat higher loss of income is partly explained by an increase in the Danish export of dairy products to third countries. The larger export of dairy products from the CEEC region to the 'old' member countries does not (as seen for other agricultural commodities) lead to a lower level of production in the 'old' member countries (the quota value is clearly still positive). The increased surplus of dairy products is exported to third countries supported by export subsidies with a loss of efficiency as a consequence. This loss is relative large in the Danish case, Denmark being both a relative large producer of milk and a relative large net-exporter of these products.

5. Areas for future research

The results estimated in this analysis are no better than the data and parameters used and our efforts has identified areas that require further data work in the future. These include for example improvements of the base data to more adequately reflect actual allocation of land across the crops producing sectors in especially the Central and Eastern European Countries as well as improvements in the cost structures - especially the factor cost shares in the land using sectors. A few of the input-output tables also need to be adjusted with respect to the links between the primary agricultural sectors and the processing industries

Representing the CAP correctly also requires an adequately representation of the EU sugar regime, including the sugar levies and A, B and C sugar quotas (and rents) in the database and the model. Also, the estimates of the milk quota rents in each of the 15 EU member states need to be updated. Furthermore, an explicit representation of the tariff rate quotas (TRQ's) in the database and the model would clearly enhance the usefulness of the database and the model for future policy studies as well as there is a need for econometric studies focusing on the determination of important behavioural parameters.

6. Conclusions and the need for further efforts

The analysis in this paper is a modest attempt to demonstrate that the GTAP general framework can be adjusted to address important policy relevant questions such as the economic impacts of an EU enlargement in general and the importance of the direct payments in particular. Naturally, the results estimated are no better than the data and parameters used and our work has identified areas for future data and model extensions.

There is no doubt that the standard GTAP model and database – like any other standard model - has to be adjusted and changed to be able to address more detailed policy issues such as the one addressed in this paper. The methods used correspond to some of our earlier work; cf. Bach et al. (2000) and Frandsen et al. (2000) supplemented by more detailed modelling at the individual country level. Particular effort has been put into the modelling of the financial issues related to the EU budget and the impact on the net transfers between the current and future member countries.

The analysis demonstrates, that the CEEC have a solid potential for increasing their production of agricultural commodities but also of labour-intensive manufactured goods. If the CEECs are integrated into the present CAP of the EU (with the Agenda 2000 reform fully implemented) it will

significantly boost agricultural production in some sectors and lead to a reallocation of resources between the different crops.

The analysis shows that the level of direct payments will affect the supply response in the CEECs. It illustrates that the major force behind the significant supply response of some of the crops is due to very large shifts in the use of agricultural land whereas the yields are almost independent of the level of the direct payments extended to the new member states. Relatively high direct payments to selected crops (modelled as input subsidies to land) will distort the allocation of the production factors, including the use of land. Important for understanding this result is also the assumption that there are no – in economic terms – effective restrictions on the reallocation of land at the individual farm level.

Enlarging the EU to include the CEEC in the present CAP is an expensive option in budgetary terms. It is found that if direct payments are extended in their full amounts to the new members the level of CAP related expenditures could increase by one third. The analysis also shows that if direct payments are reduced by one-third prior to enlargement, the impact on the EU budget will approximately correspond to a situation in which the direct payments were not extended to the CEECs, but the 'old' EU members retain their access to the current payments (a two tier CAP). In other words, the CAP expenditure level could be held within the present maximum rate of funding for the EU's CAP activities, if reforms are in place prior to enlargement.

In spite of these relatively high budgetary costs the current EU countries are estimated to lose no more than approximately 0.1 per cent of their national income. Overall economic welfare improves significantly in the Central and Eastern European Countries following accession. The gains for these countries amount to an annual welfare increase of 1 to 3 per cent depending on the extent to which the direct payments are provided to the farmers in the new member states.

References

- Agra Europe (2000), April 20, 2000, 'Reform of direct aid scheme pre-accession'.
- Bach, C.F., S.E. Frandsen and H.G. Jensen (2000), Agricultural and Economy-Wide Effects of European Enlargement: Modelling the Common Agricultural Policy, *Journal of Agricultural Economics – Volume 51, Number 2 – May 2000*, p. 162-180.
- Frandsen, S.E., H.G. Jensen and D. Vanzetti (2000), Expanding 'Fortress Europe': Agricultural Trade and Welfare Implications of European Enlargement for Non-member Regions, *The World Economy*, Vol. 23, no. 3, March 2000, p. 309-329.
- Harrison, W. J. and K. R. Pearson, 1996, Computing Solutions for Large General Equilibrium Models Using GEMPACK, *Computational Economics*, 9, p. 83-127.
- Hertel, T. W. (ed.) (1998), *Global Trade Analysis, Modeling and Applications*, Cambridge University Press.
- McDougall (1998), *The GTAP Database, Version 4*, Purdue University, Indiana, USA.
- OECD (2000), Monitoring and Outlook, PSE tables.
- The European Commission (1995), The Agricultural Situation and prospects in the Central and Eastern European Countries.
- The European Commission (1999), *Agriculture Newsletter No. 10, March 1999*, Berlin European Council: Agenda 2000, conclusion of the Presidency.
- The European Commission (1999), *The Agricultural Situation in the European Union 1998*