

**The Welfare Effects of the Berlin CAP Agreement  
on Greek Agriculture\***

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**Abstract**

The progress achieved through the 1992 CAP reform was not sufficient to meet the challenges facing the EU in the light of the WTO negotiations on the one hand and the EU's enlargement on the other hand. The Commission, having reviewed these prospects and the expected positive world market developments, concluded that the best option was to continue the 1992 approach through further shifts from price support to direct payments and the development of a more integrated rural policy to accompany this process. However, the agreement reached at the recent Berlin Summit is less ambitious than the Commission's proposals included in Agenda 2000.

The aim of this paper is to estimate the welfare effects on the producers, consumers and the budgetary, imports and exports flows caused by the adjustment of the institutional prices and direct payments set up by the Berlin Agreement. The estimation is conducted using partial equilibrium methodology for the two cases: when a country appears in surplus and in deficit, in a given commodity. The methodology is applied to the case of Greek agriculture.

The analysis shows that consumers' gains are more significant than the loss of producer surplus (Euro 115 million against 82 million). This is a particularly true in the case of beef, cow milk, soft wheat and barley. The opposite holds, however, in the case of durum wheat, maize and sunflower seed. In terms of exchange flows, the adjustments of the institutional prices and direct payments would result in net losses (Euro 62 million), excepting the case of durum wheat.

## **1. Introduction**

At the Berlin Summit in March 1999, EU heads of government reached a global agreement on the reform of the CAP that was proposed by the Commission in the Agenda 2000 reform package. The political agreement concerns the arable crops, beef, milk and wine sectors, the new rural development framework, the horizontal rules for direct schemes and the financing of the CAP. The Berlin CAP reform continues the 1992 approach through further shifts from price support to direct payments and the development of a more integrated rural policy to accompany this process. The reduction in the prices of agricultural products aims at making them more competitive both within the Community and on world markets, and is not fully compensated for by the area or headage payments.

The aim of this paper is to estimate the welfare effects on the producers, consumers and the budgetary, imports and exports flows caused by the adjustment of the institutional prices and direct payments set up by the Berlin Agreement. The estimation is conducted using partial equilibrium methodology for the two cases: when a country appears in surplus and in deficit, in a given commodity. The methodology is applied to the case of Greek agriculture.

The paper consists of five sections. The second section is a review of the new CAP. In the next section we describe analytically the methodology employed. The sources of data used are provided in Section 4 where the results are also presented. Finally, in Section 5, the main findings are summarized and some policy implications are drawn.

## **2. The New CAP**

The wish to help European agriculture to take advantage of the expected positive world market developments, and to facilitate the enlargement of the EU to incorporate up to ten countries of Central and Eastern Europe (along with Cyprus and Malta) stimulated the Commission to come up with a blueprint for those aspects of the EU policy that are most affected by these developments. The blueprint was launched in 1997 as Agenda 2000 (E.C.,1997).The main thrust of the document was that the

budgetary implications of extending the regional and agricultural policies would be insupportable from current resources. Policy changes would be needed prior to enlargement to enable the EU to withstand the expected budgetary shock. Regarding the changes in agriculture policy, the Commission proposes in its Agenda 2000 the deepening and widening of the 1992 reform through further shifts from price support to direct payments and the development of a coherent rural policy to accompany this process. Lower prices will improve the competitiveness of EU agriculture on both domestic and external markets, benefit consumers and leave more room for price differentiation in favour of high quality speciality products. In addition, it will offer the EU increased flexibility in the WTO Round negotiations. Environmental considerations<sup>1</sup> have become a major concern of the CAP which is promoting agricultural practices necessary to safeguard the environment and preserve the countryside (E.C., 1998 and 1999b).

At the Berlin Summit in March 1999, EU heads of government reached a global agreement on the reform of the CAP<sup>2</sup>, which was less ambitious than the proposals of the Commission and the one that emerged from the March 11 Agricultural Council. The main points of the Agreement regarding agriculture are provided in *Agra Europe* (1999) and E.C. (1999a).

The reformed CAP represents a step towards supporting the broader rural economy rather than agricultural production and ensures that farmers are rewarded not only for what they produce but also for their general contribution to society. This means that the policy is targeted not just at agricultural producers but also at the wider rural population, consumers and society as a whole. The political agreement resulted in the adoption of new regulations which came into force (with the exception of milk) from the year 2000 onwards. These concern the arable crops, beef, milk and wine sectors, the new rural development framework, the horizontal rules for direct schemes and the

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<sup>1</sup> Since ratification of the Maastricht Treaty, there has been a legal obligation on the Union to take account of environmental protection requirements when drawing up and implementing Community policies. An obligation which was reinforced by the entry into force of the Treaty of Amsterdam on May 1, 1999.

<sup>2</sup> See e.g. E.C. (1997) and *Agra Europe* (1999).

financing of the CAP. The amended regulations<sup>3</sup> for the olive oil and tobacco sectors are not added to this list, because they were not adopted in the context of the Agenda 2000 reform package. A transitional regime for olive oil was introduced in November 1998 with a view to undertaking wider-ranging reforms in 2001, while a fundamental reform of the tobacco sector has been implemented, aimed at encouraging production of higher quality tobacco varieties in the EU and strengthening environmental protection.

EU leaders have agreed that the CAP budget<sup>4</sup> should remain "stable" over the next seven years. The budget target agreed for the CAP is Euro 40.5 billion a year on average plus 2 per cent inflation, plus Euro 14 billion to be spent on rural development (Table 1). In effect, EU governments have handed over greater fiscal control to the Commission in return for guarantees that spending will not exceed the Euro 40.5 billion target. In order to do so, the Commission will now be forced to watch its expenditure and make early savings in areas such as export refunds and intervention buying, if there is danger of exceeding its remit before the end of any given financial year. To evaluate this, the Council added a demand for a report to be submitted the Commission in 2002 "on the development of agricultural expenditure, accompanied, if necessary, by appropriate proposals".

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<sup>3</sup> *Official Journal of the European Communities*, L 160, 26.06.99/L 179, 14.07.99.

<sup>4</sup> Current budgetary discussions are of particular importance due to the implications the eastern enlargement will have on budgetary balances. During the period 2000-2006, the Commission is not expecting any changes in the relative budgetary position of the current member States. However, a recent discussion of budgetary imbalances in relation to the relative prosperity of member States has drawn attention to the possibility of granting budgetary corrections. In this respect, the performance of the compensation mechanism for the U.K. with the 1984 Fontainebleau Agreement is questioned and the legitimacy of the decision is being reviewed. As the Commission reports, the British rebate distorts the whole system of contribution. The UK has 16.1 per cent of the EU GNP and pays 11.9 per cent of the budget. In contrast, Germany has 26 per cent of the EU GNP and pays 28.2 per cent of the budget costs, Greece 1.5 per cent and 1.65 and France 17.2 per cent and 17.5 per cent respectively. The only other country with a disproportionate share of the budget is Italy with 14.2 per cent and 11.5 per cent (Josling and Babinard, 1999). Germany, as the biggest contributor, wishes to substantially reduce its net contribution to the EU budget from the present 22 billion DM a year. However, the Germans decided eventually to abandon "co-financing", a scheme under which national governments would have shared the costs of subsidizing the agriculture sector in their respective countries.

**Table 1: Planned CAP expenditure 2000-06**  
**(in million Euros, 1999 prices)**

	2000	2001	2002	2003	2004	2005	2006
<b>Heading1 (Agriculture)</b>	<b>40920</b>	<b>42800</b>	<b>43900</b>	<b>43770</b>	<b>42760</b>	<b>41930</b>	<b>41660</b>
CAP expenditure (excluding rural development and accompanying measures)	36620	38480	39570	39430	38410	37570	37290
Rural development and accompanying measures	4300	4320	4330	4340	4350	4360	4370

Source: European Commission, 1999a.

### 3. The Model

The welfare effects from the adjustment of the institutional prices and direct payments introduced by the Berlin Agreement on Greek agriculture will be examined using partial equilibrium methodology. The examination will be conducted for the two cases: when the country appears in surplus and in deficit in a given commodity. A similar methodology was applied in Baltas, (1992).

The analysis that will follow deals with the case when the system of administered prices is applied. It is also applied when agricultural incomes are protected by direct payments<sup>5</sup> (per unit subsidy or some sort of deficiency payments) granted by the Community. The per-unit subsidy has an effect on production but does not affect consumption and consumer expenditure. The effects will be on the producer, consumer, exchange (budgetary) flows, imports and exports. When both systems (administered prices and direct payments) are applied, then the effective income-protection price equals the sum of intervention price and direct payment. Moreover, changes in direct income support are distinguished from changes in floor prices. Thus, the semi-decoupled nature of the CAP direct payments is taken into consideration.

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<sup>5</sup> The analysis ignores the effects of producer support on ancillary agribusiness.

### 3.1 Deficit Product

Figure 1 shows the supply curve  $SS$  and demand curve  $DD$  for a commodity in the domestic market while  $P_w$  is its international price. At the price level  $P_w$ , domestic

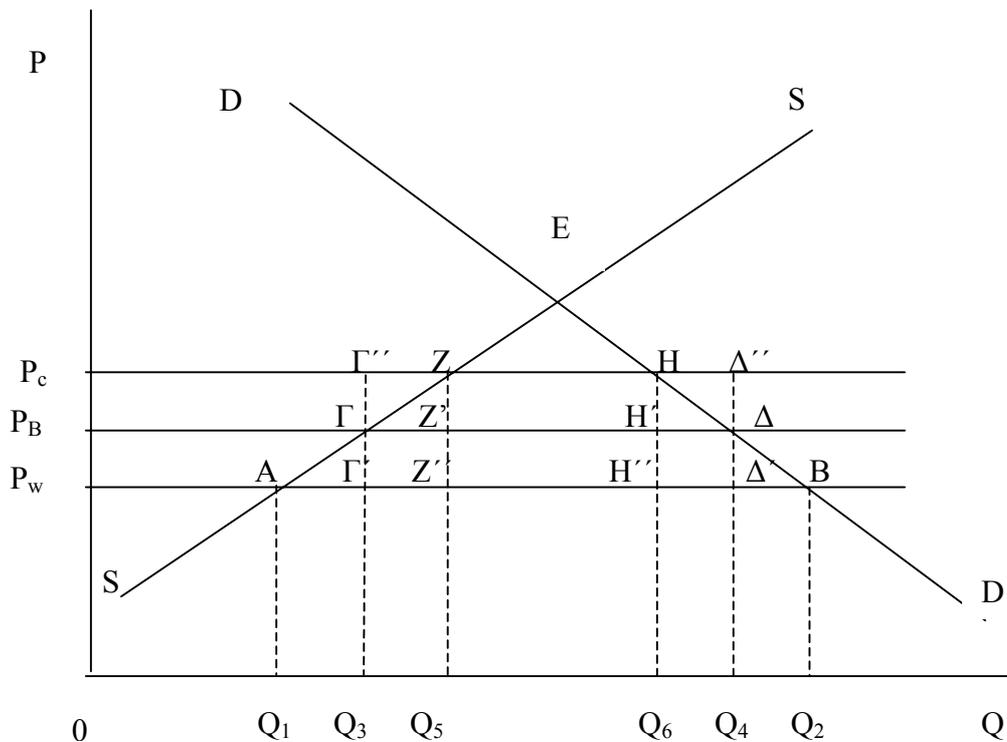


Fig.1

production would be  $Q_1$  and domestic consumption  $Q_2$ . The difference ( $AB = Q_1Q_2$ ) is made up by imports.  $P_c$  is the current institutional price and direct payment set by the Community expressed in Euro and  $P_B$  the lower corresponding institutional price and direct payment set up by the Berlin agreement expressed in Euro. A higher institutional price could be achieved by imposing a higher import levy of  $(P_c - P_w)$ . The higher institutional price  $P_c$  will cause a rise in domestic production by the quantity  $Q_1Q_5$  and in producer surplus equal to the area  $P_wP_cZA$ . The extra production incurs additional costs which partly offset the extra revenue earned as a result of the higher price. Thus, the producer-related welfare triangle loss is equal to the area  $AZZ'$ . Consumers or users of the commodity, on the other hand, lose quantity  $Q_2Q_6$  as a result of the move to the higher price regime and are charged the additional expenditure  $P_wP_cHH'$ . The area  $P_wP_cHB$  represents a measure of the net loss experienced by consumers. Finally, imports will be reduced to the quantity  $Q_5Q_6$ , due to the increase of domestic production and the decrease of consumption.

An adjustment of the institutional prices and direct payments along the lines of the Berlin Agreement will lead to the following results.

### 3.1.1 Production-Producer

Domestic production will decrease by the quantity:

$$Q_3 Q_5 = e_s (P_C - P_B) \frac{Q_5}{P_C}$$

where  $e_s$  is the supply elasticity.

Producer surplus<sup>6</sup> will decrease by the area:

$$\begin{aligned} P_B P_C Z \Gamma &= P_B P_C Z Z' - \Gamma Z Z' = (P_C - P_B) Q_5 - \frac{1}{2} (P_C - P_B) (Q_5 - Q_3) \\ &= (P_C - P_B) Q_5 \left( 1 - \frac{1}{2} e_s \frac{P_C - P_B}{P_C} \right) \end{aligned}$$

### 3.1.2 Consumption-Consumer

Consumption will increase by the quantity:

$$Q_4 Q_6 = e_D (P_C - P_B) \frac{Q_6}{P_C}$$

where  $e_D$  is the demand elasticity. The increase of consumer surplus from the rise in price will be equal to the area  $P_B P_C H H'$  plus the area  $H H' \Delta$ , where:

$$P_B P_C H H' = (P_C - P_B) Q_6$$

and

$$H H' \Delta = \frac{1}{2} e_D (P_C - P_B)^2 \frac{Q_6}{P_C}$$

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<sup>6</sup> The intervention mechanism applies to the whole quantity ( $OQ_5$ ) as long as the new guaranteed price ( $P_C$ ) is higher than the market price. In the case where the market price is higher than the institutional price, the intervention mechanism is not applied and the formulae for surplus measurement are not applicable.

Therefore, the benefit with respect to the consumer surplus will be:

$$P_B P_C H\Delta = (P_C - P_B) Q_6 \left( 1 + \frac{1}{2} e_D \frac{P_C - P_B}{P_C} \right)$$

### 3.1.3 Imports

Imports will be increased (due to the reduction of domestic production and the increase of consumption), by the quantity  $Q_3 Q_5 + Q_4 Q_6$ , which will be equal to:

$$\begin{aligned} \Gamma''Z + H\Delta'' &= Q_3 Q_5 + Q_4 Q_6 \\ &= e_S (P_C - P_B) \frac{Q_5}{P_C} + e_D (P_C - P_B) \frac{Q_6}{P_C} = \frac{P_C - P_B}{P_B} (e_S Q_5 + e_D Q_6) \end{aligned}$$

### 3.1.4 Exchange (budgetary) flows

Due to the price and direct payments adjustment, producer surplus decreases by the amount  $P_B P_C Z \Gamma$ . Consumer surplus is increased by the amount  $P_B P_C H\Delta$ , leaving a net benefit of  $ZH\Delta\Gamma$ .

In terms of budgetary flows, Greece loses  $\Gamma\Gamma''\Delta''\Delta$  while gaining  $\Gamma''ZZ''\Gamma''$  and  $H\Delta''\Delta''H''$ . Combined with the surplus changes, this leaves a net loss of:

$$ZH\Delta\Gamma - \theta (H''\Delta''\Delta''H'' + \Gamma''Z''Z''\Gamma'')$$

$$= (P_C - P_B) \left[ Q_5 Q_6 + \frac{1}{2} \frac{P_C - P_B}{P_C} (e_D Q_6 + e_S Q_5) \right] - \theta \frac{(P_C - P_B)(P_B - P_w)}{P_C} (e_D Q_6 + e_S Q_5)$$

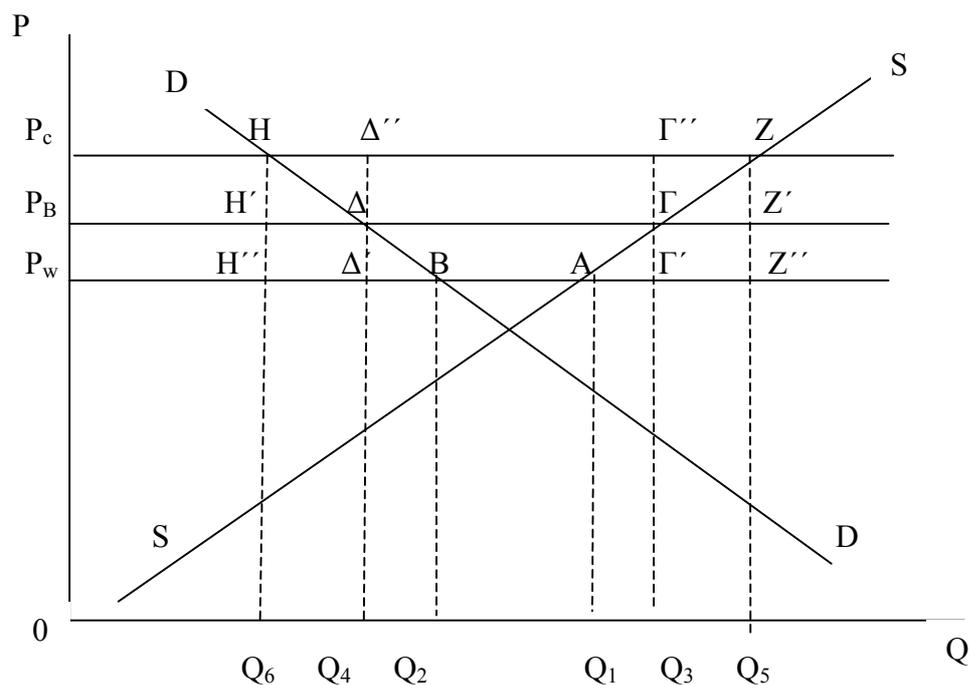


Fig.2

where  $\theta$  is the fraction of Greek imports originating outside the EC. This loss will become greater as  $P_c - P_B$  increases and the supply and demand elasticities decrease.

### 3.2 *Surplus product*

Similar effects will be observed in production/producer and consumption/consumer given a corresponding adjustment of the institutional prices and direct payments (Fig. 2). However, the effects on exports and exchange flows will be different.

#### 3.2.1 *Exports*

New export opportunities<sup>7</sup> will decrease due to the fall of production and to the increase of consumption. This drop of export possibilities will be equal to:

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<sup>7</sup> Possible impact of world market movements and/or policy changes to WTO limits set on subsidised exports and aggregate measured support (AMS) is not taken into consideration, given the insignificant share of greek farm exports in world trade

$$\begin{aligned}
H\Delta'' + \Gamma''Z &= Q_6Q_4 + Q_3Q_5 = e_D(P_C - P_B)\frac{Q_6}{P_C} + e_S(P_C - P_B)\frac{Q_5}{P_C} \\
&= \frac{P_C - P_B}{P_C}(e_DQ_6 + e_SQ_5)
\end{aligned}$$

### 3.2.2 Exchange flows

Following a symmetric analysis with the one described in the importing case, the exchange benefits to Greece will be equal to:

$$ZH\Delta\Gamma - \theta(H'\Delta\Delta'H'' + \Gamma'Z'Z''\Gamma')$$

$$= (P_C - P_B) \left[ Q_5Q_6 - \frac{1}{2} \frac{P_C - P_B}{P_B} (e_DQ_6 + e_SQ_5) \right] - \theta \frac{(P_C - P_B)(P_B - P_W)}{P_C} (e_DQ_6 + e_SQ_5)$$

where  $\theta$  is the fraction of Greek exports outside the EC. The analysis of budgetary flows considers only changes in the uniform producer incentive price, without distinguishing between direct payment flows and the costs of defending institutional prices through market intervention, i.e public stocks, subsidized exports.

## 4. Data

### 4.1 Sources

The model includes all the commodities which are affected by an adjustment of the institutional prices and direct payments. The data employed and the corresponding sources for each of the included commodities are the following:

- Domestic production and consumption-utilisation (Ministry of Agriculture);
- Imports from and exports to EC and third countries (National Statistical Service);
- Domestic prices of agricultural products (Ministry of Agriculture);
- Institutional prices of agricultural products (European Communities);
- Direct payments (European Communities);
- International prices (European Communities, FAO and United States Department of Agriculture).

Table 2: Average long-run supply elasticities for Greek agricultural products

<i>Cereals-Oilseeds</i>	durum wheat	soft wheat	barley	maize	sunflower seed
durum wheat	0.16	-0.02	-0.09	-0.12	-0.08
soft wheat	-0.001	0.25	-0.09	-0.02	-0.05
barley	-0.08	-0.20	0.34	-0.11	-0.04
maize	-0.09	-0.04	-0.09	0.14	-0.09
sunflower seed	-0.12	-0.08	-0.05	-0.09	0.41
<i>Meat</i>	beef/veal	pork	poultry	goat/sheep	
	0.39	-0.29	-0.11	-0.23	
<i>Milk – dairy products</i>	cow milk	goat/sheep milk			
	0.14	-0.001			

Source: Mergos and Karagiannis (2001)

Table 3: Average long-run demand elasticities for Greek agricultural products

<i>Cereals-Oilseeds</i>	durum wheat	soft wheat	barley	maize
durum wheat	-0.13	0.04	0.02	0.01
soft wheat	0.03	-0.12	0.05	0.02
barley	0.01	0.03	-0.31	0.01
maize	0.02	0.01	0.02	-0.11
sunflower seed	olive-oil	maize-oil		
-0.35	0.09	0.16		
<i>Meat</i>	beef/veal	pork	poultry	goat/sheep
	-1.53	0.21	0.03	0.50
<i>Milk – dairy products</i>	cow milk	goat/sheep milk		
	-0.09	0.02		

Source: Mergos and Karagiannis (2001)

For the calculation of supply and demand responses to changes in institutional prices we employed the average long-run supply and demand elasticities (Tables 2 and 3) which derive from Mergos and Karagiannis (2001). The values used here reflect long-run full adjustment responses.

#### *4.2 Empirical results*

We take 1998 as a typical base year of our estimation and, given also that there is no significant variability in world market prices, we assume that the adjustments of the institutional prices and direct payments are realized within one period. The empirical results for all commodities included in the Berlin Agreement appear in Table 3. Starting with cereals, the first thing to mention is that the measure of set-aside has never been applied in the case of Greece due to the small size of greek farms. As far as the effects on durum wheat, a surplus product are concerned, these are relatively substantial given that two mechanisms are used: (a) intervention prices and (b) supplementary direct subsidy. Producer surplus decreases by Euro 11.6 million, and is only partially offset by the gains in consumer surplus (Euro 4.4 million). Potential exports are reduced by 16.9 per cent, while budgetary flows increase by Euro 3.4 million thanks to higher supplementary direct subsidies.

The other cereals are deficit products. The results on soft wheat are rather moderate. The producer surplus lost (Euro 6 million) is lower than the consumer surplus gained (Euro 9.8 million) thanks to the greater quantities of soft wheat consumed compared with other cereals. Imports increase potentially by 3 per cent, whereas exchange flows decrease by Euro 8 million. For barley, the effects are rather negligible given that the loss to the producers is only Euro 3.2 million while the gains of the consumers rise by Euro 5.1 million. Potential imports increase by 9 per cent, while budgetary flows fall by Euro 2.1 million. For maize, the loss of producers' surplus is significant (Euro 18.3 million) due to fact that the quantity produced is greater than that of any other cereal, while the increase of consumer surplus is negligible (Euro 0.2 million). Potential imports are expected to rise by 6 per cent and the exchange flows to be reduced by Euro 4.2 million. This analysis does not distinguish between intra-sectoral (feed) and extra-sectoral (industrial, human consumption) demand.

For sunflower seed, where the intervention mechanism is not applied, the effects can be attributed exclusively to the reduction of direct payments from Euro 349/Ha to 88.8/Ha. Provided that the maximum guaranteed cultivated area does not exceed 2600Ha, producers' surplus and budgetary flows fall by Euro 6.8 million.

In Greece, the protection system for beef is exclusively based on premiums per head, since the intervention mechanism can not be applied given that beef is a highly deficitary product. Following the adjustment, the loss of producers' surplus is negligible while the gains of consumers' surplus are substantial (Euro 16 million) due to the significant reduction of intervention prices by 20 per cent. Potential imports increase by 5.8 per cent, while the exchange flow losses are Euro 5.8 million.

Similar results also hold for cow milk, taking into consideration that the degree of self-sufficiency is only 53 percent. Specifically, the loss of producers' surplus and exchange flows are Euro 36 and 38 million respectively. The gains of consumers' surplus (Euro 79.7 million) outweigh producers' losses. Moreover, the potential increase of imports of cow milk by 110 thousand tonnes should be reduced by 70 thousand tonnes, which is the quantity of the additional production quotas granted to Greece.

Table 4: Empirical results from the adjustments of the institutional prices and direct payments resulting from the Berlin Agreement in the case of Greek Agriculture

Product	Loss of producer surplus (in million Euro)	Gains of consumer surplus (in million Euro)	Imports (in thousand tones)	Exports (in thousand tones)	Exchange flows (in million Euro)
<i>Cereals-oilseeds</i>					
durum wheat	11.64	4.40		-83.52	3.39
soft wheat	5.99	9.81	25.20		-8.02
Barley	3.19	5.12	19.13		-2.07
Maize	18.32	0.23	27.09		-4.22
sunflower seed	6.76				-6.76
<i>Meat</i>					
beef/veal	0.07	15.90	9.31		-5.76
<i>Milk-dairy products</i>					
cow milk	36.37	79.70	109.88		-38.09
<b>Total</b>	<b>82.34</b>	<b>115.16</b>			<b>-61.53</b>

## 5. Concluding Remarks

The progress achieved through the 1992 CAP reform was not sufficient to meet the challenges facing the EU in the light of the WTO negotiations (which would push EU agriculture to a freer trade regime) on the one hand and the EU's enlargement on the other hand. The Commission, having reviewed these prospects and the expected positive world market developments, concluded that the best option was to continue the 1992 approach through further shifts from price support to direct payments and the development of a more integrated rural policy to accompany this process. However, the agreement reached at the recent Berlin Summit is less ambitious than the Commission's proposals included in Agenda 2000. As a result, a delay is expected in the EU's eastward enlargement. The EU's negotiating position in the WTO negotiations will be formulated along the lines of the Berlin Agreement, which falls far short of the Cairn Group objectives regarding the liberalization of international trade in agricultural commodities. More specifically, the approach of the EU to the WTO negotiations can be summarised as follows. On the question of access to the markets, the EU will declare itself against any drastic reduction in tariffs. On export subsidies, it will maintain that these are essential for the clearing of markets, at least for the next few years, while on other issues the EU has already expressed its intention to re-negotiate the Sanitary and Phytosanitary Standards Agreement to take into account situations where consumer concerns are being underplayed by market considerations. Last, since the CAP reform was decided in advance of the next round of WTO negotiations, the changes adopted will reflect clearly the international constraints on the EU and will strengthen the EU negotiating position in the WTO discussions.

After the introduction of the compensatory payments in 1992, a considerable wave of dissent has been rising within the EU on the issue of subsidiarity and on the idea that some elements of the CAP should be financed by national governments. The budget issue is especially controversial due to the differences in the contributions by individual member States and to the impact of CAP on EU expenditure as a whole. Nevertheless, over the next seven years it will be the first time in the EU's history that spending on agriculture will not have shown constant growth in real terms.

With regard to the welfare effects of the Berlin CAP Agreement on Greek agriculture, our analysis shows that consumers' gains are more significant than the loss of producer surplus (Euro 115 million against 82 million). This is particularly true in the case of beef, cow milk, soft wheat and barley. The opposite holds, however, in the case of durum wheat, maize and sunflower seed. In terms of exchange flows, the adjustments of the institutional prices and direct payments would result in net losses (Euro 62 million), excepting the case of durum wheat.

The proposals for the further "greening" of the CAP included in Agenda 2000 have been adopted in the Berlin Agreement. These comprise support and remuneration to farmers for services to the environment as well as for their contribution to the maintenance of the rural heritage within the EU and have encouraged the transformation of the CAP from an essentially agricultural policy to one of environmental and rural development.

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