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Effects of adjustment of the green drachma to its current exchange rate

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ABSTRACT

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Between 1981 and 1988, the drachma has devalued by 62.5% against the ECU. Until mid-1985 any devaluation of the drachma was followed by a corresponding devaluation of the 'green drachma'. After that period, the green rate either remained unchanged or changed by a substantially smaller percentage, resulting in farmers' income loss and consumers' gain.

The aim of this paper is to investigate the welfare effects on production/producer, consumption/consumer and budgetary flows from and to FEOGA assuming that an adjustment of the green drachma to its current exchange rate was realized. For this purpose partial analysis methodology is employed.

The main findings are that, following a simultaneous adjustment of both rates, the gains to producers and in exchange flows more than make up for the corresponding consumers' losses for all products except beef.

1. INTRODUCTION

Between 1981, when Greece joined the EC, and 1988 the drachma has been devalued by 62.5% against the ECU. Its devaluation is even higher (66%) if we take into account the switch-over mechanism. Overall, the drachma's slide has been a gradual one with only two discrete devaluations occurring in the entire period – in January 1983, and again in October 1985, when it lost 16% and 15% of its value overnight.

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In the first years of Greek accession to the EC, until mid-1985, the devaluation of the drachma was followed by a corresponding devaluation of the 'green drachma', so there was no significant divergence between the two exchange rates. After mid-1985, however, the green exchange rate of the drachma has either remained unchanged or changed at a substantially smaller percentage in relation to its current exchange rate, resulting in a divergence which ranged between 15% and 30%. This divergence caused loss to farmers' income and gain for the consumers.

The aim of this paper is to evaluate the effectiveness of the economic policy regarding the green exchange rate of the drachma followed over the period 1981–88. In particular, an attempt is made to investigate the welfare effects on production/producer, consumption/consumer and budgetary flows from and to the European Agricultural Guidance and Guarantee Fund (known generally by its French acronym FEOGA), assuming that an adjustment of the exchange rate of the green drachma to its current exchange rate was realized. For this purpose partial analysis methodology is employed.

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

2. REVIEW OF LITERATURE

Literature relating to the welfare effects of the adjustment of a currency's green exchange rate to its current exchange rate is rather limited. Existing studies can be classified into three broad categories.

Firstly, there are those which describe the developments of Monetary Compensatory Amounts (MCAs [1]) and the associated changes in definition of the unit of account, i.e. CEC (1987), Irving and Fearn (1975), Josling and

[1] Under the Common Agricultural Policy (CAP), support prices of agricultural commodities are set at common levels in terms of an agricultural unit of account. These prices are converted into national prices using, not the market rates of exchange between the ECU and the respective member countries' national currencies, but the artificial green rates, in order to insulate farmers as well as consumers from the effects of fluctuations in the market rates. Green rates, in effect, give member governments some discretionary power in determining national farm support levels according to their priorities regarding inflation and farm incomes. They necessitated, however, the introduction of the MCAs in order to prevent disruption of the common prices system whenever the green rate differed from the market rate.

Harris (1976), Heidhues, Josling, Ritson and Tangermann (1978), Swinbank (1980), Strauss (1983) and the Agra Europe Publication (1986).

Second, there are studies which measure the costs of the CAP and the inter-country transfers that occur as a result of common price increases and changes in the level of MCAs. These studies use a broadly similar analytical framework, but because they use different, though reasonable, data bases the overall results differ. Little comparison is possible between the studies evaluating MCA changes because they are based on different time periods when different MCAs were applied.

The Cambridge Economic Policy Group have produced a series of estimates of the costs of the CAP (1979; McFarquhar et al., 1977; Bacon et al., 1978) all of which concentrate on budget and trade effects. Rollo and Warwick (1979) present an alternative calculation similar to the Cambridge Economic Policy Group but avoiding double counting of MCA payments. The analysis is applied to the two years 1977 and 1978 for more commodities.

Tangermann (1979), in the appendix to a study assessing Germany's role within the CAP, presents some results analysing the effects of abolishing MCAs. Tangermann's model includes eight products (grain, sugar, beef and veal, pork, poultry, eggs and milk). The elasticities used are 0.7 for supply and -0.2 for demand. Tangermann's estimates of the abolition of MCAs, though they are comparable with those of the Cambridge Economic Policy Group given that they apply to the same time period differ from the latter in several respects. He also provides estimates of the effects of a one-percent devaluation of the green pound.

The study by Schmitz (1979) contains an analysis of the effect on Germany, France and the United Kingdom of price harmonisation at the common EC price level in 1976. Because different MCAs are applied this study is not directly comparable with Tangermann or the Cambridge Economic Policy Group. The model incorporates the following seven commodities: soft wheat, barley, white sugar, butter, pork and skim milk powder. Schmitz uses demand elasticities between -0.15 and -0.6 and supply elasticities of 0.3 or 0.4.

In their economic and political analysis of the MCA system, Ritson and Tangermann (1979) suggest that the MCA mechanism may be flexible enough to allow member countries to move towards their individual domestic agricultural policy objectives. A country would be expected to desire higher agricultural prices if it is a net exporter, has a poor farm structure, and/or has a high average non-farm income level. A country-by-country appraisal reveals that these conditions are more prevalent in high positive MCA countries than in countries which have negative MCAs. The second part of their study is a geometric analysis of the MCA system into which

has been built the terms of trade effect of EC exports to the rest of the world.

Buckwell, Harvey, Thomson and Parton (1982) examine the market and budgetary effects of both the present CAP and certain alternative policies. The calculations concern the physical and financial flows occurring under the 'base' policy corresponding to the CAP in 1980 and the four specified alternative policies, among them, the budgetary effect from the elimination of MCA payments and receipts. The model used is composed of a set of conventional partial equilibrium, supply-and-demand equations for each of sixteen agricultural commodities in each of the eight Community members (Luxembourg being included with Belgium).

Third, there are some studies which deal with only certain aspects of MCAs. Loseby and Venzi (1978) investigate whether there is any evidence to show that MCAs have favoured the competitive position of strong-currency countries' exports and hindered those from weak areas. The results seem to indicate that MCAs have indeed had an effect on the competitive position of member countries' agricultural exports.

Peters (1980) presents a simplified expository analysis for the 'green pound'. Parsons (1981) develops a diagrammatic model which shows the effects on domestic production, consumers' welfare, the EC farm budget and British trade caused by operating the CAP with non-automatic alignment of 'spot' and 'green' sterling exchange rates and allowing for domestic agricultural productivity growth and/or growth in domestic productive resources.

Ritson (1978) has provided some analytical clarification concerning the relationship between a change in the 'green pound' and the UK balance of payments. Its main conclusion is that, although a devaluation of the green pound will probably make a positive contribution to the balance of payments, it is a relatively inefficient method of doing so.

MacLaren (1982) demonstrates how certain aspects of the agrimonetary system of the CAP may be analysed using a spatial equilibrium diagram. The results of the graphical analysis show that, firstly, when the intervention price is below the market price both the importing and exporting country gain in social welfare and, second, when the intervention price is effective only the importing country gains. However, in both cases the welfare gains are less than the cost of the MCAs.

A final point that ought to be made in closing this section is that the introduction of the MCAs was criticised on several grounds. The main points of this criticism referred, firstly, to the increased burden placed on the Community Budget and, second, to the fact that some countries, i.e. Germany and the Netherlands, had been using the MCA mechanism as a means of artificially raising the competitiveness of their agricultural exports

thus benefiting their farmers' income. As a result, in 1984 the decision was taken to abolish positive MCAs and replace them with negative MCAs using the switch-over mechanism which expresses the percentage revaluation of the strongest national currency (the DM) against the ECU. Thus, the MCAs are calculated on the basis of the difference between a national currency's green rate and its current exchange rate adjusted by the switch-over factor. This new mechanism, however, did not overcome the problem since it, too, is dependent on a revalued DM and its consequences. To rectify this situation the Council reached certain decisions in 1987 concerning the gradual elimination of the MCAs created after each currency realignment. These, however, have not been acted upon yet.

3. THE MODEL

The effects from the adjustment of the exchange rate of the green drachma to its current exchange rate will be examined using partial equilibrium methodology. The examination will be conducted for the two cases: when the country appears in surplus, or in deficit, in a given commodity.

The analysis that will follow deals, not only with the case when the system of administered prices is applied, but also in cases where there is no price intervention mechanism and prices are determined freely in the market or the market price is higher than the institutional price and the intervention mechanism does not play any role. In both cases agricultural incomes are protected by direct income subsidies [2] (per unit subsidy or some sort of deficiency payments) granted by the Community. The per-unit subsidy has an effect on production since green rates are used to convert subsidy amounts denominated in ECU into drachma. It should be pointed out that the elimination of any divergency between current and exchange

[2] The analysis ignores the effects of producer support on ancillary agribusiness. A further simplification of the analysis is to treat the supply and demand of each commodity as if quantities were unaffected by changes in the prices of other commodities. These 'cross-price' effects may be significant in the case of intermediate or competitive products, when the prices of some commodities change simultaneously. The inclusion of cross-price elasticities which quantify such effects creates a problem in the correct measurement of consumer and producer effects. However, the theoretical difficulty is not insuperable (see Just et al., 1982). Apart from the theoretical difficulty information is not available on cross-price elasticities for the majority of commodities. The effects of an abolition of MCAs on production and consumption are not being directly estimated because the analysis would become very complicated. On the other hand, those on consumers and exchange flows are taken into account. Moreover, for the great majority of products Greece is in surplus and any disposable quantities are exported.

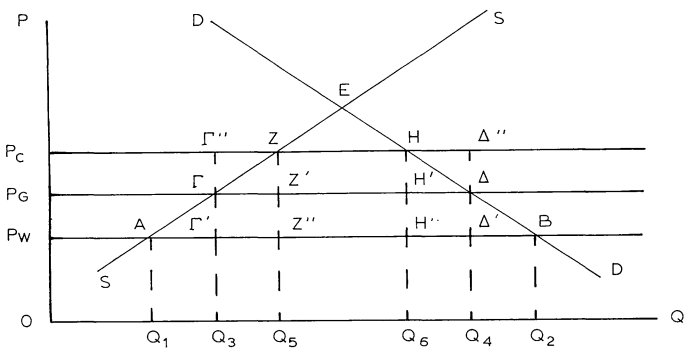

Fig. 1.

rate will not be followed by any change in consumption and consumer expenditure. The effects will be on the production/producer and exchange flows. When both systems (administered prices and direct income subsidies) are applied, then the effective income-protection price equals the sum of intervention price and income subsidy.

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 production would be Q_1 and domestic consumption Q_2. The difference ($AB = Q_1Q_2$) is made up by imports. P_G is the institutional price set by the Community expressed in drachmas by using the green exchange rate, and P_C the higher corresponding price expressed in the current exchange rate. A higher institutional price could be achieved by imposing a higher import levy of ($P_G - P_W$). The higher institutional price P_G will cause a rise of domestic production by the quantity Q_1Q_3 and of producer surplus equal to the area $P_WP_G\Gamma A$. 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 $A\Gamma\Gamma'$. Consumers or users of the commodity, on the other hand, lose quantity Q_2Q_4 as a result of the move to the higher price regime and are charged by the additional expenditure $P_WP_G\Delta\Delta'$. The area $P_WP_G\Delta B$ represents a measurement of the net loss which consumers experience. Finally, imports will be reduced to the quantity Q_3Q_4, due to the increase of domestic production and the decrease of consumption.

An adjustment of the green exchange rate of the drachma to its current exchange rate will lead to the following results.

3.1.1 Production–Producer

Domestic production will increase by the quantity:

$$Q_3Q_5 = e_S(P_C - P_G)\frac{Q_3}{P_G}$$

where e_S is the supply elasticity.

Producer surplus [3] will increase by the area:

$$P_GP_CZ\Gamma = P_GP_CZZ' - \Gamma ZZ' = (P_C - P_G)Q_5 - \frac{1}{2}(P_C - P_G)(Q_5 - Q_3)$$

$$= (P_C - P_G)Q_3\left(1 + \frac{1}{2}e_S\frac{P_C - P_G}{P_G}\right)$$

3.1.2 Consumption–Consumer

Consumption will decrease by the quantity:

$$Q_4Q_6 = e_D(P_C - P_G)\frac{Q_4}{P_G}$$

where e_D is the demand elasticity. The loss of consumer surplus [4] from the rise in price will be equal to the area P_GP_CHH' plus the area $HH'\Delta$, where:

$$P_GP_CHH' = (P_C - P_G)Q_4\left(1 - e_D\frac{P_C - P_G}{P_G}\right)$$

and

$$HH'\Delta = \frac{1}{2}e_D(P_C - P_G)^2\frac{Q_4}{P_G}$$

[3] 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 used.

[4] In the case where adjustment of the green drachma implies results only from abolition of the MCAs imposed on imports from other EEC countries and third countries, then the loss of consumer surplus is equal to the community's subsidization:

$$\Gamma\Gamma'\,'\Delta'\,'\Delta = (P_C - P_G)(Q_4 - Q_3) = (P_C - P_G)Q_3Q_4$$

In a longer period due to the abolition of the MCAs it is expected that a price-quantity adjustment will occur and the loss of consumer surplus is no longer rectangular.

Therefore, the loss of consumer surplus will be:

$$P_G P_C H\Delta = (P_C - P_G)Q_4\left(1 - \frac{1}{2}e_D\frac{P_C - P_G}{P_G}\right)$$

3.1.3 Imports

Imports will be reduced (due to the rise of domestic production and the decrease of consumption), by the quantity: $Q_3Q_5 + Q_4Q_6$. Remaining imports are given by the quantity:

$$ZH = Q_5Q_6 = Q_3Q_4 - Q_3Q_5 - Q_4Q_6$$
$$= Q_3Q_4 - e_S(P_C - P_G)\frac{Q_3}{P_G} - e_D(P_C - P_G)\frac{Q_4}{P_G}$$

3.1.4 Exchange (budgetary) flows

Due to green rate devaluation, producer surplus increases by the amount $P_G P_C Z\Gamma$. Consumer surplus is reduced by the amount $P_G P_C H\Delta$, leaving a net loss of $ZH\Delta\Gamma$. Prior to devaluation, Greece received MCA import subsidies, which are uniformly applied to EEC and non-EEC countries, in the amount of $(1-\beta)^*(\Gamma\Gamma'\ '\Delta'\ '\Delta)$, where β is the Greek share in FEOGA financing. At the same time, Greece had to forfeit import levies in the amount of $\Gamma'\Gamma'\ '\Delta'\ '\Delta'$ to the EC. Following devaluation of the green drachma, Greece no longer receives MCA subsidies and forfeits import levies in the amount of $ZHH'\ 'Z'\ '$.

Since Greece's β is negligible this means Greece loses $\Gamma\Gamma'\ '\Delta'\ '\Delta$ while gaining $\Gamma'\ 'ZZ'\ '\Gamma'$ and $H\Delta'\ '\Delta'H'\ '$. Combined with the surplus changes [5] this leaves a net loss of:

$$(ZH\Delta\Gamma + ZHH'Z') - \theta(H'\Delta\Delta'H'\ ' + \Gamma Z'Z'\ '\Gamma')$$
$$= 2(P_C - P_G)\left[Q_3Q_4 - \frac{3}{4}\frac{P_C - P_G}{P_G}(e_DQ_4 + e_SQ_3)\right]$$
$$- \theta\frac{(P_C - P_G)(P_G - P_W)}{P_G}(e_DQ_4 + e_SQ_3)$$

[5] In the case where agricultural income is protected by direct income subsidies the net loss of exchange flows is:

$$ZZ'\Delta\Delta'\ ' - P_C P_G\Gamma Z - \theta\Gamma Z'Z'\ '\Gamma'$$
$$= (P_C - P_G)\left[Q_3Q_4 - Q_3 - \frac{3}{2}(P_C - P_G)\frac{Q_3}{P_G}\right] - \theta e_S(P_C - P_G)(P_G - P_W)\frac{Q_3}{P_G}$$

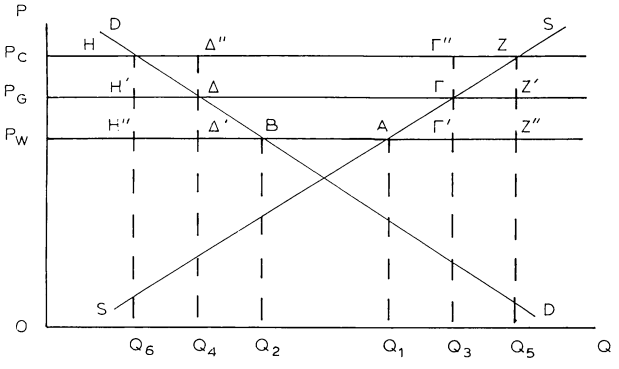

Fig. 2.

where θ is the fraction of Greek imports originating outside the EC. This loss will become greater as $P_C - P_G$ increases and the supply and demand elasticities decrease. Generally it seems likely that Greece loses for goods which it imports and gains for those which it exports (since it saves MCAs export taxes and can take advantage of the fact that the other EC members will finance its export subsidies).

3.2 Surplus product

Parallel effects will be observed in production/producer and consumption/consumer [6] given an adjustment of the green exchange rate to its current exchange rate (Fig. 2). However, the effects, on exports and exchange flows will be different.

3.2.1 Exports

New export possibilities will arise due to the increase of production and to the reduction of consumption. Exports will be free from negative MCAs, assuming they existed for a particular product. In the case of exports to third countries these will be subsidized by the difference $P_C - P_W$. The rise of export possibilities will be equal to:

$$H\Delta'' + \Gamma'' Z = Q_4Q_6 + Q_3Q_5 = e_D(P_C - P_G)\frac{Q_4}{P_G} + e_S(P_C - P_G)\frac{Q_3}{P_G}$$

$$= \frac{P_C - P_G}{P_G}(e_DQ_4 + e_SQ_3)$$

[6] In the the case of surplus product the existence of an MCA component does not have a direct effect on the loss of consumer surplus.

3.2.2 Exchange flows

Following a symmetric analysis [7] with the one described in the importing case the exchange benefits to Greece will be equal to:

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

$$= 2(P_C - P_G)\left[Q_3Q_4 + \frac{3}{4}\frac{(P_C - P_G)}{P_G}(e_DQ_4 + e_SQ_3)\right]$$

$$- \theta\frac{(P_C - P_G)(P_G - P_W)}{P_G}(e_DQ_4 + e_SQ_3)$$

where θ is the fraction of Greek exports outside the EC.

4. DATA

4.1 Sources

The model includes all the commodities (34) which are affected by an adjustment of the green drachma. For each of the included commodities data is assembled for the period 1981–1988. The data employed and the corresponding sources are the following:

- domestic production and consumption-utilisation (Ministry of Agriculture);
- imports from, and exports to, EEC countries and third countries (National Statistical Service);
- domestic prices of agricultural products (Ministry of Agriculture);
- institutional prices of agricultural products (European Communities);
- income subsidies (Ministry of Agriculture);
- current exchange rates between drachma and ECU (Bank of Greece);
- green exchange rates between drachma and ECU taking into account the switch-over mechanism (European Communities);
- international prices (European Communities, FAO and United States Department of Agriculture).

For the calculation of supply and demand responses to changes in institutional prices we employed the average long-run supply and demand

[7] In the case where agricultural income is protected by direct income subsidies the net gain of exchange flows is

$$ZZ'\Delta\Delta'' + P_CP_G\Gamma Z - \theta\Gamma Z'Z''\Gamma''$$

$$= (P_C - P_G)\left[Q_3Q_4 + Q_3 + \frac{1}{2}(P_C - P_G)\frac{Q_3}{P_G}\right] - \theta e_S(P_C - P_G)(P_G - P_W)\frac{Q_3}{P_G}$$

TABLE 1

Average long-run supply and demand elasticities for Greek agricultural products

Product	Supply	Demand
Cereals		
soft wheat	0.4	−0.2
durum wheat	1.1	−0.3
barley	0.4	−0.4
maize	1.2	−0.6
rice	0.25	−0.4
Fresh fruit		
peaches	0.9	−0.9
apples	0.7	−1.15
apricots	1.0	−1.3
oranges	0.2	−0.7
lemons	0.5	−0.4
Processed foods		
olive-oil	0.6	−0.7
wine	0.5	−0.6
sultana	0.6	−0.6
currant	0.4	−0.4
figs	0.3	−0.3
canned peaches	1.2	−1.0
orange juice	0.6	−0.8
lemon juice	0.5	−0.7
tomato puree	1.0	−0.3
Industrial crops		
sugar beets (sugar)	0.9	−0.2
tobacco	1.5	−0.5
cotton	1.2	−0.6
sunflower seed	1.0	−1.0
Meat		
beef/veal	0.7	−1.6
goat	0.7	−1.0
lamb	0.7	−0.8
pork	1.6	−1.7
chicken	1.6	−1.9
Eggs	2.5	−0.4
Milk-dairy products		
fresh milk and skim		
milk powder	0.7	−0.5
condensed milk	1.0	−1.2
butter	1.0	−1.0
cheese	0.3	−0.3

elasticities. (See Table 1 which contains the elasticities of all commodities, though not all are utilized in the actual analysis, however.) In choosing these values, we took into account all the published research [8] – to the best of our knowledge – regarding the supply and demand of Greek commodities. The values used here reflect long-run full adjustment responses, though it would be preferable to have the elasticities for each year separately. Obviously, such a task requires great effort and lies beyond the scope of this paper.

In order to measure the adjustment effects of the green drachma to its current exchange for the whole period (1981–88) the items related to producer surplus and exchange flows have been converted to constant 1988 prices using the index of prices received by farmers. The items related to consumer surplus have been deflated by the consumer price index. Both indices come from the National Statistical Service.

For the estimation of MCAs a deficit (surplus) product is considered as any commodity whose imports are greater (less) than its exports in a particular year.

4.2 Empirical results

The first thing to note is that the effects from the adjustment of the green drachma to its current exchange, though they cannot be seen in the aggregate table, are particularly significant for the years 1986, 1987 and 1988, when there was a substantial divergence between these two rates. The empirical results for all commodities appear in Table 2. As far as the effects on soft wheat are concerned, these are rather moderate since the intervention mechanism was only used in 1982 and the divergency of the two rates was quite small. The most significant result comes mainly from the abolition of the MCAs [9], which amount to 6.6 billion drachmae at constant 1988 prices over the period 1981–88. Abolition causes consumer surplus and the exchange flows decrease by 1.2 billion and 7.9 billion, respectively.

The results on durum wheat, a surplus product, are rather substantial given that two mechanisms were used: (a) intervention prices, which were applied in 1981, 1982 and 1984, and (b) income subsidies which were introduced in 1982. Output increases by 1.8% of the total production for

[8] A few examples for the interested reader are cited: Christou and Sarris (1980); Baltas (1980); Sakellis (1982); Baltas (1987); Baltas and Apostolou (1988).

[9] The analysis refers to a hypothetical elimination in MCAs over the period.
billion = 10^{12}.

TABLE 2

Empirical results (in billion drachmae) for the 1981–88 period (at constant 1988 prices)

Product	Producer surplus	Abolition of MCAs	Loss of consumer surplus due to the abolition of MCAs	Loss of consumer surplus	Exchange flows	Storage [a] expenditure	Export [a] restitutions
Cereals							
soft wheat	−1.18	−6.64	5.84	4.89	−7.95		
durum wheat	3.88	11.03	–	−0.22	6.11	1.79	2.95
barley		−2.55		−2.55	−1.24		
maize		0.04		1.79	−0.07		
rice	0.04				0.04		0.06
Fresh fruits							
peaches	7.73			1.55	5.89		
apples	4.05			2.19	2.08		
apricots	2.10			0.12	1.50		3.55
oranges	8.18			2.61	4.95		
lemons	1.86			0.76	0.56		
Processed foods							
olive-oil	24.27	13.29	–	13.01	35.35	11.63 [b]	0.47
wine		17.10	–		24.23	1.25	0.38
sultana	9.51			0.72	12.61		
currant	9.31			0.44	10.67	9.9	
figs	0.88			0.11	0.71		
canned peaches	7.11				8.25		0.47
orange juice	1.62				0.35		
lemon juice	0.54				0.29	1.02	
tomato puree	6.88				3.28	3.91	
Industrial crops							
sugar beets (sugar)	9.68	−3.59	3.81	3.81	−2.14	0.51	0.02
tobacco	86.59			6.94	68.86	1.96	1.39
cotton	38.90				48.01		
sunflower seed	2.28				1.33		

TABLE 2 (continued)

Product	Producer surplus	Abolition of MCAs	Loss of consumer surplus due to the abolition of MCAs	Loss of consumer surplus	Exchange flows	Storage [a] expenditure	Export [a] restitutions
Meat							
beef/ veal	1.18	−70.64	70.64	71.03	−64.69	0.003	0.002
goat	3.20				3.28		
lamb	6.13				5.83		
pork		−24.05	24.05	24.05	−18.01		
chicken		−1.08	1.07	1.07	−0.53		0.005
Eggs		−0.75	0.75	0.75	−0.35		
Milk-dairy products							
fresh milk and skim milk powder		−4.90	4.90	4.90	−8.01		
condensed milk		−25.81	25.81	25.81	−29.52	0.03	0.37
butter		−2.77	2.77	2.77	−1.47		
cheese		−12.64	12.64	12.64	−4.99		
Total	234.74	−113.56	152.28	179.19	105.21	32.313	9.667

[a] The amounts of the last two columns are ex post, provided by the Ministry of Agriculture.
[b] Including 6.05 billion drachmae consumption subsidies.

the period 1981–88, while producers' surplus [10] rises by 3.9 billion drachmae. The effect on the consumer is negligible while the gains in exchange flows are 6.1 billion drachmae, thanks to higher income subsidies and the abolition of MCAs.

For barley and maize the only influence is due to the abolition of MCAs. The consumer surplus for barley, a deficit product, is reduced by 2.6 billion drachmae and the exchange flows by −1.2 billion. For maize, which was a surplus product only in 1986, the loss of consumer surplus amounts to 1.8 billion drachmae while the losses in exchange flows are negligible. Additional benefits in exchange flows related to cereals derived from increased storage expenditure, etc., and export restitutions, which are estimated at 1.8 and 3 billion drachmae respectively.

[10] Due to the exclusion of cross price effects it is likely that an underestimation of producer surplus occurs for durum wheat vis-a-vis an underestimation for soft wheat, because of the stronger protection system that holds for the former.

The effects on rice are due to the income subsidies, which were introduced in 1988 for the Indica variety. In this case, producer surplus increases by 0.04 billion drachmae and export restitutions by 0.06 billion.

The effects of adjustment on fresh fruits are due to the withdrawal mechanism which operated throughout the entire period for peaches and apples, and for certain years in the case of the other fruits. The estimation of the effects of price changes on the output of the tree crops is an extremely complicated task, which has not yet been solved satisfactorily even on a theoretical basis, given the difficulty in formulating a satisfactory model for the formation of price expectations. Moreover, it presupposes knowledge of prices for many years, for which there were no institutional prices. Because of these difficulties we employed the prices [11] of the previous year, which are reasonably assumed to exert some influence on producers' cultivation practices in the succeeding year and hence on the output of that year, though the shortcomings of this choice are not ignored. The adjustment causes an increase of producer surplus by 7.7 billion drachmae for peaches, 4.1 billion for apples, 2.1 billion for apricots, 8.2 billion for oranges and 1.9 billion for lemons. The loss of consumer surplus [12] and the corresponding gains in exchange flows are: 1.6 and 5.9 billion drachmae, 2.2 and 2.1, 0.1 and 1.5, 2.6 and 5 and 0.8 and 0.6. It is obvious that gains to producers and in exchange flows more than make up for the corresponding consumer losses. To complete the calculation, the amount of 3.55 billion drachmae, representing export restitutions, should be added to the 8.7 billion drachmae of total exchange flows.

The effects of adjustment in the case of olive-oil are due to the changes in intervention prices, which were applied throughout the period except in 1987 and 1988, and in income subsidies (of a type similar to deficiency payments). Producer surplus is 24.3 billion drachmae, while the loss of consumer surplus is 13 billion with a corresponding decrease of 1.8% of consumption over the whole period. The benefits in terms of exchange flows from the elimination of MCAs, and from the additional income subsidies and larger quantities, are 35.4 billion drachmae. To this amount

[11] Obviously, the prices of the previous year are employed for the estimation of the output of the annual crops, as well as for eggs, beef, pork, milk and dairy products. For poultry meat the current prices are used, while for goat and lamb meat those of two years before. In any case, for the estimation of producer surplus current prices are taken into account.

[12] The omission of cross-price effects in the measurement of consumer surplus for fresh fruits could be considered as rather negligible due to the fact that the main bulk of their output is not produced in the same months with the exception of apricots, however, with a relative small output.

an additional 12.1 billion drachmae should be added for storage costs, exports restitutions and consumption subsidies.

The effects on wine are exclusively due to the abolition of MCAs. These amount to 17.1 billion drachmae while the gains in exchange flows are 24.2 billion. Moreover, an additional amount of 1.6 billion drachmae should be added to account for storage costs and export restitutions.

In the case of fresh fruit bought by industry for processing, the support mechanism takes the form of direct subsidies to the processors, provided they pay producers a minimum guaranteed price set by the Community. As a result of the adjustment, the exchange flows from these subsidies increase by 15.0 billion drachmae. The producer surplus and the corresponding gains in exchange flows are: 9.5 and 12.6 billion drachmae for sultana, 9.3 and 10.7 billion for currant, 0.9 and 0.7 billion for figs, 7.1 and 8.3 billion for canned peaches, 1.6 and 0.4 billion for orange juice, 0.5 and 0.3 billion for lemon juice and 6.9 and 3.3 billion for industrial tomato. The loss of consumer surplus for the first three products, for which data are available, is 0.7, 0.4 and 0.1 billion drachmae.

The effects of adjustment on sugar beets come from changes in minimum guaranteed prices. Output increases by 4.4% with a respective rise of producer surplus by 9.7 billion drachmae. On the other hand, the loss of consumer surplus on sugar amounts to 3.8 billion drachmae and of the exchange flows to 2.1 billion. The loss of consumer surplus would be higher if the adjustment of sugar beet prices, which, however, represent only one tenth of the price of sugar, were taken into account. An additional 0.5 billion drachmae can be added to the exchange flows as a result of the corresponding increase in storage costs.

The effects on tobacco are attributed to the intervention system and the guaranteed income subsidies in force. On the side of production/producer they are very significant. Output increases by 10%, while the gains in terms of farmer surplus are 86.6 billion drachmae. On the side of consumption, the loss of consumer surplus is 6.9 billion drachmae. The gains in terms of exchange flows, due to the higher institutional prices and income subsidies, are 68.9 billion drachmae while storage expenditure and export restitutions rise by 2 and 1.4 billion drachmae, respectively.

For cotton and sunflower seed the guaranteed price system and the intervention mechanism are applied, respectively. However, they were not actually used. Thus, the effects can be chiefly attributed to the income subsidies. Cotton output increases by 6.8% and that of sunflower seed by 2.0%. The corresponding producers surplus and exchange flows increase by 38.9 and 48 billion drachmae for cotton and 2.3 and 1.3 billion for sunflower seed.

The protection system for beef is mainly based on income subsidies and

MCAs. The withdrawal mechanism was only applied for a small quantity in 1983. Following the adjustment, the increase in output is negligible while the producer surplus [13] amounts to 1.2 billion drachmae. However, the abolition of MCAs places a much greater burden on the consumer (70.6 billion). The exchange flow losses, given that beef is a highly deficit product, are 64.7 billion drachmae. Export restitutions, which periodically are applied to the small quantities exported, and storage expenditure are negligible.

The effects on goat and lamb meat are exclusively due to the income subsidies which were introduced in 1986 and 1982, respectively. The corresponding gains in producer surplus are 3.2 and 6.1 billion drachmae, which are almost equal to the exchange flows gains.

For pork, chicken and eggs the adjustment of the green drachma causes the elimination of MCAs and a corresponding loss of consumer surplus and a decrease in exchange flows, since they are all deficit products. The relevant amounts are 24.1 and 18 billion drachmae for pork, 1.1 and 0.5 billion for chicken and 0.8 and 0.4 billion for eggs. The export restitutions for the small quantities of chickens occasionally exported are negligible.

The same results also hold for milk and dairy products. Specifically, the relative amounts of the loss of consumer surplus and exchange flows are 4.9 and 8 billion drachmae for fresh milk and skim milk powder, 25.8 and 29.5 billion for condensed milk, 2.8 and 1.5 billion for butter and 12.6 and 5 billion for cheese. Moreover, storage expenditure and export restitutions increase by 0.33 and 0.37 billion drachmae respectively.

5. CONCLUDING REMARKS

In conclusion, our analysis shows that producers' gains (including storage expenditure) are more significant than the loss of consumers surplus (261 billion drachmae against 179 billion, of which 152.28 billion is due to the

[13] It should be noted that the omission of an animal feed variable from the analysis and the consequent disregard of cross price effects results in a positive bias in the measurement of livestock producer surplus. Moreover, this has a limited effect on the results obtained given that in Greece goats and sheep are almost exclusively fed by free grazing, the cost of which is not affected by adjustments to the green drachma rate. The same holds to a lesser extent for cattle which are also fed with concentrated feedstuffs, the main component of which is maize. Pigs and poultry on the other hand are exclusively raised on concentrated feed. A positive bias also exists in the measurement of consumer surplus for meats. This bias is rather insignificant, because there is not much substitution between red meats (beef/veal, goat and lamb) due to strong consumer preferences for certain types of red meats. The same is also true for white meats (pork and chicken) where there also exist considerable differences between these two types of meats.

abolition of MCAs, respectively). This is particularly true in the case of crop production (tobacco, cotton, olive oil, sugar beets, raisins, etc). The opposite holds, however, in the case of beef, pork and dairy products. In terms of exchange flows, an adjustment of the green drachma would generally result in considerable gains (147 billion drachmae) excepting the case of beef, pork and dairy products. An additional 24.3 billion drachmae can be added to the exchange flows for structural expenditure from the Guidance Section of the FEOGA.

In terms of policy recommendations, the foregoing analysis points to the need for a policy of differentiated green rates. This differentiation, however, should aim at a convergence of green and current exchange rates in the case of crop production and the maintenance of the divergence of the rates in the case of beef, pork and dairy products with a corresponding increase in the income subsidization of animal farmers.

Finally, it must be said that the MCAs are to be abolished after 1992, although there seems to be considerable resistance on the part of those member countries which benefit from their existence. In this sense the findings of the present study are of practical interest in adopting a more rational farm prices policy after that date. On the other hand, the MCA issue is only part of the more general problem raised by the existence of differences between green and current exchange rates. These will persist as long as the drachma is kept outside the ERM (Exchange Rate Mechanism).

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REFERENCES

Agra Europe, 1986. Proceedings of the Agrimoney Conference. Special Report 33, London.

Bacon, R., Codley, W. and McFarquhar, A., 1978. The direct cost to Britain of belonging to the EEC, In: Cambridge Economic Policy Review, 4. Gower, Cambridge.

Baltas, N.C., 1980. An empirical investigation of the production and trade of Greek peaches. Oxford Agrar. Stud., 9: 89–114.

Baltas, N.C., 1987. Supply response for Greek cereals. Eur. Rev. Agric. Econ., 14: 195–220.

Baltas, N.C. and Apostolou, N., 1988. A rational expectations model for the poultry sector in Greece. Appl. Econ., 20: 917–927.

Buckwell, A.E., Harvey, D.R., Thomson, K.J. and Parton, K.A., 1982. The costs of the common agricultural policy. Croom Helm, London/Canberra.
Cambridge Economic Policy Group, 1979. Policies of the EEC. In: Cambridge Economic Policy Review, 5. Gower, Cambridge.
CEC, 1987. Economic effects of the agrimonetary system. Com(87) 64, Commission of the European Communities, Brussels.
Christou, K.D. and Sarris, A.S., 1980. The impact on Greek agriculture from membership in European Economic Community. Eur. Econ. Rev., 14: 159–188.
Heidhues, T., Josling, T.E., Ritson, C. and Tangermann, S., 1978. Common prices and Europe's farm policy. Thames Essay, 14. Trade Policy Research Centre, London.
Irving, R.W. and Fearne, H.A., 1975. Green money and the common agricultural policy. Centre for European Agricultural Studies, Wye College, Ashford, Kent.
Josling, T. and Harris, W., 1976. Europe's green money. Three Banks Rev. 109, London.
Just, R., Hueth, D. and Schmitz, A., 1982. Applied Welfare Economics and Public Policy, Prentice-Hall, Englewood Cliffs, NJ.
Loseby, M. and Venzi, L., 1978. The effects of MCA's on EC trade in agricultural commodities. Eur. Rev. Agric. Econ., 5: 361–379.
MacLaren, D., 1982. Agricultural trade and MCA's: a spatial equilibrium analysis. J. Agric. Econ., 32: 1–9.
McFarquhar, A., Godley, W. and Silvey, D., 1977. The cost of food and Britain's membership of the EEC. In: Cambridge Economic Policy Review. Gower, Cambridge.
Parsons, S., 1981. A graphical approach to MCAs. Oxford Agrar. Stud., 10: 170–185.
Peters, G.H., 1980. The green pound – a simplified expository analysis. J. Agric. Econ., 31: 113–120.
Ritson, C., 1978. A note on the green pound and the balance of payments. J. Agric. Econ., 29: 337–340.
Ritson, C. and Tangermann, S., 1979. The economics and politics of monetary compensatory amounts. Eur. Rev. Agric. Econ., 6: 119–164.
Rollo, J.N.C. and Warwick, K.S., 1979. The CAP and resource flows among EEC member states. Gov. Econ. Serv. Work. Pap. 27, Ministry of Agriculture, Fisheries and Food, London.
Sakellis, M., 1982. Demand functions for meats in Greece: a note. Oxford Agrar. Stud. 11: 122–134.
Schmitz, P.M., 1979. EC price harmonization: a macroeconomic approach. Eur. Rev. Agric. Econ., 6: 165–190.
Strauss, R., 1983. Economic effects of MCA. J. Common Market Stud., 21: 261–281.
Swinbank, A., 1980. A note on the green pound and the national economy. J. Agric. Econ., 31: 253–256.
Tangermann, S., 1979. Germany's role within the CAP: Domestic problems in international perspective. J. Agric. Econ., 30: 241–259.