

# **The Common Agricultural Policy of the European Community**

## **Principles and Consequences**

By Julius Rosenblatt, Thomas Mayer, Kasper Bartholdy,  
Dimitrios Demekas, Sanjeev Gupta, and Leslie Lipschitz



International Monetary Fund  
Washington, D.C.  
November 1988

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**Cataloging-in-Publication Data**

The Common agricultural policy of the European Community : principles and consequences / by Julius Rosenblatt — [et al]. — Washington, D.C. : International Monetary Fund [1988]

(Occasional paper, ISSN 0251-6365; no. 62)

"November 1988."

1. Agriculture and state — European Economic Community countries.  
2. Agriculture — Economic aspects — European Economic Community countries. 3. Produce trade — European Economic Community countries 4. Agriculture — Economic aspects — Germany (West) I. Rosenblatt, Julius II. Series: Occasional paper (International Monetary Fund); no. 62.

HD1920.5.Z8C65 1988

ISBN 1-55775-036-X

Price: US\$7.50

(US\$4.50 university libraries, faculty members, and students)

Address orders to:

External Relations Department, Publication Services  
International Monetary Fund, Washington, D.C. 20431



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The following symbols have been used throughout this paper:

- ... to indicate that data are not available;
- to indicate that the figure is zero or less than half the final digit shown, or that the item does not exist;
- between years or months (e.g., 1984–85 or January–June) to indicate the years or months covered, including the beginning and ending years or months;
- / between years (e.g., 1985/86) to indicate a crop or fiscal (financial) year.

“Billion” means a thousand million.

Minor discrepancies between constituent figures and totals are due to rounding.

## Prefatory Note

This paper had two purposes: first, to trace the evolution and major developments of the Common Agricultural Policy (CAP) of the European Community and, second, to assess its effects on the economies of the EC member countries and on the rest of the world. From an economic point of view, the conclusions of the study are unambiguous: the CAP has been less than fully effective at attaining its goals and its instruments have entailed very costly inefficiencies. But it would be unfair to judge the performance of the CAP only against the norms of free trade—free trade in agriculture proved an elusive objective with considerable intervention by most governments.

The authors are indebted to numerous colleagues and to staff members of the EC Commission for helpful comments on an earlier draft of this paper. The views expressed should not be attributed, however, to anyone other than the authors and should not be construed as those of the Fund. The authors are also grateful to Behrouz Guerami and Ted Saxerud for research assistance, Valerie Pabst for secretarial assistance, and Juanita Roushdy and Elin Knotter of the External Relations Department for editing. A word on the ordering of the names of the authors may be useful: Messrs. Rosenblatt and Mayer coordinated the work; the names of the other authors are in alphabetical order.

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# I Introduction and Conclusions

The adoption of a common agricultural policy (CAP) was incorporated in the Treaty of Rome, which came into force in 1958 and laid the foundation for the European Community (EC). It was listed among the steps that needed to be taken to establish a "common market," without customs duties or quantitative restrictions between member states, and a common commercial policy toward third countries. This provision followed from the particular conditions prevailing in agriculture. In the 1950s, the prospective member states had increased the degree of government intervention in agriculture in order to support farm incomes. The purpose of these policies, which were becoming increasingly comprehensive and complex, was both to prevent prices from being depressed by a rapid rise in output and to enable farm incomes to keep pace with other incomes despite the relatively low income elasticity of demand for agricultural products. Given the desire to bring agriculture within the ambit of the common market and to maintain a degree of government intervention in this sector, there was no alternative but to adopt a common policy so as to avoid the distortions that might result from a continuation of separate national agricultural policies.

The CAP, once heralded as a cornerstone of European economic integration, has come under increasing criticism in recent years. By shielding farmers from market forces at a time of rapidly rising productivity, it has generated growing surpluses and imposed a heavy burden on the European Community in terms of both the overall allocation of resources and the financial costs to the common budget. It has also created tension in international trading relations because of the insulation of agricultural prices in Europe from those on world markets.

A broad awareness exists in the European Community of the problems posed by the CAP, not least in the area of international trade relations. That is why the Community has been engaged, at least since 1984, in a process of reform of the CAP that has gradually been gaining momentum. The objective is to achieve a better adjustment of supply to demand through measures that enable market forces to play a greater role. The confirmation by the European Council of Heads of State or Government in June 1987 of its commitment to such reform—in the context of similar efforts undertaken by the other industrial countries<sup>1</sup>—ushered in a new and, as it turned out, laborious round of negotiations. In

February 1988, the European Council endorsed a major package of measures, which, it is hoped, will make it possible to bring agricultural production and, hence, expenditure on support policies under closer control. The implementation of these measures is expected to be completed shortly. But much still remains to be done.

The problems posed by the CAP, while they have their own characteristics, are by no means unique. It is not just that policies to enable farm incomes to keep pace with other incomes existed in European countries before the inception of the CAP and are common to most industrial countries, but that, in many instances, broadly similar arrangements have been used to extend support (as is illustrated in Table 1). A distinguishing feature of the CAP, however, is its supranational organization. Thus, given the need to balance not only the sometimes different interests of domestic pressure groups but also those of different nations, a solution to the problems of the CAP seems so much harder to achieve.

The structure of this study is as follows. Section II describes the historical background, the key principles, and institutional details of the present system. It shows that agricultural pricing policies aimed at supporting farm incomes were already in place in EC member countries before the inception of the CAP; indeed, in the presence of these policies, the CAP was a logical consequence of the extension of the common market to the agricultural sector. Thus, the flaws of the CAP can be traced back to national policies and attitudes toward agriculture.

The rapidly increasing cost of the CAP to the Community's common budget has attracted much attention over the years, not least because of the increasing involvement of the highest political authorities in settling the disagreements to which it has given rise. More fundamentally, however, the CAP has been controversial because of its impact on the allocation of resources in the economy as a whole. Section III, therefore, deals with the economic effects of the CAP on EC member countries. The effects of "CAP-like" policies are analyzed with the help of a computable general equilibrium model that is numerically specified for the Federal

<sup>1</sup> The Council referred to the international undertakings entered into at the Organization for Economic Cooperation and Development and to the 1987 summit meeting of heads of state or government of the seven major industrial countries in Venice.

**Table 1. Agricultural Producer Support for Selected Countries and Major Commodities, 1982–84**

Commodity	Japan	European Community	United States
Grains	State trading	Price supports maintained by intervention purchases Variable levy Export refunds	Deficiency payments Payments in kind (PIK) entitlements Commodity Credit Corporation (CCC) inventory operations and commodity loans
Oilseeds	Deficiency payments	Deficiency payments	CCC inventory operations and commodity loans
Dairy	Price supports through government stockholding and trade barriers Some deficiency payments	Price supports maintained by intervention purchases Variable import levies Export refunds	Price supports maintained by tariffs, quotas, and government purchases
Livestock	Beef: Quotas Tariff Domestic price stabilization Pork: Variable levy Poultry: Tariff	Price supports maintained by intervention purchases Variable import levies Export refunds	Beef: Tariff Other: General (research and development, inspection, etc.)
Sugar	Price stabilization Import levy	Price supports maintained by intervention purchases Variable import levies Export refunds Production quotas	Price supports Import quotas

Source: United States, Council of Economic Advisors (1987), p. 164.

Republic of Germany. The analysis gives a broad indication of the direction and size of the effects on the German economy of a complete dismantling of the CAP. These calculations show that a dismantling of the CAP would reduce consumer prices in Germany by about 1¾ percent, increase aggregate employment by around 5½ percent, and raise gross domestic product (GDP) by about 3½ percent. These effects are larger than those found in studies that use partial equilibrium techniques but are not significantly different from the results of other general equilibrium analyses. The income gains from a dismantling of the CAP imply that the redistribution of income to farmers through price support is grossly inefficient. According to estimates in the studies surveyed in Section III, the transfer of ECU 1 (European currency unit) from consumers and taxpayers to farmers under the CAP entails additional economic costs of about ECU 0.75.

Also in Section III, the longer-run effects of the CAP are investigated by examining economic developments in EC member states over the last two decades or so and comparing these developments with those in non-EC countries. It is demonstrated that the objectives of maintaining the stability and growth of agricultural incomes in EC member economies by means of price support have resulted in the prices of several key agricultural products being at times considerably above “world market” prices or the prices of low-cost

suppliers. At the same time, reflecting the restructuring of the agricultural sector toward larger farm sizes and the rapid pace of mechanization, labor productivity in this sector has increased more rapidly than total labor productivity. This has led to a significant increase in the self-sufficiency of the EC in most products covered by the CAP. As a result of the rapid increase of production relative to consumption, stockbuilding and the EC’s agricultural exports have risen rapidly while agricultural imports have grown at a rate below that of total imports. Nevertheless, despite the price support given under the CAP, agricultural producer prices have declined relative to industrial prices or general price indices in EC economies, and relative productivity gains have not been large enough to prevent farm incomes from deteriorating in recent years.

The EC as a group is the leading importer and the second largest exporter of agricultural commodities in the world. Hence, the question of the international effects of the CAP is taken up in Section IV. It is shown that the CAP has had a depressing effect on the world market prices of a number of agricultural commodities and that its dismantling would turn the EC into a net importer and the developing countries into net exporters of agricultural products. It is also likely that, notwithstanding losses for certain developing countries in the short run, in the longer run a liberalization of trade in agriculture may well increase real incomes in developing



countries; moreover, a dismantling of the CAP would also contribute to greater price stability in world markets for agricultural products.

Section V discusses the progress to date on the reform of the CAP. It highlights important episodes in the policy debate and places the debate in historical perspective; it recalls that the problem of excess production was an issue even before the formation of the CAP and that many of the budgetary and international implications of the CAP were foreseen. In the review of reform, particular attention is given to the policy package of February 1988. While the importance of this package is underscored, it is pointed out that its efficacy remains to be tested and that, in keeping with policy, it leaves agricultural support at a high level.

As noted, the present problems of the European Community's agricultural sector are deeply rooted in national attitudes and policies. But this should not lead to an underestimation of the CAP's own dynamics. Indeed, while the CAP may not have caused the problems of the agricultural sector, it has aggravated them by making price support (which is implemented with the help of border protection in the form of import levies and export subsidies) more comprehensive and by institutionalizing it at a supranational level. Moreover, the need for unanimity among the member states has entrenched the CAP and rendered reform more difficult. The basic mistake, which is older than the CAP, is the belief that stable and adequate incomes for farmers can be achieved through agricultural price support. As historical experience has vividly demonstrated, this instrument is neither effective

nor efficient. It is not effective because the development of producer prices has not ensured an adequate level of income for small-scale farmers—which is one of the principal objectives of the CAP—but has generated windfall gains for more efficient large-scale farmers. It is not efficient because aiming at stable and adequate incomes for all farmers has led to output and welfare losses for the economy as a whole.

For these reasons, a move away from the support of agricultural prices toward more market-oriented solutions would appear highly desirable. In particular, the history of price fixing under the CAP demonstrates that if agricultural support prices exist, the pressures to fix them (well) above market clearing levels are irresistible. Clearly, a move away from price support would need to be compensated by direct income payments toward lower-income farmers, at least over an adjustment period, and, if considered desirable on social and regional grounds, over the longer term.

Recognition of the burden of agricultural support on the rest of the economy, as well as the growing budgetary costs, has elicited a greater public interest in the CAP. Equally, the trade frictions caused by export subsidies have underlined the CAP's international implications. For these reasons, the member states appear more determined than hitherto to bring agricultural expenditure under control. The policy package endorsed last February by the European Council is, if successfully implemented, an important step in that direction. Given the wider effects of the CAP both on EC economies and the international community, it is to be hoped that current efforts at reform will be successful.

## II The Operation of the CAP

This section addresses two main questions: (1) How has agricultural policy in EC countries developed over time; and (2) how does the Common Agricultural Policy work?

### The Evolution of the Agricultural Sector

The agricultural production of the Community consists almost exclusively of temperate zone products: livestock products—meat, eggs, and dairy products—account for about half of production and crop products for the other half. The balance between the two broad categories of products varies among member countries: in northern countries livestock farming contributes roughly 60 percent to output, in southern countries about 40 percent, and in France, which straddles the two geographical areas, there is rough balance. Like other major industrial areas, the Community has experienced a sharp decline in the relative importance of agricultural activity; this has happened in all member states, although the pace of adjustment has differed among them. At the same time, however, labor productivity in agriculture has risen rapidly, at high rates in the 1960s and early 1970s and at somewhat lower, but still significant, rates since then. These productivity gains have resulted in a growth of production much larger than the growth of demand and have contributed to rising degrees of self-sufficiency in many important agricultural products.

Over this period there have been profound changes in the structure of agriculture. With an exodus from the land, there has been not only an increase in the average size of holdings, but also in the relative importance of large farms. This development, however, has differed significantly among countries, and the average size of holdings has continued to vary considerably. Holdings have remained largest in the United Kingdom and smallest in Italy and Greece. The divergence in average farm sizes in the Community has further complicated pricing policies under the CAP. While prices have maintained the profitability of the larger and more efficient farms, which account for the bulk of output, for many small farms recent pricing policies have been associated with a stagnation or reversal of the income gains in the early period of the CAP.

### Origins and Principles of the CAP

The objectives and the main features of the CAP were stated in Articles 39 and 40 of the Treaty of Rome. Five objectives were adopted: raising productivity, ensuring a fair standard of living for the agricultural community, stabilizing markets, food security, and reasonable prices for consumers.<sup>2</sup> Depending on the product concerned, the CAP would entail common rules on competition, compulsory coordination of the various national market organizations, or a European market organization.<sup>3</sup> The measures to which the common organization thus established might resort would be, in particular, regulation of prices, aids for the production and marketing of the various products, storage and carryover arrangements, and common arrangements for exports and imports to underpin the price regime.

This set of measures, which continues to characterize the CAP, was in accordance with the policies pursued earlier by the Community's founding member states. Then, as now, the authorities wanted to support farm incomes by means of indirect support measures to stabilize producer prices, while at the same time improving productivity through structural policies. The common element of the arrangements for price support was the (gradually increasing) reliance on minimum prices. This was enforced chiefly through intervention in the market by specialized entities, either public bodies or bodies set up by professional organizations. In the course of the 1950s, as the rapid growth of output made it increasingly difficult for markets to clear at prices considered equitable by the authorities, the number of products covered was extended and the "organization of the market" was made more comprehensive. In some countries, the latter included the payment of export subsidies. The policies for structural improvement also varied a great deal among countries, but the common characteristics were public investment in infra-

<sup>2</sup> The present paper does not discuss the rationale for these objectives, assuming that supporting farmers in the EC or elsewhere is a matter of social choice.

<sup>3</sup> Market organization is the collective name of the rules and regulations adopted by the authorities to influence the supply of and demand for a particular commodity.

structure, including transportation and education, and subsidized credits for investment.<sup>4</sup>

These policies of direct intervention were motivated by how agriculture developed in the first ten years or so after the end of World War II. The recovery of output after 1945 was remarkable. In 1957/58, agricultural output was 28 percent above its prewar level, despite a 20 percent reduction in the work force and a slight reduction in the acreage under cultivation. The gains in productivity were brought about not just by a sharp increase in the use of chemical fertilizers but also by significant modernization through investment, as exemplified by the surge in the number of tractors and the accompanying decline in the number of draught animals. By 1959, the total population of the original six member states of the EC<sup>5</sup> was some 20 percent higher than the prewar level; nevertheless, per capita agricultural output was higher than in the last few years before World War II.

The level of supply achieved for individual commodities deserves attention. In particular, it may be noted that in the second half of the 1950s, supply in the EC-6 of such important commodities as potatoes, sugar, vegetables, pork, and dairy products was already as high as demand, or even slightly exceeded it (Table 2). The message conveyed by these data is twofold. First, they strongly suggest that the CAP's contribution to food security in the Community has been less important than is often claimed. Second, they show the extent to which clearing the markets for certain products already posed a problem at the time when the foundations for the CAP were being laid.

Agricultural surpluses were somewhat of an international issue in the late 1950s. The very rapid expansion of production after World War II had been given additional impetus during the so-called Korea boom. When the boom subsided, prices generally began to decline significantly and the view gained ground that production had overshot its equilibrium level and policies needed to be adjusted in order to eliminate surpluses. In the Organization for European Economic Cooperation (OEEC)<sup>6</sup> and the Food and Agriculture Organization of the United Nations (FAO) there were discussions on the policy changes that might be needed, especially in cases involving dumping. At the conference held to prepare the ground for the CAP, which took place in Stresa, Italy, in 1958, the Community's member states were divided as to the appropriate policy response. Some contended in substance that surpluses could not be an issue because of the equilibrating role of market forces; others argued that there was an issue because some countries did not give such forces sufficient scope and resorted to subsidies, notably for

**Table 2. EC: Self-Sufficiency in the Community of Six Before the CAP**

(Domestic production in percent of demand)

	Period Before World War II <sup>1</sup>	Average 1954/55–1958/59
Cereals <sup>1</sup>	81	85
Potatoes	98	102
Sugar	75	101
Fresh vegetables	102	103
Fresh fruit	89	87
Beef and veal	96	94
Pork	96	102
Eggs	101	91
Cheese	105	100
Butter	104	100
Oils and fats	41	40
Total	85	87 <sup>2</sup>

Source: Communauté Economique Européenne, Commission (1960), Part I, p. 9.

<sup>1</sup> Time period not specified in source.

<sup>2</sup> Average 1953/54–1957/58.

exports, to keep surpluses under control.<sup>7</sup> A common position was reached, nonetheless. Among the points on which there was general agreement, the Final Resolution mentioned that "A balance must be sought between production and potential outlets in the light of export and import possibilities and of a specialization adapted to the natural conditions within the Community and to its economic structure." And it was said that such a policy "should render possible the application of a price policy which will avoid overproduction while enabling goods to remain or to become competitive."<sup>8</sup>

The general policies governing the CAP were further elaborated upon in the detailed operational proposals submitted by the Commission in June 1960. One particular interesting point made in this context concerned the relationship between the Community's common price level and world market prices. It was explained that, in the interest of producers and consumers, the Community's markets needed to be shielded from excessive price fluctuations on world markets. Two reasons were given. First, conditions in the Community differed greatly from those in the large exporting countries outside Europe. Second, world market prices were often distorted by government intervention. That was why agricultural prices in the Community could generally not be the same as those registered on world markets but should be stabilized at a slightly higher level.<sup>9</sup> This was recognized to amount to a contradiction in the area of trade policy inasmuch as measures to restrict the influence of international competition conflicted with the overall aim of

<sup>4</sup> For some detail on the policies pursued by individual countries prior to the adoption of the CAP, see Services des Publications des Communautés Européennes (1958). (Hereinafter referred to as Stresa papers.)

<sup>5</sup> Belgium, France, the Federal Republic of Germany, Italy, Luxembourg, and the Netherlands, hereinafter referred to as EC-6.

<sup>6</sup> The OEEC was superseded by the OECD on September 30, 1961.

<sup>7</sup> Stresa papers, p. 182 and pp. 189–92.

<sup>8</sup> Stresa papers, p. 222. English version was taken from excerpts quoted in Commission of the European Communities (1987a), p. 17.

<sup>9</sup> Communauté Economique Européenne, Commission (1960), Part II, p. 21.

expanding the Community's external trade, including that in agricultural products. The conclusion was drawn that this would require the Community to be flexible in the pursuit of its aims.<sup>10</sup>

## The Institutional Setting

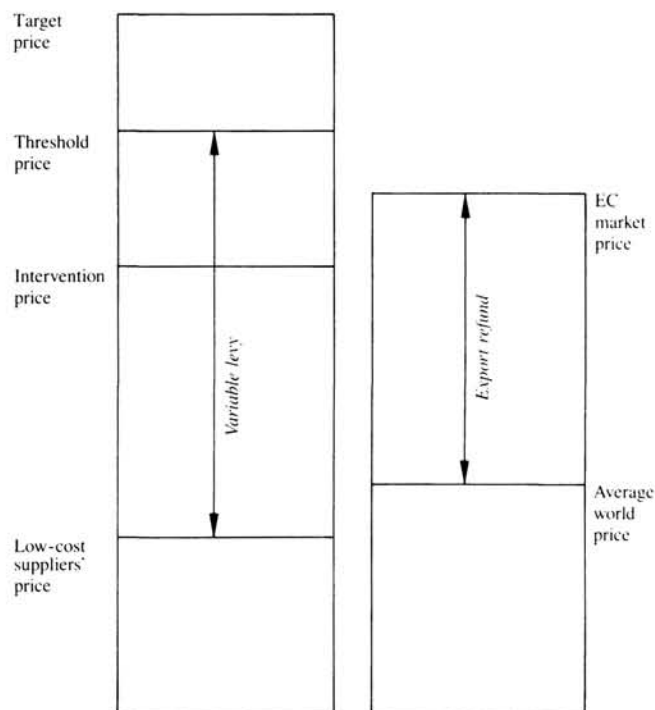
The objectives of the CAP are served by many different instruments. While a summary presentation (Table 3) cannot do justice to their complexity and variety, which is essentially due to differences among the products concerned, the instruments can be divided into price support and nonprice support.<sup>11</sup>

For most of the products covered by the CAP (about 91 percent of output in 1986), an elaborate system of price support is in place (Chart 1).

In most cases, it rests on three prices which are, in descending order: the target price,<sup>12</sup> which is the upper end of the range within which producer prices are left to fluctuate; the threshold price,<sup>13</sup> which is the lowest price at which imports may be made; and the intervention price, at which public bodies buy in to support the market. Although the scope of intervention purchases has been reduced somewhat in recent years, the intervention price remains by and large a minimum price guaranteed to producers. For some products, however, there are co-responsibility levies, designed so that producers themselves finance part or all of the disposal of excess supplies and also to serve as disincentives to production. Moreover, the entitlement to CAP benefits may be limited to a specified volume of output (production quotas) or be reduced somewhat, with a time lag, when a specified volume of output has been exceeded (guarantee thresholds).

Imports are subject to levies that are broadly calculated as the difference between the relevant threshold prices and the corresponding prices abroad, quoted in the world markets or in selected supplier countries. Because prices within the

**Chart 1. Basic Mechanism of CAP Price Support**



Community are usually below their targets, import levies tend to make imports more expensive than domestic products. There are, however, preferential import quotas for a few products and voluntary export restraints for mutton.

Variable subsidies, known as "refunds," are used to help exporters to overcome the handicap of lower world market prices. The system of variable levies and subsidies—referred to as "Community Preference"—can also serve to shield the Community against world market prices that are higher than those at home, and it has been used to this effect in some rather brief episodes of relatively high external prices.<sup>14</sup>

One of the principles of the CAP is that institutional prices, expressed in ECUs, should be uniform throughout the Community in order to avoid trade distortions. With more frequent exchange rate changes, however, adherence to the principle of one price became increasingly difficult. If a common price level is to be maintained in the face of exchange rate changes within the Community, administered prices will have to be adjusted in inverse proportion to the exchange rate changes against the ECU, which is the unit of account in agricultural pricing. Specifically, a country with an appreciating currency will have to reduce its prices; a

<sup>10</sup> *Ibid.*, p. 26.

<sup>11</sup> The most commonly used nonprice support instruments are storage subsidies, which are chiefly meant to soften the impact on the market of seasonal fluctuations in production; consumer subsidies; input subsidies; and deficiency payments and production premiums of various kinds. These instruments are used in a highly selective fashion. Nonprice support also includes structural measures financed by the Community, such as irrigation schemes, reforestation projects, and research and development. These structural measures may well be important for the future development of the Community's agricultural sector; at present, however, they account for only a small fraction of total expenditure on the CAP. For details of the arrangements in force for individual commodities covered by the CAP, see Commission of the European Communities (1985b).

<sup>12</sup> The term "target price" is used for cereals, sugar, milk, olive oil, and grape and sunflower seeds. To reflect technical differences, "guide price" is used for bovine meat and wine, "norm price" for tobacco, and "basic price" for pork.

<sup>13</sup> The term "threshold price" is used for cereals, sugar, dairy products, and olive oil. Essentially the same concept is referred to as "sluice-gate price" in the case of pork, eggs, and poultry meat, and "reference price" in the case of fruit, vegetables, wine, and certain fishery products.

<sup>14</sup> The mechanisms adopted for the products covered by the CAP do not give agriculture full protection against foreign competition. For example, to secure the acceptance of the CAP by its trading partners, the Community agreed that oilseeds and so-called cereal substitutes enter the EC without import duties or quantitative restrictions. The Community believes that the large and growing imports of cereal substitutes as feedstuffs are partly responsible for the excess supply of dairy products.



**Table 3. The Main Instruments Used for the Implementation of the CAP—Selected Products**

	Cereals <sup>1</sup>	Sugar	Dairy <sup>2</sup>	Beef/ Veal	Sheep- meat	Fresh Fruit and Vegetables <sup>2</sup>	Processed Fruit	Wine <sup>3</sup>
Intervention	x	x	x	x	x	x <sup>4</sup>	x <sup>5</sup>	x
Storage aid			x	x	x			x
Direct aid	x <sup>6</sup>		x	x	x	x <sup>7</sup>	x <sup>8</sup>	
Import levies and export refunds	x	x	x	x	x <sup>9</sup>	x	x <sup>10</sup>	x <sup>11</sup>
Co-responsibility levies	x	x	x					
Guarantee threshold	x						x <sup>12</sup>	
Production quotas		x	x					

Source: The information presented in this table was taken mainly from Commission of the European Communities (1985b).

<sup>1</sup> Except rice.

<sup>2</sup> Arrangements generally applicable only in periods of large-scale marketing.

<sup>3</sup> Only table wines are subject to the prices and intervention systems.

<sup>4</sup> Intervention only in a "crisis situation." Otherwise, "withdrawal" of surpluses at a low price.

<sup>5</sup> No levies on imports.

<sup>6</sup> For durum wheat produced in certain regions of Italy, Greece, and France.

<sup>7</sup> For citrus fruit.

<sup>8</sup> Aid for processing of selected products, in some cases with a quantitative ceiling. The products concerned are various tomato derivatives, dried figs, raisins, a particular type of prune, and preserves in syrup (cherries, peaches, and Williams pears).

<sup>9</sup> In case of voluntary export restraints, levies may not exceed amounts laid down in the agreements.

<sup>10</sup> For a limited number of products.

<sup>11</sup> Provided the import price is not lower than the relevant reference price, there are no levies on imports.

<sup>12</sup> For aid for the processing of tomatoes.

country with a depreciating currency will have to raise prices. As shown by events, most member states have been unwilling to abide strictly by this rule. After an adjustment period, a common price level was achieved in mid-1967 but was upset in 1969 following parity changes by two member states. After having been restored briefly, it was again disrupted and its re-establishment has proved contentious and elusive ever since.

The resistance to an instantaneous adjustment of agricultural prices following exchange rate changes is related to inflation and income distribution. When imported and domestically produced products are poor substitutes, as may be the case in manufacturing, a modification of the exchange rate makes its way progressively through the economy and has an immediate impact only on imported inputs. When imported and domestically produced products are close substitutes, as in agriculture, however, the adjustment is much faster and affects the entire price of the product, not just the imported inputs. The Community-wide institutional prices in force under the CAP further increase the effect of a devaluation on inflation. To mitigate this effect, in 1969 France initiated the policy of phasing in the price increase, which implied of course that price unity was no longer being maintained. Countries with strong currencies are concerned about the immediate, and politically highly visible, income loss inflicted upon farmers by a revaluation. As long as there are annual Community-wide price increases, the adjustment can be made less painful by letting farmers forgo price increases instead of reducing support prices. For this reason, that is, to obtain the time needed for the common ECU price

level to rise by a margin considered adequate, the Federal Republic of Germany became the second country, a few months after France, that insisted on delaying agricultural price adjustments after an exchange rate change.

In the absence of offsetting measures, breaches of price unity would unavoidably lead to major trade distortions. These would be all the greater because farmers in countries with devalued currencies would be in a position to sell unlimited quantities to intervention agencies of countries with revalued currencies. To avoid this, trade was made subject to monetary compensatory amounts (MCAs). They serve as import levies and export subsidies for countries with revalued currencies, where domestic prices exceed the common price level, and they serve as import subsidies and export levies for countries with devalued currencies, where domestic prices are below the common price level. MCAs are called positive in the first case and negative in the second.<sup>15</sup>

Experience suggests that there is a trade-off between the rate of increase in the common price level decided at the annual review and the accompanying decisions on the dismantling of MCAs. From 1983 onward, the annual price increases became smaller because of both the slowing of inflation and the wish to contain the growth of output. This led to significant resistance to the dismantling of positive MCAs. (The countries with positive MCAs were the Federal Republic of Germany, where they peaked in April–May

<sup>15</sup> The computation of MCAs at different stages and the changes undergone by the system are explained in Appendix II with the help of some simplified examples.

1983 when they had to offset a monetary gap of 13 percent, the Netherlands, and, for a time, the United Kingdom.) To facilitate the return to price unity, it was decided in March 1984—initially for a period of three years—to change over to a system of negative MCAs only so that realignments would only give rise to price increases. This was done by moving the reference point for the calculations from the ECU to the strongest currency in the system, that is, in practice, the deutsche mark. The system was not only adopted for the MCAs to be created on the occasion of future currency realignments, but it was also decided to convert most of the positive MCAs into negative ones.<sup>16</sup> The consequence of moving from the ECU to the strongest European Monetary System (EMS) currency—referred to officially as the switch over to the Green ECU—was of course to give the common price level an upward tilt.

The main problem posed by the MCA system is the distorting impact it may have on the competitiveness of each member state's agricultural sector. As shown by the levels sometimes reached by MCAs, this is far from a negligible issue (the level of MCAs is indicated by the size of the applied monetary gaps which they are designed to offset; see Table 4 in Appendix I). If a devaluation within the EMS enables a country to raise agricultural prices by more than the prices paid by farmers for their inputs, this will increase the competitiveness of that country's agricultural sector by making farming more profitable. If, on the other hand, a country does not raise support prices commensurately with the devaluation, the competitiveness of the agricultural sector may be reduced, in particular because of the higher cost (in domestic currency) of imported inputs. In the case of a country with a strong currency, if support prices are not lowered commensurately with a revaluation, the profitability of farming increases because imported inputs have become cheaper in relation to output prices in terms of the national currency. It is therefore not surprising that decisions about MCAs should be on the agenda of the Community's Ministers of Finance at the time of EMS realignments.<sup>17</sup>

It stands to reason that the price differences among the member states that are reflected in the MCAs should have an impact on supply and demand, and on trade within the Community and with third countries. Nonetheless, the Commission in two studies was unable to detect clear trends bearing this out. The first study covered the period 1969–76; the second extended the analysis to 1984.<sup>18</sup> The Commission's broad conclusion was that the performance of the member states could not be ranked in the light of changes in

MCAs, be it for their total production or individual products, because of the much more powerful combined impact of the other factors determining farmers' decisions.

## Public Expenditure on Agriculture

Public expenditure on agriculture in the Community is undertaken by the European Agricultural Guidance and Guarantee Fund (EAGGF), which is the financial arm of the CAP, and by national authorities. In the years when the CAP was being put into place, the EAGGF gradually assumed the financial responsibilities for the policies pursued under the CAP. After the completion of this period of transition, and at least since January 1970, the EAGGF and the national authorities have had distinct areas of financial responsibility. New member states, however, go through transitional periods of their own in the course of which the gradual implementation of the CAP is accompanied by an increase in the role played by the EAGGF.

The EAGGF is, in effect, the collective name used for most of the appropriations for agriculture in the Community's common budget.<sup>19</sup> The CAP also generates budget revenue, notably through levies on imports; but this is not set against agricultural expenditure and is considered part of the Community's budget revenue ("own resources"). As an exception, co-responsibility levies imposed on producers are considered part and parcel of intervention and enter as negative items in the calculation of the relevant expenditure.<sup>20</sup> The EAGGF is divided into two "sections": Guarantee and Guidance. Guarantee, which accounts for more than 90 percent of spending, includes the expenditure incurred by the market organizations in the member states for price stabilization, which comprises the refunds on exports to nonmember countries and the cost of intervention.<sup>21</sup> The Guidance section finances measures of a structural nature, be they schemes available to individual farmers or general programs, notably those undertaken to modernize agriculture in a regional context. There is a major financial difference between the two sections: Guarantee expenditure is determined by the interaction of market developments and the policies in force under the CAP; it is therefore not entirely bound by the appropriations entered in the common budget. Guidance expenditure, in contrast, is firmly under the control of the budget authorities. The question of the total costs of the CAP, both financial and economic, and its distribution among members are taken up in the next section.

<sup>19</sup> For a detailed presentation of the EAGGF, see Commission of the European Communities (1986b).

<sup>20</sup> There has been a co-responsibility levy for milk since 1977, with a supplementary one to penalize those who exceed the production quotas introduced in 1984. A co-responsibility levy was introduced for cereals in 1986. The revenue raised by the co-responsibility levy for milk amounted to some ECU 0.7 billion in 1986, about 3 percent of total expenditures of the EAGGF.

<sup>21</sup> Costs of intervention arise when the expenditures for intervention purchases and stockpiling are larger than the revenue from sales out of stocks.

<sup>16</sup> This still left the Federal Republic of Germany with positive MCAs, which it found impossible to dismantle because, as prices were kept roughly stable in terms of ECUs at the subsequent annual reviews, this would have called for price reductions in deutsche mark.

<sup>17</sup> Of course, MCAs for those countries that do not participate in the Exchange Rate Mechanism of the EMS, and for Italy, which has temporarily opted for larger fluctuation margins, have to be adjusted continuously.

<sup>18</sup> Commission of the European Communities (1978) and (1984).

# III The Effects of the CAP on EC Member Countries

It has been argued that the CAP has maintained agricultural prices in EC countries above world market prices; that it has encouraged production of certain products to the extent that net importers of these products have become net exporters; that it has failed to maintain the income of small farms while at the same time giving rise to large windfall profits for large farms; and, finally, that it has contributed to larger agricultural net exports (and stockbuilding) by the EC than would have occurred in its absence. All this, it is asserted, has had negative effects on the economic welfare of EC member countries.<sup>22</sup>

An empirical test of these hypotheses and the quantification of the effects of the CAP are, however, fraught with difficulties. Ideally, one would like to establish some counterfactual standard against which to measure actual developments. By comparing actual developments with some counterfactual set of circumstances (a "free market" for example), the effects of the CAP on the member countries' economies could be isolated. A few attempts at this have been made;<sup>23</sup> but, in view of the complexity of the undertaking, it is not surprising that they have been less than fully satisfactory.

The effects of economic policies are sometimes also studied by comparing developments in economic variables before and after the implementation of the relevant measures or by comparing developments between economies affected and those not affected ("control group") by these measures. In addition to more general objections that can be raised against these techniques,<sup>24</sup> there are two particular difficulties that may distort the analysis. First, before the inception of the CAP, the EC countries already had national policies in place designed to support the agricultural sector. A comparison of economic developments before and after the inception of CAP, therefore, tends to pick up the effects of

the implied changes in agricultural policies (if any) rather than the net economic costs or benefits of the CAP, which can only be evaluated against a "free market" counterfactual case. Second, other major agricultural producers also give support to their agricultural sectors; a comparison of developments in the CAP with those in a "control group" would therefore highlight the effects of different policies between country groups rather than the full influence of the CAP.

In light of these unresolved analytical difficulties, a rather pragmatic approach is taken here in assessing the effects of the CAP on its members. In the first part of this section, the effects of "CAP-like" policies are traced with the help of a computable general equilibrium model that is numerically specified for the Federal Republic of Germany. The main questions investigated are (1) how do policy measures under the CAP affect output, employment, and trade flows in agriculture and other sectors of the economy; and (2) what is the net effect of these measures on economic welfare? Results of the model simulations give a broad indication of the direction and size of the effects of agricultural support policies on the national economy. The discussion is then continued in the last part of the section with an analysis of the evidence on longer-run trends (which, of course, are of a "non *ceteris paribus*" nature) in the light of the model simulations. Thus, while the simulation and historical analysis may appear unsatisfactory when used in isolation, some inferences on the effects of the CAP on EC economies can probably be obtained by the combination of the two approaches. The section concludes with a presentation of the results of various studies on the financial and economic costs of the CAP.

## The Case of the Federal Republic of Germany

An important objective of the CAP is to ensure stable and adequate incomes for farmers. The principal instrument for achieving this objective is agricultural producer price support. The pursuit of this policy, it is asserted, has led to agricultural producer prices in the EC that have at times been significantly above world market prices.

Domestic agricultural prices that are kept above world market prices by a combination of tariffs, quantitative re-

<sup>22</sup> Unless otherwise indicated, the analysis for the EC focuses on the Community of 10, i.e., Portugal and Spain, which joined recently, are excluded.

<sup>23</sup> See Appendix III for a survey of existing studies.

<sup>24</sup> A major shortcoming of the first technique is the assumption that in the period of investigation no factors other than the introduction of the CAP influenced economic developments. The second technique rests on the equally unrealistic assumption that differences between CAP member countries and the control group result only from differences in agricultural policies.



strictions, variable levies, and subsidies have direct effects on consumers and producers, as well as on government budgets. These effects are usually explained in terms of a simple (partial equilibrium) demand and supply framework. For a small importing country, that is, a country which cannot influence the world market price of the products it imports, domestic prices higher than world market prices usually imply a loss to consumers (measured in terms of consumer surplus) that exceeds the sum of the gains of producers and the government (in the form of tariff revenue). Thus, there is a net welfare loss to the country (the so-called deadweight loss). Alternatively, for a small exporting country, the sum of the consumer loss and the government export subsidy payment usually exceeds the gains for producers; this, too, implies a net welfare loss to the country.<sup>25</sup>

But indirect effects of agricultural price support also exist. In particular, more factors and inputs will be absorbed by the agricultural sector than would otherwise be the case. Production and exports (and/or stockbuilding) of agricultural products rise while imports fall. Factor and input prices increase, reflecting higher demand from the agricultural sector, and raise costs for other sectors of the economy. Consequently, industries producing other tradable goods could lose sales to foreign competitors in both domestic and foreign markets, and producers of nontraded goods, such as certain service industries, could pass on their higher costs to the consumer. This, and the higher prices for agricultural products, could raise the general level of costs and prices, thereby exacerbating the loss of external competitiveness. Overall economic efficiency, and economic welfare, could suffer too as marginal products between agricultural and nonagricultural sectors differ. Thus, it is quite likely that agricultural pricing policy is not an efficient instrument for the transfer of income to farmers. Moreover, it is also possible that the effects of the CAP may impinge unfavorably on the attainability of general policy objectives—such as price stability, full employment, or growth—in EC member countries.

These hypotheses are analyzed with the help of a simple, numerically specified, computable general equilibrium model.<sup>26</sup> Since a detailed modeling of all EC economies and their interaction with the rest of the world is beyond the scope of this study, the following analysis focuses on one country but assumes that agricultural price changes are

simultaneously implemented in all EC member countries. Given its economic weight within the EC and its importance for the rest of the world, the Federal Republic of Germany was chosen. The design of the model used here is orthodox and firmly based on conventional microeconomic theory.<sup>27</sup> It emphasizes the role of relative prices and substitution possibilities in explaining trade flows and the commodity composition of domestic activity. The essential postulates governing producer and consumer behavior are profit and utility maximization. The model distinguishes four productive sectors (agriculture, industry, traded services, and non-traded services), four types of final demand (investment, government consumption, private consumption, and exports) from either domestic sources or imports, and three types of primary inputs (labor, capital, and land). It is numerically specified using a 1980 input-output table for the Federal Republic of Germany and parameter estimates culled from the literature. The simulation traces the effects of a liberalization of the CAP under several assumptions about the external and domestic economic environment.

A recent OECD study (OECD, 1988) estimated the level of total protection afforded agriculture in the EC in 1979–81 at 37 percent of value added. About 70 percent of this was accounted for by agricultural price support under the CAP.<sup>28</sup> Thus, in the simulation exercise, abolition of the CAP is assumed to lower the level of protection afforded German farmers by around 26 percentage points. Moreover, liberalization of EC agriculture is expected to raise the world market price for agricultural products. In line with estimates of this effect from the literature (see Section IV), it is assumed that agricultural prices on world markets increase by about 8 percent relative to the price of manufactures.

The simulation also requires a number of assumptions with respect to the structure of the German economy. Specifically, it is assumed that (i) fixed capital stocks in industries are immobile internationally and between domestic industries; (ii) real wages are fixed with employment adjusting endogenously;<sup>29</sup> (iii) the external position (and the private savings-investment balance) is not affected by agricultural trade liberalization; (iv) the nominal exchange rate remains unchanged; and (v) producer and consumer prices

<sup>25</sup> See Appendix III for a more detailed discussion of the measurement of economic welfare effects of the CAP, and the limitations of the partial equilibrium analysis.

<sup>26</sup> Several attempts have been made in the literature to estimate the effects of the CAP on economic welfare in EC countries (see Appendix III for a survey of recent studies). The models used in these studies can be characterized as either partial or general equilibrium models. While partial equilibrium models focus on demand and supply conditions in one or more sectors of the economy and assume that other sectors are not affected by changes in agricultural policy, general equilibrium models explicitly take account of sectoral interdependencies in production.

<sup>27</sup> The model is in the tradition of so-called Johansen models and follows closely the version developed by Dixon and others (1982). A full description of the model and discussion of the simulation results are given in Appendix IV.

<sup>28</sup> The OECD estimated the protection afforded EC farmers by means of producer subsidy equivalents, defined as  $PSE = Q^*(P_d - P_w) + D - L + B$ , where  $Q$  denotes output volumes,  $P$  prices,  $D$  direct income transfers to agriculture,  $L$  fees and levies paid by agriculture,  $B$  other budgetary support, and the subscripts  $d$  and  $w$ , the domestic and world market. The first term on the right-hand side of the equation measures the amount of protection given through price support.

<sup>29</sup> Real wages are generally regarded as rigid in the short run in European countries but relatively flexible in the United States and Japan. For empirical evidence for selected European countries see Klau and Mittelstädt (1986).



move in line—in other words, retail and processing margins are constant.<sup>30</sup>

The simulation indicates a rather strong response of the German economy to the abolition of agricultural price support in Europe. In agriculture, output drops by 5¾ percent, employment by 11½ percent, and exports by 86½ percent from the levels they would otherwise have attained.<sup>31</sup> The losses in agriculture are, however, more than offset by gains in other economic sectors. Lower agricultural prices reduce nominal wages (via lower consumer prices) by a little more than 1½ percent. Owing to lower labor costs and cheaper agricultural inputs, the competitiveness of industry and the traded services sector improves; output and employment in these sectors therefore increase significantly. Domestic demand for manufactures increases by less than output so that exports of manufactures rise by about 12 percent. Domestic demand for traded services, however, increases by more than output so that exports drop by 10 percent. Reflecting higher aggregate domestic demand and lower production costs, output and employment in the nontraded services sector increase by 3½ percent and 5½ percent, respectively.

The net macroeconomic effects of these sectoral developments are significantly positive. The consumer price level declines by about 1¾ percent owing to lower agricultural prices. Aggregate employment increases by 5½ percent as the other sectors provide more jobs than are lost in agriculture. Real income and domestic demand, therefore, increase by about 3½ percent.<sup>32</sup>

These results are, of course, only indicative of the effects of the CAP. They are full equilibrium results abstracting from delays and from adjustment costs. It should also be noted that the results depend on numerous model assumptions and are influenced by the specific parameter values chosen from German economic data. Nevertheless, they appear to give a useful guide to interpreting the historical data that are discussed in the following section.

## Other Evidence

Two groups of questions are addressed in the first part of this section. First, how has the CAP affected the agricultural sector itself? To shed some light on this question, EC prices of certain agricultural products are compared with world market prices, and recent calculations of implicit subsidy rates in the EC and elsewhere are presented. Cost-price

developments, the self-sufficiency of the EC in key agricultural products, and changes in average farm sizes are also discussed. Second, how has the CAP affected resource allocation between the agricultural sector and other sectors of the economies of EC members? A tentative answer to this question can perhaps be obtained by looking at the development of the value added in the agricultural sector relative to GNP, the ratio of agricultural employment to total employment, trade in agricultural products in relation to total trade, and real incomes in the agricultural sector in EC member and other economies.

The second part of this section, which deals with the financial costs and economic welfare effects of the CAP, presents the results of several studies on this subject.

## Price Developments

The objective of maintaining the stability and growth of agricultural incomes in EC member economies by means of price support has resulted in the prices of several key agricultural products being at times significantly above “world market” prices or the prices of low-cost suppliers. In Table 5 in Appendix I, the ratios of domestic (EC) prices to world market prices in common currencies (sometimes referred to as coefficients of nominal protection) are calculated for several key agricultural products.<sup>33</sup> These coefficients give a broad picture of the degree of protection afforded the domestic producers. For most of the selected commodities domestic prices were on average substantially above world market prices during the 1970–85 period, far more than can possibly be explained by dealers’ margins or transportation costs. The estimated coefficients also indicate that the degree of protection has varied significantly over time. This reflects exchange rate movements and varying demand and supply conditions on the international markets for these commodities, which produced divergent movements of domestic and international prices in common currencies. Generally, since EC prices are kept relatively stable, the coefficients of protection tend to be high in periods of low world market prices or a weak U.S. dollar.

It is interesting to note that coefficients of protection have also varied across EC member countries (as indicated by the standard deviations of the coefficients of protection under

<sup>30</sup> This is, of course, a simplification and may lead to an overstatement of the effects of changes in support prices.

<sup>31</sup> Note that exports emerge in the model as the difference between domestic output and consumption. The analysis does not take into account stockbuilding as an alternative to exporting.

<sup>32</sup> The thrust of these results is supported by recent studies by Stoeckel and Breckling (1988) for the Federal Republic of Germany, France, Italy, and the United Kingdom, and by Dicke and others (1988) for the Federal Republic of Germany.

<sup>33</sup> Coefficients were calculated for each product and EC member country using producer prices in ECUs (excluding value-added tax) as published in *Eurostat*, and international commodity prices, as published in *International Financial Statistics*, converted into ECUs. The following prices were taken to represent the world market (i.e., the low-cost suppliers’) prices: for beef, prices quoted in the London market; for sugar, the average of the New York spot price and London daily price, f.o.b. Caribbean ports; for butter, London prices; for maize, the Thailand price; and for wheat, the Australian price. Prices were not adjusted for transportation costs nor for quality differences that may exist between products of different origin. The resulting coefficients of protection give therefore only a broad picture of the actual protection afforded EC producers. Coefficients for the EC as a whole are arithmetic averages of country coefficients.

each year in Table 5). These variations reflect the fact that national, and sometimes also regional, markets have retained their own characteristics, with differences in the selection and quality of products. In part, they may be attributed also to the monetary compensatory amounts (see Section II), and the transportation costs of products imported from afar.

A recent OECD study confirms the impression of a significant degree of protection in European agriculture.<sup>34</sup> Table 6 reproduces OECD estimates of "producer subsidy equivalents," defined as the payments—as a percent of value added—needed to compensate producers for the removal of agricultural producer support policies, for the periods 1979–81 and 1984–86.<sup>35</sup> Livestock products tend to be more heavily protected than crops, but protection of the latter has increased raising the average rate of producer subsidy equivalents in the EC from 37 percent in 1979–81 to 40 percent in 1984–86. The international comparison suggests that agricultural production is less protected in the EC than in Japan but more protected than in the United States, Canada, Australia, and New Zealand.<sup>36</sup>

Despite the price support given under the CAP, agricultural producer prices have declined relative to industrial prices or all prices in the EC economies over the 1975–86 period (Table 7). The relative decline was most pronounced in the United Kingdom while in Belgium relative agricultural prices were in fact slightly higher in 1986 than in 1975. Also, farmers have been under substantial cost pressures in all EC countries as input prices have increased much more strongly than producer prices (Table 8), but this has been alleviated by productivity increases (see below).

### Production and Consumption Balances

Rapid increases in self-sufficiency rates<sup>37</sup> in the EC for most products covered by the CAP (Tables 9–18) are, of course, consistent with the results of the model in the previous section. In the case of cereals, the EC changed from being a net importer before the inception of the CAP to being a net exporter in more recent years (Table 9). With the exception of the Netherlands, degrees of self-sufficiency increased in all countries during the 1965–85 period. A few of the member countries with a relatively more efficient agricultural sector experienced substantial increases in production. Prior to joining the EC and adopting the Common Agricultural Policy in 1973, the United Kingdom was a net importer of cereals; only ten years later it became a net

exporter.<sup>38</sup> A similar change occurred in Denmark and Ireland, which joined at the same time, and in Greece, which joined in 1981. The degree of self-sufficiency also almost doubled in France after the adoption of the CAP. Self-sufficiency increased to a similar extent in the case of white sugar in Belgium, France, and Denmark (Table 10) and to an even larger extent in the case of butter in the Netherlands (Table 11). Reflecting the rise in production in Italy and France, the EC also increased its self-sufficiency in wine (Table 12), but the degree of self-sufficiency of the EC in fruit and vegetables (Table 13) fell in the 1960–84 period. In the case of the latter, the privileged access granted to Mediterranean countries (notably Israel and Morocco) contributed to a decline in self-sufficiency in all EC member countries but Greece. For meat in general and pork in particular, there was only a small increase in overall EC self-sufficiency (Tables 14 and 15) although Belgium and the Netherlands experienced substantial increases during the CAP period.<sup>39</sup>

### Trade

As a result of the rapid increase of production relative to consumption for most products covered under the CAP, the EC's agricultural exports have risen. Since the mid-1970s, the EC has become a net exporter of most temperate zone food products. This has been facilitated to a significant extent by export subsidies. As mentioned earlier, these exports have probably reduced prices in world markets. Currently, the EC is the world's second largest exporter of agricultural products, after the United States. The products exported by the EC include cereals (particularly wheat), wine, sugar, milk (including milk powder), butter, cheese, and meat (Table 19 in Appendix I). The EC's exports of beef exceed those of Argentina or Australia, and its sugar sales in world markets almost match those of Cuba. The EC, nevertheless, continues to be the world's largest net importer of foodstuffs: as a proportion of world trade in agricultural products, imports by all the member states of the EC (excluding intra-Community trade) amounted to 21.6 percent in 1983–85, while exports totaled 11.7 percent.

The influence of the CAP on trade flows in agricultural commodities is reflected too in the changing composition of trade within the OECD. Over time, the EC's share in total agricultural exports of OECD countries (including intra-EC trade) has increased. In the 1964–70 period, the EC's share of OECD agricultural exports was 45 percent and that of

<sup>34</sup> OECD (1987) and OECD (1988).

<sup>35</sup> The OECD treats the EC as a single entity for its computations, while the estimates on nominal protection presented in Table 5 are based on individual country and commodity data.

<sup>36</sup> These results are supported in a recent study by the U.S. Department of Agriculture (see U.S. Department of Agriculture (1987)).

<sup>37</sup> Self-sufficiency rates are calculated as the ratios of domestic production to consumption.

<sup>38</sup> It is not clear that this was entirely due to the CAP; the timing of the United Kingdom's entry into the CAP coincided with the adoption of higher-yielding seed varieties in cereals.

<sup>39</sup> It is, however, worth noting that the data on developments in EC self-sufficiency between 1960 and 1985 tend to underestimate the increase, since from 1973 onward the figures include the United Kingdom, which is a major net importer of food.

OECD agricultural imports, 60 percent (Tables 20 and 21). In the 1981–85 period, the EC's export share rose to 53 percent, while its import share declined to 56 percent. The gain in export market shares was most pronounced for the Federal Republic of Germany, and the decline in relative imports was the largest for the United Kingdom.

Also, the share of agricultural imports in total imports declined between the 1964–70 and 1981–85 periods in each EC country (Table 22). In the United Kingdom, this share fell from 27 percent in 1964–70 to 12 percent in 1981–85 and in the Federal Republic of Germany from 19 percent to 11 percent. The share of agricultural imports in total imports declined also for most other countries under consideration (quite sharply for the United States but only slightly for other countries). The share of agricultural exports in total exports, on the other hand, remained virtually unchanged on average for the EC over the same period while that in the other OECD countries fell appreciably (Table 23). There were, however, significant changes of this share in individual member countries with a substantial increase in the Federal Republic of Germany and Belgium, and a decline in most other EC countries.

As a consequence of the common market for agricultural products, one might have expected to see a higher degree of specialization in the production of agricultural products among EC countries and a rapid increase in intra-EC trade. Although some adjustment has taken place, the degree of specialization in agriculture is much less than that achieved in manufacturing.<sup>40</sup> Greater specialization in agriculture appears to have been inhibited by pricing policies aimed at keeping the marginal farmer in business; at the same time, of course, these policies produced large windfall gains for more efficient farmers.

## Stocks

Expanded agricultural output has given rise to growing public stocks. While the model of the previous section suggests that the share of agriculture in exports should have risen, not merely remained stable, it abstracts from stock-building behavior and therefore overemphasizes the role of exports as an outlet for surplus production of some products. Increases in the ratio of stocks to production have been particularly significant for butter, beef and veal, and skimmed milk powder (Table 24). By the end of August 1986, the value of the EC stocks had risen to ECU 12 billion.<sup>41</sup> In addition, there are privately held but publicly subsidized stocks of certain commodities, notably wine.

<sup>40</sup> Also, as pointed out by Jacquemin and Sapir (1988), while the Common Market led to "trade creation" in manufactures, the CAP led to "trade-diversion" and "seems to have effectively discriminated against non-partner suppliers" (pp. 137–38).

<sup>41</sup> This reflects the book value and not the market value of stocks at resale prices, which is considerably lower.

## Income and Employment

Despite the support given to the agricultural sector in EC member countries under the CAP, the share of value added in this sector in GDP declined in the 1960–85 period (Table 25). The decline was pronounced in Belgium, France, the Federal Republic of Germany, Italy, Ireland, and Luxembourg, but much smaller in the United Kingdom where the agricultural sector had already undergone substantial structural adjustment in the past. Similar structural change also took place in non-EC countries. In Spain and Portugal, which joined the EC in 1986, the structural change away from agricultural activities was much more pronounced in the 1960–85 period than in EC member countries. The same is true for Japan, but not for the United States or Canada. It would appear to be misleading, however, to attribute differences in structural change away from agriculture largely to the agricultural policies followed by a country; the level of development of a particular country also plays an important role.

In all EC countries and most other countries under consideration, agricultural employment fell and the share of agricultural employment in total employment decreased significantly in the 1960–85 period (Tables 26 and 27). The simulations of the previous section suggest that in the absence of the CAP the structural adjustment in agriculture would have proceeded even more rapidly.

With the exodus from the land, there was not only an increase in the average size of holdings but also in the relative importance of large farms. This is probably attributable to the price mechanism in the CAP, generating attractive returns for relatively large farms and creating incentives for them to expand further. As a result, between 1960 and 1985, the area taken up in the EC-10 by holdings larger than 50 hectares rose from 28 percent to 46 percent of the total (Table 28). Over the same period, the average size of holdings grew from 11 hectares in 1960 to 17 hectares in 1985 (Table 29). The pace of change differed significantly among countries, and the average size of holdings continues to vary considerably (Table 30). Holdings remain largest in the United Kingdom, where the average size rose to 70 hectares, followed by Denmark, France, and Luxembourg with around 30 hectares. They are smallest in Italy and Greece, where they average 8 hectares and 5 hectares, respectively.

Reflecting the restructuring of the agricultural sector toward larger farm sizes and the rapid pace of mechanization, labor productivity in this sector (measured as real value added per employed person) increased relative to total productivity in all EC countries, even though it remained well below the economy-wide level of productivity (Table 31). Agricultural productivity relative to total productivity also increased in the United States, Canada, Australia, and New Zealand, but not in Japan.

In its early years, the CAP rapidly boosted farm incomes,



as it continues to do in new member states during the period of adjustment to the common price level. But since 1974, real per capita incomes, measured as net value added at factor cost per annual work unit deflated by the implicit GNP deflator, appear to have stagnated (Table 32). This contrasts with per capita final output, which grew at an average rate of about 1½ percent over the same period, and reflects the decline in the agricultural terms of trade. Thus, for the average farmer, the developments of recent years mean that the major gains in income in the early period of the CAP are now being reversed.

## Financial and Economic Costs

In the 1980s, the bulk (i.e., around 70 percent) of expenditures in the EC budget has been allocated to the agricultural sector. In fact, between 1973 and 1986, expenditure by the EAGGF increased from ECU 4.1 billion to ECU 22.5 billion (0.7 percent of aggregate GDP in the EC), an increase of over 400 percent (Table 33).<sup>42</sup> In 1986, expenditures incurred on agricultural price support (included under the Guarantee Section) represented over 97 percent of the total. The remaining 3 percent (classified under the Guidance Section) was used to provide structural assistance to agriculture. In 1986, the major recipient of transfers from the EAGGF was France, followed by the Federal Republic of Germany and Italy. While the share in total receipts of France, the Federal Republic of Germany, and other members declined between 1973 and 1986, with the arrival of new members Italy's share increased, reflecting in part similarities in the agricultural sectors of Italy and the new members. Nearly one half of the expenditures under the Guarantee Section are spent on milk products, meat, eggs, and poultry—the commodities that receive high levels of protection (Table 34). In 1986, support to milk products constituted 24 percent of the total expenditure, whereas meat, eggs, and poultry producers received about 20 percent of the total. The other commodities whose producers received significant transfers under the pricing policy were cereals and rice, and fats and proteins.

National expenditures on agricultural support by member countries have been rising along with the increases in EC spending. Because of the considerable uncertainty regarding the expenditure on agriculture made directly by the member states through their own budgets, the Commission set up a team of consultants to shed light on this question.<sup>43</sup> Their report covers the period 1975–80.

<sup>42</sup> The EAGGF accounts for most of the appropriations for agriculture in the EC's common budget. Although most receipts in the EC budget stem from contributions by the members, some revenue is collected by way of import and certain agricultural levies. In addition, co-responsibility levies on milk and cereals generate revenues to finance specific expenditures. These levies are treated as measures to regulate agricultural markets; they are not recorded as revenue receipts but are subtracted from expenditures.

<sup>43</sup> See Commission des Communautés Européennes (1984).

Despite the caveats by the authors of the report, the factual findings are quite striking. In the period under review, national payments far exceeded EAGGF payments, in particular on account of social security benefits. In 1980, payments from national sources were more than twice as high as those from the EAGGF, with almost two thirds taking the form of social security benefits (Table 35).<sup>44</sup> In 1975, national payments had been four times as high as those from the EAGGF, with just over half in the form of social security benefits. The decline in the ratio was due primarily to the EAGGF gradually assuming a larger role. It is similarly revealing that France and Italy each accounted for around one third of total national payments, while the United Kingdom's share shrunk from 10 percent in 1975 to 5 percent in 1980 (Table 36).

The financial costs of price support are only part of the total costs. To get at the net economic costs to the member countries, one has to sum the various gains and losses in economic efficiency in product and factor markets that arise from the pricing policy. Given the extent of likely direct and indirect effects on resource allocation, such a task is rather complex. Nevertheless, numerous studies have been carried out to estimate the costs and benefits of the CAP by making simplifying assumptions.

The cost estimates are derived by following, broadly speaking, two approaches.<sup>45</sup> The first approach starts with the simple single-sector partial equilibrium analysis and extends to rather complicated multicountry and multicommodity models. Some models in the latter category incorporate 7 agricultural commodities and 30 countries or country groups with possibilities of intersectoral links and accumulation of stocks. The second approach uses so-called general equilibrium models (of the sort outlined in the previous section), which explicitly model sectoral linkages within and between countries. A summary of the results of recent studies is given in Table 37.<sup>46</sup> The estimates on domestic costs derived from these studies would suggest a loss of around 1 percent of the Community's GDP on average, with a range between 0.32 percent and 2.7 percent of GDP, depending on the sophistication of the model used, the country and commodity coverage, and the years examined. The results of those studies using the general equilibrium approach to assess the effects of the CAP on EC economies are similar to those reported in the previous section for the case of the Federal Republic of Germany.

The greater the degree of sophistication of the model in

<sup>44</sup> Net social security benefits, however, represent subsidies to agriculture only to the extent that they exceed net benefits granted to persons employed in other sectors of the economy.

<sup>45</sup> For a detailed survey on these studies, see Appendix III.

<sup>46</sup> The results from the OECD study (1987) can be construed to be based on a simple "partial" equilibrium approach, which implicitly assumes inelastic demand for agricultural products in the EC for estimating costs to the consumers. The expenditures incurred by both the national and the EC authorities on agriculture, on the other hand, are taken in the study to represent the costs to the taxpayers.

terms of intersectoral links and the further into the future that projections are made, the larger are the cost estimates. Given the complexity of the subject, however, these figures are little more than broad indications of the net effects of CAP. Nonetheless, two unequivocal conclusions emerge from the empirical work. First, the CAP redistributes large amounts of income to farmers, principally from consumers and secondarily from taxpayers. The former transfer has been estimated by one recent study (Tyers and Anderson, 1986a) to be as high as \$49 billion in 1980 dollars. OECD (1987) estimated the annual average cost of these transfers to the consumers and taxpayers in the EC to be ECU 11,437 per holding and ECU 7,465 per agricultural worker during the period 1979–81. That these transfers are inefficient is clear from the implied transfer ratios, defined as the cost to the economy of increasing farmers' incomes by one unit. All the studies point to the fact that the ratio is more than one—the exact magnitude varying between 1.17 and 3.23. Second, the distribution of costs is not uniform across countries. For instance, according to Buckwell and others (1982), in 1980 the transfer ratio was the highest for the United Kingdom (2.07), followed by Italy (1.87) and the Federal Republic of Germany (1.80). In contrast, the Netherlands, Ireland, and Denmark are assessed to be the benefi-

ciaries, with estimated transfer ratios of less than one (Table 38). Some recent studies indicate that Greece also gains slightly from being a member of the EC.

## Concluding Remarks

The simulations and historical analysis presented here (like the numerous other studies in the literature) have broadly confirmed the hypotheses about the negative effects of the CAP on EC member countries stated at the beginning. Some caution is warranted, however, in interpreting the size of these effects. Given the absence of properly specified “free-market” standards against which actual developments can be judged, the conclusions drawn from the historical analysis can only be indicative. The simulation results are dependent on the numerous simplifying assumptions implicit in the specification and parameterization of the model. Further research, aimed in particular at testing the sensitivity of models of this sort to small changes in specification and in parameter values, is needed before firmer conclusions about the exact magnitudes of the effects of the CAP can be drawn.

# IV The Effects of the CAP on the Rest of the World

The EC as a group is the leading importer and the second largest exporter of agricultural commodities in the world (excluding intra-EC trade) (Table 39 in Appendix I). Naturally, therefore, decisions taken in Brussels on agricultural prices and levies to control output growth end up influencing world prices and, over a period of time, the growth of the farm sector in the rest of the world. The Community's share of world exports is not only large but has grown since the inception of the CAP (Table 40). In the mid-1970s, the EC became a net exporter of most temperate zone food products. This development had a significant effect on the two-way trade in agricultural commodities between the developing countries and the EC, with the latter becoming a net food exporter and the former a net importer. Broadly speaking, in trade with the EC, temperate zone commodities are now imported by the developing countries and tropical commodities exported by them.

About half of EC exports of agricultural products are absorbed by the industrial countries (Table 41); of this a third goes to the United States and another third to non-EC Western Europe. A little more than 40 percent of EC exports are taken by the developing countries, of which one third is absorbed by 12 countries in the Mediterranean basin. The rest of EC exports go to state-trading countries. The picture with regard to imports is somewhat different (Table 42). The developing countries provide more than half of the total agricultural imports to the Community. The share of industrial market economies is around 40 percent, of which a third comes from the United States and the rest from non-EC Europe and the so-called "industrial Commonwealth" (Australia, Canada, New Zealand, and South Africa). State-trading countries account for the remaining 7–8 percent of EC imports.

## The International Effects of the CAP

There are three major identifiable effects of the CAP on the international economy. The first originates in the protection afforded agriculture through pricing policies that elicit excessive production in the EC and, it is asserted, reduce EC imports from the rest of the world and expand EC exports. This, accompanied by growing output in other parts

of the world without corresponding shifts in demand, has depressed world prices. The effect on world market prices has been further exacerbated, it is argued, by subsidized EC exports of excess production. The resulting trade flows at "distorted" prices influence the real incomes of the Community's trading partners.

Second, price support in the EC insulates domestic markets from external commodity price fluctuations, thereby destabilizing world commodity prices. Because variable import levies insulate domestic prices in the face of world price changes, the effect of output changes in the rest of the world are not reflected in the EC's domestic prices, nor do they elicit any supply or demand response within the EC. This means that the rest of the world must adjust more to any quantity shifts, amplifying price instability there.<sup>47</sup>

The third effect is related to the second. The greater the fluctuations in world prices, the greater is likely to be the instability of incomes of agricultural producers and exporters. When combined with risk-averse behavior in production, this instability could cause farmers to contract output, thereby lowering their incomes. This effect is expected to be stronger in poorer countries, since farmers there have a reduced access to insurance markets.

Attempts at estimating the magnitude of such international effects of the CAP have followed approaches similar to those used in estimating the domestic economic costs (discussed in Section III). The two methodologies—partial equilibrium and general equilibrium—contain models ranging from simple one-good models to multisector, multiregional stochastic models.<sup>48</sup> The quantification of effects has been limited to the first two effects, with the third discussed only in theoretical terms. The results from these models are discussed below.

## Effect on Prices, Trade, and Welfare

The debate on the CAP depressing world prices has centered on its impact on the terms of trade of importing and

<sup>47</sup> This argument would be weakened if the management of stocks by the EC contributed toward stabilizing world prices. There is, however, no evidence in favor of countercyclical stock management by the EC.

<sup>48</sup> For details, see Appendix III.

exporting countries. Countries exporting CAP commodities (mostly developed countries, such as the United States and the industrial Commonwealth) lose from the excess production of the EC. On the other hand, developing countries whose agricultural exports do not compete with EC exports could benefit because of lower prices for imported food and increased demand within Europe for substitutes for high-priced domestic agricultural products.

It has to be borne in mind, however, that the existing trade pattern in which developing countries emerge as net importers of food has been greatly influenced by the operation of the CAP itself. A liberalization of the CAP might induce developing countries to produce temperate zone commodities domestically and ultimately even provoke a switch from their being net importers to their becoming net exporters. It is difficult to assess the potential for such a switch in the food-importing developing countries, but the success of some developing countries (particularly in Asia) in expanding food output suggests that it may be considerable. Higher domestic prices for CAP goods in the Community may also have stimulated the demand within the EC for substitutes produced by developing countries. The benefit to developing countries from higher prices for these substitutes is offset, however, by lower world prices for the goods protected by the EC which, in turn, discourage demand in the rest of the world for these substitutes produced by developing countries.

A number of studies have attempted to estimate the impact of an abolition of the CAP on world prices. All of them conclude that the CAP does indeed exert downward pressure on the actual price level (Table 43). The effect is stronger for commodities that face high rates of protection, such as dairy products, grains, and ruminant meat. Consequently, according to the studies referred to in Table 43, a liberalization of EC markets would raise world prices for different commodities ranging from 0.1 percent (for rice) to over 28 percent (for dairy products). The recent OECD (1987) study has estimated the effect on world prices of a 10 percent across-the-board unilateral cut in the level of protection afforded by the CAP. This partial liberalization is estimated to increase prices of most commodities in world markets, from 0.55 percent, for sugar, to 2.91 percent, for milk. For grains, however, the study concludes that prices would actually fall in response to diminished demand by livestock producers. This result stands in contrast to the other estimates referred to.

The various studies indicate that an abolition of the CAP would lead to an expansion in world commodity trade, which could increase in volume for barley and maize by as much as 68 percent. For most commodities, a lowering of both consumer and producer prices in the EC would turn the Community into a net importer and the developing countries into net exporters (Table 44). As expected, the effect is stronger in the most heavily protected commodities, such as dairy products, coarse grains, and wheat.

The changes in prices and quantities traded make it possible to calculate the effects the CAP has on the real income of the Community's partners. A hypothetical liberalization of the CAP should, a priori, affect both the non-EC industrial countries and the developing countries. Partial analysis of the effects (Table 45) results in two general conclusions. First, the size of the total effect on each of the two country groups is not large in proportion to GDP or total export earnings. Second, developing countries as a group stand to lose from the abolition of the CAP, while the effect on industrial countries is ambiguous.

These conclusions, however, need to be treated with caution as the computation of net effects conceals the distribution of gains or losses among individual countries. First, net effects in the industrial countries mask the significant cost to Japan of a liberalization of the CAP, which is offset by gains in some of the other countries in the group. The distribution of the effects within the developing countries group is also uneven, depending on whether the country is a net exporter or importer of temperate zone products. The gains and losses from a liberalization have been estimated to be substantial for some countries—for example, in 1980 dollars, Argentina would gain \$200 million a year and Korea and Pakistan would each lose \$300 million a year. Second, results showing losses for the developing countries from unilateral liberalization in the EC assume that higher world prices would not elicit greater production of temperate zone commodities in the developing countries. Moreover, these results are derived from models covering only the CAP commodities; a policy reform in the EC could be expected to liberalize the markets for all agricultural commodities. Furthermore, the models employed capture only the direct price effects in a partial equilibrium setting. A liberalization of agricultural markets in the Community would impinge also on the nonagricultural sectors, factor markets, and, ultimately, aggregate incomes in the EC's trading partners.

That effects on other sectors are significant is supported by studies that use a general equilibrium approach.<sup>49</sup> The results of these studies indicate that if trade in agricultural commodities were liberalized in the EC today, total income of the developing countries as a group would be higher in the medium term. While the assumptions underlying the model certainly influence the results, it is plausible that partial equilibrium models underestimate the potential benefits to the developing countries. In any case, most models overlook the effect on developing countries of higher real incomes in the EC as a result of the efficiency gains from a liberalization of the CAP. Higher income in the EC would in turn increase the demand for exports of developing countries.

<sup>49</sup> Burniaux and Waelbroeck (1985) and Loo and Tower (1988).



### Effect on Price Stability

The studies surveyed in Table 46 conclude that a significant part of the variability in world prices is attributable to the CAP. The effect of the CAP on variability would seem to be largest for dairy products and wheat. Despite differences in the methodologies used, the various estimates are quantitatively fairly similar, with the exception of those for wheat, nonruminant meat, and coarse grains. Even when compared with price support schemes in other countries, the CAP has been found to be a significant destabilizing factor in world markets. The study by Sarris and Freebairn (1983) concludes that the CAP accounted for more than half of the excess variability in the price of wheat over its global free trade level. Blandford (1983) concludes that the EC has transmitted a larger absolute amount of price variability to the world grain market than any other producer.

### Concluding Remarks

The partial equilibrium analyses reviewed in this section

fail to establish a clear interest for developing countries and other non-EC industrial countries in dismantling the CAP. As the discussion in this and the preceding section showed, however, partial equilibrium analysis is unlikely to capture the full effects of agricultural trade liberalization. Indeed, the studies by Burniaux and Waelbroeck (1985) and Loo and Tower (1988) suggest that a removal of the CAP would result in a gain for the developing countries as a group when all general equilibrium effects are taken into account. Moreover, if barriers to trade in agricultural commodities were removed in all OECD countries, the trade gains for developing countries would probably be more significant.<sup>50</sup>

The second benefit of liberalization would arise from greater price stability in world markets; there is convincing evidence that world agricultural prices are indeed destabilized by the EC trade barriers.

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<sup>50</sup> See, for example, Valdes (1987).



# V The Approach to Reform

Reform of the CAP entered a new phase in February 1988 when the European Council of Heads of State or Government agreed to bring agricultural support under closer control and, with the help of the improved policy instruments, to lower its level. A new situation has arisen inasmuch as the Community is now better equipped than before to keep policy on target. This is so because of (i) the adoption of greater budgetary discipline, that is, rules to ensure that agricultural appropriations in the common budget are not exceeded, and (ii) the completion of an extensive review of the policy instruments available for individual commodities. That better instruments are available, however, does not mean that all problems have been solved. Indeed, the level of support remains high. Furthermore, even the European Council's present objective regarding the level of support may prove beyond reach without further policy adjustment because of the scope for farmers to defeat measures of restraint by changing the structure or the level of output. A new situation has arisen also in another respect: the Community now wants any further reduction in the level of support (i.e., beyond that implicit in the policy package of February 1988) to be decided upon in the context of the policies pursued by the other industrial countries. Thus further action to lower agricultural support will be contingent on similar action in other industrial countries.

This section reviews the debate on surplus agricultural production and what to do about it, and then describes the main reforms introduced in recent years.

## The Debate on Reform

The policy debate is reviewed here in light of the Commission's work, with no attention to the differences of views among national authorities and farmers. For a correct understanding of the developments, however, it is important to bear in mind that the Commission and the national agricultural authorities have their specific tasks and do not face the same problems. The Commission, reflecting the very nature of its functions and responsibilities, has taken a broader view of the problems at hand. While determined to strengthen agriculture and mindful of the interests of farmers, it has paid more attention to the Community's high

level of self-sufficiency and has been concerned about the budgetary and international implications of surplus production. For equally understandable reasons, the national agricultural authorities have tended to focus more on the needs of their respective agricultural sectors. In particular, they have been concerned to protect the relative income of their farmers. And they have tended to be wary of Community-wide measures to combat surplus production, most notably when their respective countries were not self-sufficient in particular products or when they felt that their agricultural sector would have the ability to gain market shares within and, perhaps, also outside the Community.

## The Early Stages

The issues facing policymakers and the arguments put forward in the discussion on policy have remained largely unchanged since the inception of the CAP. Surplus production and its budgetary and international implications were actually discussed at the Stresa conference—that is, even before the formation of the CAP. At that time, the immediate objective was to forge a common policy on prices and markets, and prospective difficulties were relegated to subsequent discussions. Once a common policy had been agreed upon, the discussion on the shape of policy was given a clear focus and a forceful impetus in December 1968 by the Commission's "Memorandum on the Reform of Agriculture in the European Economic Community."<sup>51</sup> Because of the leading role played in its conception by the then Vice President of the Commission responsible for agriculture, this Memorandum is usually referred to as the Mansholt Plan.

The central idea of the Mansholt Plan was that the CAP was relying too much on pricing policy. Because institutional prices were set at an unduly high level, it was argued, they were giving rise to surpluses that had to be taken off the market at rapidly rising costs. At the same time, the high prices were failing to achieve the social goals of the CAP because they were too low to ensure an adequate income to the majority of farmers who, on their uneconomically small

<sup>51</sup> Communauté Economique Européenne, Commission (1968).

and inadequately equipped holdings, were producing a relatively small proportion of total output. The Memorandum inferred from this that the problems of agriculture were of a structural nature in the sense that pricing policy could not achieve its twin objectives—stabilizing production at the level of demand and ensuring farmers an adequate income—unless the vast majority of farms became economically viable. There were no indications that this change was taking place spontaneously. Despite the exodus from the land, most farms remained too small, in particular in the sense of not offering sufficient scope for achieving an adequate return on the investment needed to put production on an up-to-date footing.<sup>52</sup> These considerations led to two closely related recommendations. First, prices should be lowered so as to eliminate surplus production, but with due regard to the market situation of individual products. Second, structural policies should facilitate the achievement of holdings of an economical size, with adequate investment.

The Mansholt Plan proved to be most controversial. The farmers' professional organizations generally saw it as an attack on the family farm as the mainstay of European agriculture. There was particularly firm opposition to measures designed to take land out of production. This forced the Commission to modify the proposals which it had made in light of the Memorandum. After several years of often difficult negotiations, a number of directives were approved by the Council of Ministers with a view to facilitating the modernization of agriculture. Help would be extended to farmers who either were ready to modernize their holdings in a comprehensive manner or wanted to give up farming. The land sold by the latter would then be made available to the former. It is not possible to gauge the impact of these directives on the basis of available data, as both modernization and an exodus from the land were already taking place before their adoption. From the perspective of the formulation of policy, however, they were important inasmuch as their negotiation helped focus attention on some of the main issues.

## Recent Developments

The problems identified by the Commission in 1968 have persisted, despite significant social and economic progress. The debate started by the Mansholt Plan has therefore continued to this day, along broadly unchanged lines. Most recently, it has taken the form of a broad discussion of systemic issues on the basis of a "green paper" issued by the Commission in July 1985.<sup>53</sup>

The Green Paper's main theme was that the CAP had

reached a turning point because constraints in the areas of foreign trade and budgetary finance made it imperative to curb surplus production. Surplus production was not a passing phenomenon, it was argued, but was bound to worsen. Demand for agricultural products in the Community was rising at a long-term trend rate of  $\frac{1}{2}$  of 1 percent a year, while production was growing at a rate of  $1\frac{1}{2}$ –2 percent. At the same time, there was a large increase in output in the rest of the world, and the countries that might still need to import from the Community were generally short of foreign exchange. According to the Green Paper, the change in policy that was needed and had recently been initiated required reducing the "emphasis" on price support. Quantitative controls were not an alternative solution. Their adoption admittedly offered considerable short-term advantages, notably an immediate impact and a lesser need for price restraint, but, in the longer term, they were bound to have an adverse effect by freezing production structures. In addition, they were cumbersome to administer. It was therefore imperative to fix institutional prices at levels that provided clear and appropriate signals to producers. This, however, called for structural measures to ensure that agriculture continued to play its proper social role (regional development, protection of the environment, etc.) and to avoid unduly penalizing farmers in "less favored areas." Such structural measures could include an increase in the relative importance of direct income aid as a step toward dissociating support from output.

On the basis of the Green Paper, the Commission held consultations with national authorities and professional organizations about the policies that could best be pursued to solve the problems at hand. It then presented its conclusions as a comprehensive set of tentative guidelines in December 1985.<sup>54</sup> This was accompanied by a note of caution on the speed at which change could be expected to take place. The guidelines covered a broad range of policy areas, of which two are of immediate interest: price and market policies (the various mechanisms that are used to maintain prices, such as institutional prices and intervention) and policies on structures (including the rationalization of production, increases in the size of holdings, and limitations of production potential). What the Commission advocated was in effect a two-pronged strategy to reduce surplus production and lower the budget costs of the CAP. This involved making support less generous and increasing the role of market forces, on the one hand, and making agriculture as a whole more competitive and, thus, less dependent on support, on the other.

The Commission took the view that the scope for a policy of restraint in the area of institutional prices was limited because its impact on output was a gradual one. It therefore recommended that it be combined with measures to limit the availability of price support. Two types of measures should be used to that end. One was "producer co-responsibility,"

<sup>52</sup> There was no attempt at precise quantification in the Memorandum, but it was argued that 80 percent of all holdings were too small to keep one man fully employed because modern technology would enable him to cultivate 30–40 hectares or raise at least 40 milk cows.

<sup>53</sup> Commission of the European Communities (1985d).

<sup>54</sup> Commission of the European Communities (1985a).

which has been applied to some extent in the Community since 1977 and amounts to letting farmers bear part or all of the costs of disposing of surplus production. The other measure was essentially a reduction in the availability of intervention: farmers should no longer have a secure outlet for unlimited quantities at a fixed price. Instead, intervention should become a safety net in the event of unstable market conditions, as it was originally intended to be. The Commission argued that, as the CAP became less generous, measures should be taken to counter the possible adverse social consequences by extending income support to small farmers. Furthermore, it advocated structural measures to increase the capacity of agriculture to face international competition. The latter would include measures to reduce production by less efficient producers, including the granting of early retirement pensions to farmers aged 55–65.

## Recent Measures of Reform

The most recent agricultural reforms must be seen as part of an extended round of negotiations that started, somewhat hesitantly, in 1982–83 and progressively gained momentum. Actual measures were initially negotiated mainly in the framework of the annual policy reviews, but the discussion was broadened to include more systemic issues after the issuance of the Commission's Green Paper in mid-1985. The impetus for reform, which gained strength from 1984, has broadly followed the guidelines set by the Commission.

The policy package of February 1988 (a part of which has not yet been implemented at this writing) represents a turning point in this slow and difficult process because it introduces a budgetary guideline to ensure stricter adherence to commitments of restraint. At the same time, it greatly enlarges the tool kit of instruments to control the level of support for each commodity or group of commodities. It may be noted that this entails no increase in the degree of border protection, be it directly or indirectly.<sup>55</sup> To soften the impact of the tightening of policy, it has also been agreed to broaden the scope of direct aid—grants based on social criteria, incentives to take early retirement, and the set-aside of land—which are related to income rather than output levels. Such aid, however, is to play no more than a complementary role and is therefore to be kept on a small scale.

Strict budgetary discipline is fundamental to the success of agricultural reform. In its absence, as shown by experi-

ence, efforts to rein in expenditure are bound to fail. In the past, this happened in two ways. First, appropriations were not binding in practice because intervention was open-ended at the support prices adopted for the marketing years concerned. Second, there was nothing in the budgetary rules to prevent the level of support from being raised in the annual policy reviews.

The budgetary guideline agreed upon in February 1988 amounts to a ceiling on the annual growth rate of agricultural appropriations. Also, restrictions have been imposed on the transfer of unused appropriations from one commodity to another. The restraint needed to avoid an overshooting of the ceiling should therefore not be across-the-board but should vary according to each commodity's performance in the light of its own threshold. As of now, the appropriations for agricultural support are to increase from one year to the next by not more than 74 percent of the growth rate of the Community's GNP, with appropriations amounting to ECU 27.5 billion for 1988 as the reference for the calculations.<sup>56</sup> In preparing the draft budget for 1989, which it has recently submitted to ministers, the Commission has abided by this guideline. In agreement with the policy package of February 1988, however, leeway has been provided for by creating a "monetary reserve" of ECU 1 billion that may be resorted to when appreciation of the ECU against the U.S. dollar causes expenditure (on export subsidies) to rise by ECU 400 million or more. In addition, there are separate provisions for financing the depreciation of the stocks that have been built up by the member states through intervention on behalf of the Community.

The other measures of restraint that have been adopted are generally referred to as "stabilizers" because they are meant to constitute ceilings on spending per product or, as the case may be, category of products.<sup>57</sup> In the main, two types of stabilizers have been adopted. First and foremost, guarantee thresholds—that is, arrangements whereby production in excess of a specified level is penalized by a subsequent reduction in the support price—are imposed for most products or, where they already exist, are made more constraining. Guarantee thresholds are very different from production quotas, such as currently exist for sugar and milk, in that they apply to the Community as a whole, instead of to individual producers, and therefore leave room for competition. The second type of measures involves limiting intervention in time and volume so that market forces will have greater sway.

While it would be premature at this stage to assess the likely impact of the measures taken as part of the policy package of February 1988, a few broad observations may be made. The level of agricultural support will remain high;

<sup>55</sup> This needs mentioning because of the long discussion on a controversial proposal to tax vegetable and marine oils and fats. This proposal has now been shelved because of the opposition of several member states, who objected to its price-raising effect, as well as of foreign suppliers. Oilseeds and vegetable oils enter the Community duty free under a regime that is bound in the GATT. In the view of its proponents, the tax would be justified *inter alia* because, at the time of a reduction in the support to the Community's growers, equity would call for outlets in the Community also to be made less attractive to growers from third countries. For the arguments in favor of the tax see Commission of the European Communities (1987b, Annex II).

<sup>56</sup> See Commission of the European Communities (1988b, Section IV, Part C).

<sup>57</sup> For the arguments that have been put forward in favor of the adoption of the stabilizers, see Commission of the European Communities (1987e) and (1987c).



that, indeed, is the intention of the authorities. Also, there is a risk that the measures taken will prove less restrictive than is hoped for. The latter is suggested by two considerations. First, the budgetary guideline reduces the room for real increases in agricultural expenditure but does not eliminate it. Much will depend, therefore, on the political will to exercise restraint in the annual price reviews so as not to impair the workings of the stabilizers. Second, the stabilizers could turn out to be insufficiently tight and, as is discussed below, leave room for farmers to shift production toward less regulated products.

The rest of this section is devoted to the changes in the mechanism of the CAP introduced in recent years to make agricultural support less generous. These changes are discussed under four headings: pricing policy, reducing the scope of the MCA system, restricting the availability of benefits, and complementary measures.

### Price Restraint

Since 1983, the Community has endeavored to pursue a restrictive pricing policy as part of the effort to curtail surplus production. In reports by the Commission, the stance of the pricing policy is often assessed by comparing the index of support prices in national currencies with the rate of inflation as measured by the GDP deflator. On the basis of this comparison, pricing policy has indeed been restrictive in recent years (Table 47). This comparison, however, yields no information regarding the relationship between support prices and marginal costs; that is, it gives no indication of the extent to which price developments may have been disincentives to production. As described in Section III, output continued to grow in the 1980s and in 1984–86 it was on average 8 percent higher than in 1980–81. Largely because of a further deterioration in the ratio of producer prices to the prices of intermediate inputs, the increase in production merely kept real income per employed person roughly stable, so that the significant income losses of the 1970s were not made good.<sup>58</sup>

Political and technical obstacles appear to have prevented pricing policy from making a major and rapid contribution to the elimination of surplus production. The political obstacle has been the determined opposition to reducing nominal support prices in terms of national currencies. The strength of this opposition is indicated by the resistance to the dismantling of positive MCAs in the Federal Republic of Germany, the only country—disregarding the Netherlands' much smaller positive MCAs—where nominal price reductions have been an issue. Technological progress and the open-endedness of intervention have constituted further obstacles because of the scope they give to offsetting the

impact of price restraint on incomes by, respectively, increasing productivity and expanding production. As is explained below, important measures have been taken in recent years to curtail intervention.

Matters now appear to have begun changing for the better. Pricing policies are likely to become more effective in restraining surplus production as a result of the recent measures to curtail intervention. These measures should serve to strengthen the role of market forces (in the periods of the year when there is no access to intervention) and to reduce the room to offset the income effect of less attractive prices by greater output. Furthermore, the scope for a restrictive pricing policy has been broadened by the policy package of February 1988. This is mainly so because the adoption of guarantee thresholds should entail price reductions whenever output is in excess of target (see below). The annual price reviews should only play a supporting part in this context in that they should be geared mainly to preventing the adopting of price increases that weaken or nullify the effect of the thresholds.

### The Agrimonetary Arrangements

As part of the drive to curb the growth of agricultural expenditure, MCAs have been made less comprehensive, that is, there has been a reduction in the extent to which they offset the gap between market exchange rates and green rates.<sup>59</sup> Further steps in this direction were taken in June 1987, as part of the annual review of agricultural prices and policies. Specifically, it was decided to use lower prices than before to calculate the MCAs of some commodities, and there were selective increases in the so-called neutral margins that are deducted from the calculated monetary gap to obtain the applied monetary gap.

In a recent policy paper prepared under the obligation of member states to review the decision of March 1984, the Commission calls the MCA system a "necessary evil";<sup>60</sup> however, the Commission believes that the system should be discontinued by 1992, when the "completion" of the internal market will have been achieved. It is precisely to facilitate this development that the Council of Ministers, acting on a proposal by the Commission, adopted at the end of June 1987 a scheme for the phasing out of new MCAs created as a result of realignments in the European Monetary System (EMS). The practice of creating only negative MCAs has been retained, but a distinction is made between "natural" MCAs, which would have been created also under the old system using the ECU as numeraire, and "artificial MCAs," which owe their existence to the switch from the ECU to the strongest currency in the EMS exchange rate mechanism. The point of this distinction is that 25 percent

<sup>58</sup> Real income is defined here as value added at factor cost minus rents and interest payments.

<sup>59</sup> For a definition of the green rate, see Appendix II.

<sup>60</sup> Commission of the European Communities (1987d, p. 3).

of the artificial MCAs created on the occasion of a realignment are to be eliminated at the start of the following agricultural marketing year through a reduction in the Community-wide price level expressed in ECUs. In member states with sufficient negative MCAs, their phasing out will prevent this provision from causing a reduction in support prices expressed in national currency. Member states whose prices would have to decline will be entitled to grant farmers aid financed from their own budgets, provided it is not linked to the volume of output. The remainder of the MCAs, be they artificial or natural, are to be phased out in specified installments to be completed by the beginning of the third marketing year following the realignment, with a ceiling of 30 percent on the amount of natural MCAs that may be eliminated at the time of the realignment. Thus, the new system aims at both making sure that MCAs will be phased out and preventing devaluing countries from rapidly improving the relative income position of their respective agricultural sectors.

### Restrictions on Entitlements to Support

Over the years, increasing efforts have been made to reduce the budgetary costs of the CAP through arrangements that restrict the availability of support. These measures may be classified in three categories: co-responsibility levies, guarantee thresholds, and limitations on the scope for intervention,<sup>61</sup> although individual measures may be hybrids or be effective only in conjunction with a measure of a different category. Co-responsibility levies are meant to let producers share in, or bear, the cost of price support. Guarantee thresholds serve the same purpose by penalizing surplus production through reduction in the intervention price in the period following the one in which the threshold has been exceeded. Both co-responsibility and guarantee thresholds reduce the level of support but not its availability.<sup>62</sup> In contrast, recent decisions to limit the scope of intervention reduce the availability or the degree of support formally without altering the support price. They strengthen the role of market forces by compelling farmers to pay greater attention to demand with regard to both quantity and quality. Originally, intervention was to serve only as a safety net in exceptional circumstances, but it rapidly became permanent and unlimited. Restricting its availability therefore represents a major change in the functioning of the CAP.

Co-responsibility has been applied from the start to sugar. The availability of benefits—intervention and export subsi-

dies—is limited to production quotas that are set annually on the basis of a five-year moving reference period. The benefits are financed from a levy on output that is paid by the sugar manufacturers who shift it back to the beet growers. Other co-responsibility schemes are less comprehensive. There has been one for milk since September 1977 and another for cereals since the beginning of the 1986/87 marketing year, with levies that currently stand at, respectively, 2 percent and 3 percent of the target price. The yield from these levies is only a fraction of the support granted through the EAGGF—an average of about 10 percent for milk and cereals combined<sup>63</sup>—and the restraining impact on output is not believed to be significant.

When guarantee thresholds were introduced in the early 1980s, the typical arrangement was that when output exceeded a given volume, the intervention price for the following marketing year was to be a certain number of percentage points lower than it would otherwise be, subject to a maximum adjustment. Such thresholds were adopted for milk, cereals, and rape and sunflower seeds. They turned out to be rather ineffective, mainly because of the absence of provisions to prevent price support from being raised to such an extent as to nullify the reduction in support triggered by the crossing of the threshold. They were therefore abandoned or replaced by arrangements to reduce the availability of support. They have now made a comeback under the European Council's agreement of last February because it is assumed that the simultaneous strengthening of budgetary discipline will make it impossible to circumvent them. In particular, they have been adopted for cereals (for a five-year period starting in marketing year 1988/89) and have been reinforced for oilseeds (by removing the limit on the reduction in the support price that may be imposed in the year after the threshold has been exceeded). At the same time, as discussed below, arrangements remain in force to control (milk and sugar) or make less attractive (beef) the production of the other main products. The question, however, is whether the penalty for exceeding the threshold for cereals—a maximum reduction in the support price of 3 percent—is not too low. Indeed, there appears to be a risk, and a serious one at that, of farmers shifting production into cereals because of the tightening of the regimes for other products, notably oilseeds. If this were to happen, it would of course call for a new policy review.

Narrowing the scope of intervention—the third category of measures taken to bring the cost of the CAP under control—amounts to curtailing its open-endedness. This may take two forms: production quotas and various restrictions on buying-in by intervention agencies. Quotas imply that when the output of a producer or, depending on how the scheme is being administered, the producers of a region exceed a specified level, levies are imposed to ensure that the effective price paid for excess production is low or nil.

<sup>61</sup> The nature and the use made of these measures through 1984 is surveyed in Commission of the European Communities (1985c). As indicated by the title, the term "guarantee threshold" is used in a very broad sense.

<sup>62</sup> The close relationship between the two concepts is underscored by the fact that guarantee thresholds are mentioned in some reports by the Commission as instruments to implement co-responsibility.

<sup>63</sup> See Commission of the European Communities (1987e, p. 12).

This is effective because the products to which it is applied are in excess supply, so that farmers cannot but sell to intervention agencies. Restrictions on buying-in are mainly of two types: limitations on the periods during which resort to intervention agencies is possible and discounts from guaranteed price levels for lesser qualities. Limiting the period of intervention strengthens market forces by forcing farmers to choose between (i) carrying stocks themselves until such time as sales to intervention agencies again become possible, or (ii) selling on the market at a price that would almost certainly be lower than the support price. The same objective is pursued by reducing the attractiveness of producing lesser qualities for which intervention is the only outlet.

The first step taken to end the open-endedness of intervention was the introduction in 1984 of production quotas for milk.<sup>64</sup> These quotas not only left a surplus production of around 10 percent but, as it turned out, could have been exceeded by misusing provisions that were intended to provide some flexibility.<sup>65</sup> This prompted the Council of Ministers, in December 1986, to adopt measures designed to eliminate surplus production during 1987–89.<sup>66</sup> Quotas will be reduced in two steps by a total of 8.5 percent, with 3 percent through buying-in on a voluntary basis and 5.5 percent through a uniform reduction (with financial compensation). The tightening of some of the provisions related to overruns of quotas is expected to have an effect equivalent to a 1 percent reduction in production, essentially by raising the penalty for surplus production paid by some farmers. At the same time, it was decided to increase the role of market forces by suspending intervention for skimmed milk powder from September to February, and to make suspension possible for butter as well as skimmed milk from March to August, if intervention exceeded specified quantities.

In April 1986, it was decided to limit the intervention for cereals to a number of months a year. In addition, the full support price would be paid by intervention agencies only for wheat of bread-making quality. Lesser quality wheat and other cereals used in animal feed would rate a price that could be lower by as much as 5 percent, depending on the quality. In December 1986, the Council of Ministers also decided to end unconditional permanent intervention for beef and veal; however, they temporarily increased the deficiency payments, granted to breeders in the forms of

various premiums (available in some or all member states), to cushion the impact on incomes of the reduced availability of intervention.

These measures, although important in themselves, are proving insufficient to bring agricultural expenditure under control. As already noted, the current negotiations, aimed at a lasting solution to this problem in the context of budget discipline and finance, are proving laborious. In preparation for the negotiations, the Commission has put forward a comprehensive set of “stabilizers,” that is, administrative mechanisms that would make it possible to enforce a ceiling on spending per product or, as the case may be, category of products.<sup>67</sup> The Commission has stressed that such mechanisms should be adopted simultaneously for all products in order not to elicit shifts of production into less tightly regulated products, thereby defeating the purpose of the reforms. Also, the Commission sees a need for some flexibility in the management of these mechanisms and believes that it should therefore be given some latitude in dealing with unforeseen developments, that is, without having to ask the Council of Ministers to negotiate appropriate adjustments to the rules and regulations. The substance of the changes in the administrative mechanisms proposed by the Commission is the imposition of a guarantee threshold for each product, with a dissuasive reduction in the support price for production in excess of the threshold, and the limitation of intervention in time and volume in order to give market forces greater sway. Guarantee thresholds are very different from production quotas, such as currently exist for sugar and milk, in that they apply to the Community as a whole, instead of to individual producers, and therefore leave room for competition.

### Complementary Measures

As already mentioned, greater use than before is to be made of aids not related to output in order to facilitate adjustment to the change in policy. While much emphasis is being put on the social and regional role of such measures, they too are on the whole designed to help restructure the agricultural sector in such a way that it becomes less dependent on support. The complementary measures recently introduced or about to be adopted have various different objectives: (i) to help reduce the number of people employed in agriculture and, to some extent, take land permanently out of production; (ii) to lower the level of production with the help of financial incentives that are granted on a temporary basis; and (iii) to supplement incomes with direct aids in cases where the tightening of the CAP causes hardship. These measures may be called complementary, irrespective of what their precise impact will turn out to be. First, participation in the schemes adopted for their imple-

<sup>64</sup> This decision was taken for a five-year period, but there appears to be good reason to assume that quotas will continue to be used after the end of the marketing year 1988/89. In a recent document, the Commission expressed the view that “the production cuts resulting from the suspension of the quotas must be consolidated” under the arrangements that will be applicable as of the marketing year 1989/90. See Commission of the European Communities (1987e, p. 14).

<sup>65</sup> For a summary of the problems facing the milk sector see Commission of the European Communities (1986a, pp. 1–10).

<sup>66</sup> See Commission of the European Communities, *Bulletin*, No. 12 (1986), pp. 14–15 and 85–89, and the relevant sections of Commission of the European Communities (1987b).

<sup>67</sup> See Commission of the European Communities (1987e) and (1987c).



mentation is voluntary (but the national authorities are under the obligation to make them available, with the adjustments considered necessary in the light of conditions in their respective countries). Second, prices and marketing policies remain the core of the CAP.

Several schemes have been drawn up to implement the complementary measures.

(i) The Community has adopted a scheme to encourage farmers over the age of 55 to cease farming.<sup>68</sup> It is intended to serve various purposes: to assist those likely to find adjustment to the tightening of the CAP most difficult; to help reduce excess production; and to contribute to an improvement in farming structures. Under the scheme, farmers over 55 years of age will receive an annual allowance if they cease permanently all farming activities. This will mean that commercial production is halted until the time when the farmer reaches the retirement age fixed by his country. Alternatively, the agricultural area may be used to enlarge other holdings, provided the farmers concerned undertake not to increase the production of surplus products on the total area of their holdings. The maximum amount of the allowance has been set at ECU 3,000 a year per holding and may be granted for a period of up to ten years, but not beyond the recipient's 70th birthday. The EAGGF will assume 50 percent of the expenditure in the case where farming is halted and a variable percentage when the land is added to other holdings. There are also provisions for allowances to salaried workers and permanent family workers. The total cost of the scheme to the EAGGF is estimated at ECU 465 million for the first five years.

(ii) A scheme has also been adopted for the set-aside of arable land, and farmers will be encouraged to make greater use of arrangements aimed at a less intensive use of land and at the conversion of production away from those commodities in which there are already surpluses.<sup>69</sup> Aid for set-aside may be granted for all arable land, irrespective of the crops grown, provided that it has indeed been cultivated. If a farm is to qualify for aid, the arable land must be withdrawn from production for at least five years (with the possibility of termination after three years) and must represent at least 20 percent of the total. The amount of aid, all of which is to be paid by the national authorities, shall be in the range of ECU 100–600 per hectare a year, but may reach ECU 700 in exceptional cases. Farmers who set aside at least 30 percent

of their land qualify for some additional incentives.

(iii) No decision has as yet been taken on direct income aids, in part because the proposals put forward by the Commission were considered too difficult to implement. The Commission has now tabled new proposals, which provide for aid by both the Community and the national authorities.<sup>70</sup> The aim is to complement the schemes discussed under (i) and (ii) in the sense that the aid should accrue to those who are financially weakest and not in a position to benefit from other schemes. The Commission proposes that aid should be of a temporary nature (i.e., be granted for not more than five years) and be made available in areas that have been demarcated by the national authorities in the context of a so-called aid program. Individual eligibility and entitlement would be determined in the light of indicators of relative income with a view to ensuring that the benefits accrue to the least affluent. Community financing would be available only for farms that are run by someone whose professional activity is mainly in agriculture.

## Concluding Remarks

The European Community has made determined efforts to bring agricultural expenditure under control, both because support policies are recognized to be inefficient and in order to free additional resources for structural policies for regional development, social policy, and, last but not least, agriculture itself. Also, it is hoped that reform will help attenuate the frictions with other industrial countries on agricultural trade, and there is keen awareness of the importance of agricultural trade and agricultural reform in the EC for many developing countries. But there is no intention of going as far as dismantling the CAP. Indeed, it is highly valued as an instrument that may be of major help in areas such as regional development and the protection of the environment. At the same time, however, the Community acknowledges the desirability of a further reduction in the level of agricultural support. But it will not proceed unilaterally. Its position is that it will reduce the level of support provided other industrial countries share the burden of reform by undertaking corresponding measures.<sup>71</sup> It must therefore be hoped that the negotiations on agricultural protectionism conducted in the context of the Uruguay Round will prove successful.<sup>72</sup>

<sup>68</sup> See "Council Regulation (EEC) No. 1096/88 of 25 April 1988 establishing a Community scheme to encourage the cessation of farming," *Official Journal of the European Communities*, L 110 (April 29, 1988), Luxembourg, pp. 1–6.

<sup>69</sup> See "Council Regulation (EEC) No. 1094/88 of 25 April 1988," *Official Journal of the European Communities*, L 106 (April 27, 1988), Luxembourg, pp. 28–32.

<sup>70</sup> See Commission of the European Communities (1988d).

<sup>71</sup> For a recent statement of this position, see Commission of the European Communities (1988c, p. 8).

<sup>72</sup> The Community's position regarding the agricultural negotiations in the Uruguay Round were stated in Commission of the European Communities (1987f).

# Appendix I

## Statistical Tables

**Table 4. Monetary Gaps<sup>1</sup>**

(In percent of common price)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988 <sup>2</sup>
Belgium/Luxembourg Netherlands <sup>3</sup>	4.0	2.7	2.7	2.0	1.4	1.4	3.3	1.9	1.7	4.3	5.4	6.2	3.1	2.4	2.4	1.0	—
Denmark <sup>4</sup>	—	—	—	—	—	—	—	—	—	—	—	1.0	—	—	—	—	—
France	—	—	-7.2	—	-17.5	-19.4	-10.6	—	—	—	-5.3	-4.4	-2.0	—	-4.8	-3.5	-3.5
Germany, Fed. Rep. of	5.7	12.0	12.0	10.0	9.3	9.3	10.8	10.8	8.8	8.3	8.4	10.3	7.4	2.4	2.4	1.0	—
Greece <sup>5</sup>	—	—	—	—	—	—	—	—	—	—	—	-3.0	-3.6	-32.6	-37.6	-35.6	-37.6
Italy	—	-11.6	-4.1	—	-19.2	-22.5	-16.4	-7.8	-1.0	-4.4	-2.3	—	—	-4.6	-1.7	-5.3	-6.5
Ireland <sup>4,6</sup>	—	-13.8	-10.5	-7.2	-23.5	-4.1	-2.0	—	—	—	—	—	—	—	-5.8	-3.6	-3.6
United Kingdom <sup>4</sup>	—	-13.8	-13.8	-13.1	-38.5	-31.6	-27.0	-9.0	12.1	8.0	3.1	7.6	-1.9	-1.8	-25.4	-17.5	-12.7
Portugal <sup>7</sup>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spain <sup>7</sup>	—	—	—	—	—	—	—	—	—	—	—	—	—	—	-4.9	—	—

Sources: Commission des Communautés Européennes, *Agri-Monétaire: Evolution des Ecart*s, various issues, and *Official Journal*, various issues.

<sup>1</sup> Applied monetary gaps at end of year. Minus sign denotes a negative monetary gap, i.e., a price in national currency that is below the common price. Data afford no indications regarding changes in monetary gaps that may have occurred in the course of a year on account of adjustments in green rates, EMS realignment, and, for countries that do not participate in the EMS exchange rate mechanism and Italy, fluctuations in the exchange rate. Applied monetary gaps (i.e., monetary gaps minus neutral margin) may vary among products because of ad hoc decisions or because of phasing of the entry into force of changes in green rates is linked to dates in the marketing year or the products concerned. For the sake of comparability, data shown here always apply to cereals.

<sup>2</sup> Early July, 1988.

<sup>3</sup> Following the EMS realignment of October 5, 1981, MCAs emerged between the Netherlands, on the one hand, and Belgium and Luxembourg, on the other.

<sup>4</sup> Joined the Community in 1973.

<sup>5</sup> Joined the Community in 1981.

<sup>6</sup> As of October 7, 1974, Ireland ceased to peg its green rate to the green rate of the United Kingdom, without ending the pegging of the Irish pound to sterling. The Irish authorities wanted to have more leeway to "devalue" the green rate, i.e., to raise prices expressed in domestic currency.

<sup>7</sup> Joined the Community in 1986.



**Table 5. EC: Coefficients of Nominal Protection for Selected Agricultural Products<sup>1</sup>**

	1970	1975	1980	1985	Average
Beef	123 (27)	121 (26)	95 (8)	100 (7)	111 <sup>2</sup> (16) <sup>3</sup>
Sugar	204 (19)	81 (12)	82 (7)	391 (126)	180 <sup>2</sup> (84) <sup>3</sup>
Butter	225 (44)	169 (26)	130 (7)	124 (13)	172 <sup>4</sup> (36) <sup>3</sup>
Maize	151 (14)	124 (14)	144 (16)	149 (19)	155 <sup>5</sup> (22) <sup>3</sup>
Wheat	151 (20)	80 (7)	115 (11)	137 (20)	126 <sup>4</sup> (28) <sup>3</sup>

Sources: Statistical Office of the European Communities, *Eurostat*, *Agricultural Prices*, and IMF, *International Financial Statistics*, various issues.

<sup>1</sup> Coefficients of nominal protection are defined as the ratio of domestic to world market prices expressed in percent. Coefficients were calculated for individual EC member countries and averaged for the EC. Standard deviation of the coefficients of protection across countries and over time are given in parentheses.

<sup>2</sup> 1969–85.

<sup>3</sup> Standard deviation of the average coefficients of protection during the observation period.

<sup>4</sup> 1961–85.

<sup>5</sup> 1963–85.

**Table 6. OECD: Producer Subsidy Equivalents (PSEs) by Commodity and Country<sup>1</sup>**

(In percent)

	United States		Canada		European Community		Japan		Australia/ New Zealand <sup>2</sup>		Total OECD <sup>3</sup>	
	1979–81	1984–86	1979–81	1984–86	1979–81	1984–86	1979–81	1984–86	1979–81	1984–86	1979–81	1984–86
Eggs	5	7	26	5	20	18	20	19	27	25	16	14
Milk	55	66	74	97	67	56	79	82	27	33	63	63
Wheat	14	44	15	41	28	36	97	98	4	13	21	41
Coarse grains	9	30	15	42	24	26	96	98	8	8	15	30
Beef and veal	9	9	11	16	42	53	53	55	10	11	25	30
Pigmeat	5	6	8	5	7	6	22	40	19	9	9	11
Poultry	5	10	29	17	24	27	19	16	24	12	16	16
Sugar	15	76	15	37	34	75	46	72	–1.4 <sup>4</sup>	21 <sup>4</sup>	28	71
Rice	7	61	...	...	15	68	71	86	16 <sup>4</sup>	25 <sup>4</sup>	63	84
Sheepmeat	7	8	...	...	55	63	...	...	13	37	40	53
Wool	41	69	...	...	...	...	...	...	12	9	11	12
Soybeans	6	10	...	...	43	59	82	84	...	...	8	13
Other oilseeds	...	...	15	30	40	36	...	...	4 <sup>4</sup>	9 <sup>4</sup>	28	24
Crops	10	31	15	40	27	38	71	86	6	12	25	44
Livestock products	21	26	31	39	41	41	40	46	15	19	32	35
Average, all above commodities	16	28	24	39	37	40	57	69	14	19	29	38

Source: Organization for Economic Cooperation and Development (1988).

<sup>1</sup> A PSE attempts to measure the payment or subsidy needed to compensate producers for the removal of agricultural producer support policies (expressed here in percent of the value of output) plus direct payments minus any producer levies or taxes.

<sup>2</sup> Arithmetic average.

<sup>3</sup> Includes all OECD countries.

<sup>4</sup> Australia only.

**Table 7. EC: Development of Agricultural Producer Prices (in real terms)<sup>1</sup>**

(1980 = 100)

	1975	1978	1979	1981	1982	1983	1984	1985	1986
Belgium	101.7	107.5	103.2	101.8	106.3	108.1	102.8	101.4	104.1
Denmark	112.3	114.7	106.1	96.6	97.7	97.8	93.8	89.0	91.4
France	100.4	109.4	102.3	100.8	102.9	99.7	90.8	88.7	...
Germany, Fed. Rep. of	113.1	109.0	105.4	98.5	96.0	93.8	89.9	84.6	83.3
Greece	98.4	108.1	105.0	98.7	104.1	102.2	101.3	99.3	97.5
Ireland	108.7	119.8	112.8	100.3	97.9	97.8	93.4	88.1	88.7
Italy	109.3	112.2	106.2	97.2	98.7	98.0	95.1	94.1	97.9
Luxembourg	...	...	...	97.4	95.2	98.8	91.8	92.1	94.1
Netherlands	115.7	105.8	104.5	99.5	96.6	96.8	94.6	91.5	...
United Kingdom	123.1	115.3	111.9	101.2	101.4	101.2	95.4	88.9	86.5
Average	109.2	111.3	106.4	99.2	99.7	99.4	94.9	91.7	92.9

Sources: Commission of the European Communities (1987a), and IMF, *International Financial Statistics*, various issues.<sup>1</sup> Agricultural producer prices deflated by wholesale prices or prices for industrial products.**Table 8. EC: Ratio of Producer Prices to Input Prices<sup>1</sup>**

(1979–81 = 100)

	1977	1982	1983	1984	1985	1986	1987
Belgium	103.2	96.9	99.2	94.1	94.8	95.4	96.7
Denmark	101.4	95.8	94.2	91.3	92.1	95.3	95.7
Germany, Fed. Rep. of	107.1	96.5	92.1	91.2	91.4	92.6	94.8
Greece	108.1	104.2	99.2	102.4	103.5	100.1	101.6
France	110.5	96.5	94.9	90.6	89.9	93.6	91.8
Ireland	104.5	94.6	95.8	91.3	87.2	92.7	100.4
Italy	100.6	95.4	94.8	92.7	95.9	100.9	101.7
Luxembourg	100.7	100.7	98.0	94.0	102.2	103.0	108.2
Netherlands	108.2	98.8	96.6	96.6	99.1	100.9	107.6
United Kingdom	107.5	98.3	96.5	94.0	91.8	95.6	95.9
EC-10	106.3	97.3	95.4	93.4	93.8	96.9	98.2

Source: Statistical Office of the European Communities (1988).

<sup>1</sup> The "cost-price squeeze" is calculated by dividing changes in the index of prices of the value of final agricultural production by changes in the index of prices of the value of inputs.**Table 9. EC: Self-Sufficiency in Cereal Production**

(In percent)

	1960–64	1965–69	1970–74	1975–79	1980–84	1985
Belgium	53.8	48.8	41.6	41.2	52.0	60.6
Denmark	...	...	97.7	108.2	106.9	133.5
France	117.0	135.2	158.8	157.0	175.4	215.3
Germany, Fed. Rep. of	76.6	76.0	78.0	82.9	90.3	99.5
Greece	...	...	...	92.0	105.0	110.3
Ireland	...	...	70.8	76.6	83.8	101.8
Italy	76.1	69.6	67.8	69.0	77.1	81.6
Netherlands	34.1	37.3	31.3	26.1	28.0	31.0
United Kingdom	...	...	65.3	70.1	100.1	138.7
EC Total	84.0	88.0	89.7	91.2	106.3	127.1

Source: Statistical Office of the European Communities, *Yearbook of Agricultural Statistics*, various issues.**Table 10. EC: Self-Sufficiency in White Sugar Production**

(In percent)

	1960–64	1965–69	1970–74	1975–79	1980–84	1985
Belgium	117.0	133.4	184.2	194.1	257.5	231.0
Denmark	...	...	121.1	180.4	200.8	238.9
France	118.1	118.7	153.9	182.1	224.6	211.4
Germany, Fed. Rep. of	89.9	86.8	95.5	116.0	133.4	131.9
Greece	...	...	...	94.0	100.7	84.8
Ireland	...	...	107.7	114.3	123.5	141.4
Italy	88.7	90.2	72.5	83.0	98.0	77.3
Netherlands	97.7	100.5	112.2	144.0	164.8	164.3
United Kingdom	...	...	34.8	32.2	51.9	63.7
EC Total	99.3	99.9	91.5	108.5	134.4	131.7

Source: Statistical Office of the European Communities, *Yearbook of Agricultural Statistics*, various issues.

**Table 11. EC: Self-Sufficiency in Butter Production**

(In percent)

	1963-64	1965-69	1970-74	1975-79	1980-84	1985
Belgium	96.8	103.7	104.9	106.1	116.0	...
Denmark	...	...	327.8	297.8	217.2	198.0
France	108.8	115.6	113.2	111.2	122.5	127.9
Germany, Fed. Rep. of	94.3	101.8	105.6	132.3	134.8	111.9
Greece	...	...	...	65.5	58.1	...
Ireland	...	...	202.2	285.4	319.3	...
Italy	63.2	68.4	65.3	62.3	64.5	...
Netherlands	140.1	238.7	361.7	443.8	419.2	...
United Kingdom	...	...	18.3	29.2	62.8	73.1
EC Total	99.6	109.2	101.5	110.5	128.4	112.6

Source: Statistical Office of the European Communities, *Yearbook of Agricultural Statistics*, various issues.

**Table 12. EC: Self-Sufficiency in Wine Production<sup>1</sup>**

(In percent)

	1960-64	1965-69	1970-74	1975-79	1980-84	1985
Belgium	0.5	0.6	0.6	0.2	0.2	0.1
Denmark	—	—	—	—	—	—
France	88.8	94.4	97.3	97.1	102.6	101.8
Germany, Fed. Rep. of	59.5	56.8	62.7	56.8	59.5	55.5
Greece	...	...	...	129.4	109.2	115.9
Ireland	—	—	—	—	—	—
Italy	103.0	106.1	114.0	123.1	121.6	186.0
Netherlands	2.2	1.9	1.0	—	—	—
United Kingdom	...	...	—	0.1	0.1	0.2
EC Total	94.2	95.9	97.8	98.6	99.5	112.3

Source: Statistical Office of the European Communities, *Yearbook of Agricultural Statistics*, various issues.

<sup>1</sup> No account is taken of the very large volume of wine distilled into alcohol for human consumption or industrial use.

**Table 13. EC: Self-Sufficiency in Vegetables and Fruit Production**

(In percent)

	1960-64	1965-69	1970-74	1975-79	1980-84	1985
Belgium	94.5	95.8	96.9	93.8	93.0	93.8
Denmark	...	...	60.9	65.8	59.6	59.3
France	98.8	96.8	97.0	92.0	93.8	92.4
Germany, Fed. Rep. of	60.9	55.7	47.9	40.9	44.9	47.3
Greece	...	...	...	122.1	136.3	143.0
Ireland	...	...	85.5	84.2	68.7	65.7
Italy	120.1	115.4	114.6	119.6	124.8	124.3
Netherlands	149.8	144.0	139.2	129.3	135.2	143.5
United Kingdom	...	...	62.6	61.5	55.8	49.7
EC Total	99.6	96.6	91.6	88.7	93.9	94.1

Source: Statistical Office of the European Communities, *Yearbook of Agricultural Statistics*, various issues.

**Table 14. EC: Self-Sufficiency in Meat Production**

(In percent)

	1960-64	1965-69	1970-74	1975-79	1980-84	1985
Belgium	97.6	101.3	119.5	116.7	127.0	130.3
Denmark	...	...	322.6	298.6	332.1	322.5
France	101.7	97.0	95.4	96.0	100.7	98.5
Germany, Fed. Rep. of	91.1	88.5	86.2	87.7	90.7	90.7
Greece	...	...	...	78.6	77.1	71.3
Ireland	...	...	172.2	195.7	183.7	198.9
Italy	88.0	80.6	78.9	82.7	83.5	80.6
Netherlands	135.2	146.8	167.1	162.8	174.7	183.9
United Kingdom	...	...	69.7	73.4	78.3	81.6
EC Total	97.5	94.3	94.8	97.2	101.6	102.1

Source: Statistical Office of the European Communities, *Yearbook of Agricultural Statistics*, various issues.

**Table 15. EC: Self-Sufficiency in Pork Production**

(In percent)

	1960-64	1965-69	1970-74	1975-79	1980-84	1985
Belgium	103.1	114.5	144.8	150.0	161.5	161.7
Denmark	...	...	416.0	346.4	392.8	367.9
France	99.3	91.5	88.9	89.2	87.0	84.5
Germany, Fed. Rep. of	96.9	96.0	91.5	90.0	88.7	88.2
Greece	...	...	...	87.9	79.7	69.7
Ireland	...	...	158.9	135.0	139.6	118.3
Italy	93.4	91.7	81.4	78.2	77.8	74.1
Netherlands	146.0	159.1	179.7	174.8	177.1	188.1
United Kingdom	...	...	64.3	63.4	67.2	70.1
EC Total	101.0	99.7	100.9	100.2	101.9	102.5

Source: Statistical Office of the European Communities, *Yearbook of Agricultural Statistics*, various issues.

**Table 16. EC: Self-Sufficiency in Wheat Production**

(In percent)

	1960-64	1965-69	1970-74	1975-79	1980-84
Belgium	71.8	71.7	52.7	64.0	69.5
Denmark	...	...	121.0	139.2	126.0
France	118.1	142.6	163.2	188.6	206.0
Germany, Fed. Rep. of	75.9	83.5	83.7	97.6	104.3
Greece	...	...	...	139.4	144.1
Ireland	...	...	66.2	53.0	50.1
Italy	90.5	96.6	89.8	83.6	84.6
Netherlands	39.7	61.9	46.5	58.0	58.1
United Kingdom	...	...	53.4	62.9	95.9
EC Total	93.6	107.2	97.1	106.4	121.6

Source: Statistical Office of the European Communities, *Yearbook of Agricultural Statistics*, various issues.

**Table 17. EC: Self-Sufficiency in Beef Production**

(In percent)

	1960-64	1965-69	1970-74	1975-79	1980-84	1985
Belgium	95.0	91.5	96.5	97.2	113.1	120.2
Denmark	...	...	231.8	291.8	368.1	327.8
France	106.3	105.3	105.0	106.5	106.0	109.2
Germany, Fed. Rep. of	95.6	88.0	89.3	96.7	109.7	111.6
Greece	...	...	...	50.7	44.9	36.8
Ireland	...	...	216.3	296.6	253.8	323.0
Italy	77.8	64.1	67.1	71.7	73.6	71.5
Netherlands	111.9	111.7	118.3	124.9	159.3	185.8
United Kingdom	...	...	73.3	76.8	87.0	91.6
EC Total	97.2	90.2	92.5	98.5	104.7	108.0

Source: Statistical Office of the European Communities, *Yearbook of Agricultural Statistics*, various issues.**Table 18. EC: Self-Sufficiency in Egg Production**

(In percent)

	1960-64	1965-69	1970-74	1975-79	1980-84	1985
Belgium	120.8	124.9	176.6	162.7	126.9	112.8
Denmark	...	...	122.9	106.1	102.8	97.6
France	98.7	100.2	100.2	100.1	102.5	98.4
Germany, Fed. Rep. of	65.4	84.3	84.1	77.5	71.9	72.5
Greece	...	...	...	100.6	98.4	97.6
Ireland	...	...	98.7	94.1	74.1	78.7
Italy	83.3	93.8	96.5	96.4	93.4	92.1
Netherlands	217.9	141.3	149.5	211.4	304.8	...
United Kingdom	...	...	97.3	99.6	97.6	95.3
EC Total	93.1	97.2	99.8	100.3	102.4	89.9

Source: Statistical Office of the European Communities, *Yearbook of Agricultural Statistics*, various issues.**Table 19. World Production and the EC's Share in Trade of Selected Agricultural Products (1983-85)<sup>1</sup>**

	World Production (1000 t) <sup>2</sup>	World Trade <sup>3</sup> (1000 t) <sup>2</sup>	Proportion of Production Traded (in percent)	Percent of World Trade		
				Imported by EC	Exported by EC	Net EC share of world trade <sup>4</sup>
Total cereals (except rice) <sup>5</sup>	1,300,107	195,741	15.1	7.7	10.9	3.2
Of which: total wheat	509,469	102,306	20.1	3.4	16.7	13.3
Feed grain (except rice) <sup>5</sup>	790,638	93,435	11.8	12.2	5.6	-6.6
Of which: maize	430,109	63,012	14.7	16.1	0.4	-15.7
Oilseeds (by weight produced)	211,040	31,350	14.9	48.1	0.2	-47.9
Of which: soya	90,170	25,866	28.7	51.4	0.0	-51.4
Wine	32,748	2,426	7.4	8.9	67.3	58.4
Sugar	113,181	27,767	24.5	6.7	15.5	8.8
Total milk	454,486	273	0.1	1.8	62.3	60.5
Butter	7,657	773	10.1	13.1	44.2	31.1
Cheese	12,471	834	6.7	13.4	49.3	35.9
Milk powder (skimmed and whole)	6,608	1,738	26.3	1.2	40.0	38.8
Total meat (except offal)	144,193 <sup>6</sup>	5,470 <sup>7</sup>	3.8	13.9	19.7	5.8
Of which: beef and veal	46,473 <sup>6</sup>	2,285 <sup>7</sup>	4.9	9.7	23.5	13.8
pigmeat	55,947 <sup>6</sup>	851 <sup>7</sup>	1.5	11.3	17.0	5.7
poultrymeat	29,922 <sup>6</sup>	1,277 <sup>7</sup>	4.3	5.7	29.4	23.7
Eggs	29,952	433	1.4	4.8	32.8	28.0

Source: Commission of the European Communities (1988a).

<sup>1</sup> Community of 12.<sup>2</sup> Metric tons.<sup>3</sup> Exports (excluding intra-EC trade) and excluding processed products.<sup>4</sup> Net balance EC trade/world trade.<sup>5</sup> Cereals as grain; processed products excluded.<sup>6</sup> Including salted meat.<sup>7</sup> Excluding salted meat for trade.

**Table 20. OECD: Share of Each Country in OECD Agricultural Exports**

(Percent of agricultural exports in U.S. dollars)

	1964-70	1971-75	1976-80	1981-85	1981	1982	1983	1984	1985
Belgium <sup>1</sup>	3.0	4.2	4.6	4.5	4.4	4.6	4.4	4.4	4.6
Denmark	5.8	4.5	4.4	4.1	3.9	4.1	4.1	4.1	4.3
France	10.3	13.0	12.8	12.8	12.8	12.3	12.7	12.5	13.6
Germany, Fed. Rep. of	3.1	5.3	7.0	7.5	7.3	7.6	7.5	7.3	7.8
Greece	1.3	1.0	1.1	1.0	0.8	1.0	1.1	1.1	1.1
Ireland	2.2	2.1	2.4	2.1	2.0	2.0	2.1	2.1	2.4
Italy	4.7	4.4	4.4	4.4	4.2	4.5	4.2	4.2	5.1
Netherlands	9.8	11.1	11.8	11.0	10.6	11.2	11.2	10.7	11.2
United Kingdom	5.0	4.8	5.6	5.7	5.5	5.8	5.6	5.4	5.9
EC-10	45.2	50.3	54.1	53.1	51.6	53.2	52.8	51.8	55.9
Portugal	0.8	0.6	0.4	0.4	0.3	0.3	0.4	0.4	0.4
Spain	2.8	2.7	2.7	2.6	2.7	2.5	2.4	2.8	2.9
United States	25.0	23.6	23.5	23.1	25.6	22.6	23.6	23.5	20.1
Japan	2.3	1.8	1.2	1.2	1.3	1.2	1.2	1.2	1.2
Canada	8.6	6.9	5.6	6.8	6.1	7.0	7.4	7.2	6.4
Australia	6.5	6.4	5.5	4.9	5.1	5.3	4.1	5.4	4.8
New Zealand	3.2	2.5	1.9	2.3	2.1	2.3	2.3	2.2	2.5
OECD	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: OECD, *Foreign Trade Statistics*, Series C, various issues.<sup>1</sup> Including Luxembourg.**Table 21. OECD: Share of Each Country in OECD Agricultural Imports**

(Percent of agricultural imports in U.S. dollars)

	1964-70	1971-75	1976-80	1981-85	1981	1982	1983	1984	1985
Belgium <sup>1</sup>	3.8	4.6	5.3	4.9	5.2	5.3	4.8	4.7	4.5
Denmark	1.4	1.2	1.5	1.5	1.6	1.4	1.5	1.5	1.5
France	7.8	7.7	9.4	9.0	9.1	9.2	9.3	8.6	8.7
Germany, Fed. Rep. of	14.9	15.2	15.3	13.8	14.3	14.2	14.1	13.3	13.3
Greece	0.6	0.7	0.6	0.9	0.7	1.0	1.0	1.0	1.0
Ireland	0.7	0.7	0.8	1.0	1.1	1.0	1.0	0.9	0.9
Italy	7.2	9.2	8.5	8.5	8.1	8.9	8.6	7.9	9.1
Netherlands	4.7	5.8	6.9	6.6	6.8	6.8	6.8	6.3	6.4
United Kingdom	18.8	13.8	11.2	10.1	10.5	10.4	10.0	9.8	9.5
EC-10	60.0	58.7	59.6	56.3	57.4	58.2	57.0	54.1	54.9
Portugal	0.5	0.9	0.8	0.8	1.1	0.9	0.7	0.8	0.7
Spain	2.0	2.4	2.3	2.2	2.2	2.4	2.4	2.1	2.1
United States	18.9	16.4	15.4	17.5	15.9	15.9	17.1	19.2	19.5
Japan	7.1	10.3	11.3	12.5	12.7	12.0	12.5	13.1	12.4
Canada	3.2	3.5	3.2	3.4	3.4	3.2	3.4	3.7	3.4
Australia	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.9
New Zealand	0.3	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.3
OECD	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: OECD, *Foreign Trade Statistics*, Series C, various issues.<sup>1</sup> Including Luxembourg.



**Table 22. OECD: Share of Agricultural Imports in Total Imports<sup>1</sup>**

(Percent of merchandise imports in U.S. dollars)

	1964–70	1971–75	1976–80	1981–85	1981	1982	1983	1984	1985
Belgium <sup>2</sup>	12.4	11.6	11.3	10.6	10.6	11.1	10.7	10.7	10.1
Denmark	11.1	9.3	10.4	10.7	11.1	10.5	11.0	10.8	10.0
France	15.1	11.4	11.2	10.0	9.5	9.7	10.5	10.1	10.1
Germany, Fed. Rep. of	19.3	15.4	12.8	10.9	11.0	11.2	11.0	10.7	10.6
Greece	12.8	10.6	8.3	12.0	10.7	12.1	12.5	12.3	12.3
Ireland	16.2	12.6	12.0	12.1	12.6	12.2	12.5	11.4	11.7
Italy	19.0	18.3	14.7	12.5	11.5	12.9	13.1	11.8	13.0
Netherlands	13.3	13.1	13.3	12.8	12.9	13.3	13.1	12.4	12.2
United Kingdom	26.9	19.5	14.6	12.0	13.0	12.8	12.0	11.4	11.0
EC-10	18.5	14.9	12.8	11.3	11.3	11.6	11.6	11.1	11.1
Portugal	12.6	15.4	14.2	11.7	13.9	11.3	10.7	11.5	11.0
Spain	14.7	12.9	11.0	9.1	8.7	9.4	9.7	9.1	8.8
United States	17.5	12.3	9.1	7.3	7.4	7.7	7.6	6.9	6.8
Japan	15.8	14.8	13.4	11.7	11.3	11.2	11.9	11.9	12.2
Canada	8.2	7.7	7.3	6.4	6.6	7.3	6.6	6.1	5.6
Australia	5.0	5.0	5.1	4.6	4.1	4.1	5.1	4.9	4.8
New Zealand	6.9	6.6	5.9	5.8	5.3	6.2	5.6	5.8	5.9
OECD	16.2	13.1	11.1	9.5	9.6	9.9	9.8	9.3	9.1

Source: OECD, *Foreign Trade Statistics*, Series B, various issues.<sup>1</sup> Agricultural imports are Standard International Trade Classification categories 0 and 1 (food, beverages, and tobacco).<sup>2</sup> Including Luxembourg.**Table 23. OECD: Share of Agricultural Exports in Total Exports<sup>1</sup>**

(Percent of merchandise exports in U.S. dollars)

	1964–70	1971–75	1976–80	1981–85	1981	1982	1983	1984	1985
Belgium <sup>2</sup>	7.3	9.0	9.0	10.0	10.3	10.5	9.6	10.1	9.5
Denmark	43.0	34.3	32.9	30.5	31.9	32.5	29.9	29.6	28.5
France	16.1	16.9	14.8	15.8	16.4	15.9	15.8	15.6	15.3
Germany, Fed. Rep. of	2.5	3.7	4.4	5.0	5.4	5.2	5.0	4.9	4.7
Greece	54.2	34.2	29.4	26.6	25.7	27.4	27.4	26.6	25.9
Ireland	55.4	44.3	39.0	28.3	33.1	30.0	27.8	25.5	25.1
Italy	10.0	8.2	7.1	6.9	7.2	7.2	6.5	6.5	7.1
Netherlands	23.7	21.0	20.1	19.3	20.0	20.1	19.5	18.7	18.0
United Kingdom	6.4	6.8	6.9	6.9	7.2	7.1	7.0	6.7	6.4
EC-10	11.0	10.8	10.4	10.6	11.1	10.8	10.5	10.4	10.0
Portugal	22.3	16.5	13.9	9.3	10.4	9.7	9.6	8.8	7.8
Spain	37.9	23.3	18.1	14.5	16.9	14.7	14.1	13.7	12.9
United States	14.8	15.0	14.4	13.0	14.7	13.0	13.8	12.9	10.7
Japan	3.8	2.1	1.2	0.9	1.1	1.0	0.9	0.8	0.7
Canada	15.4	12.1	10.5	10.7	11.6	12.4	11.7	9.8	8.3
Australia	36.3	34.7	31.6	27.3	30.2	29.9	24.4	27.8	24.1
New Zealand	56.4	54.8	46.7	50.4	50.2	53.2	50.9	47.0	50.5
OECD	12.4	11.3	10.3	9.9	10.7	10.3	10.0	9.6	8.8

Source: OECD, *Foreign Trade Statistics*, Series B, various issues.<sup>1</sup> Agricultural exports are Standard International Trade Classification categories 0 and 1 (food, beverages, and tobacco).<sup>2</sup> Including Luxembourg.

**Table 24. EC: Ratio of Stocks to Production for Selected Commodities and Countries**

(Percent of midyear stocks in the volume of annual output)

	1973-75	1976-80	1981	1982	1983	1984	1985
<b>Cereals<sup>1</sup></b>							
United States	69.6	78.8	73.0	85.6	125.8	71.9	...
EC-9 <sup>2</sup>	14.5	13.7	11.9	12.4	13.3	...	...
Australia	10.2	15.1	15.8	29.5	16.4	28.1	...
<b>Butter</b>							
United States	12.8	21.3	41.3	43.2	45.5	46.8	23.0
EC-9	11.4	14.9	9.9	10.7	24.7	42.3	51.9
Australia	10.7	13.9	14.5	17.0	21.6	28.1	27.6
New Zealand	10.7	10.8	8.1	10.6	7.1	27.1	...
<b>Skimmed milk powder</b>							
United States	22.7	55.1	53.7	78.2	90.1	118.6	75.3
EC-9	19.9	34.4	12.2	19.0	31.2	38.0	29.2
Australia	12.6	11.8	15.4	7.8	10.6	13.6	9.3
New Zealand	45.9	55.2	35.7	60.3	31.0	31.0	...
<b>Beef and veal</b>							
EC-9	2.4	4.3	2.6	3.1	5.4	8.2	8.7
Australia	7.2	5.5	4.7	2.9	3.0	2.9	3.4

Source: Organization for Economic Cooperation and Development.

Note: EC intervention (EAGGF) stocks are included in all EC totals.

<sup>1</sup> Cereals excluding rice.<sup>2</sup> Excluding Ireland.**Table 25. OECD: Share of Agricultural Value Added in GDP<sup>1</sup>**

(Percent of nominal value added)

	1960-70	1971-75	1976-80	1981-85 <sup>2</sup>	1981	1982	1983	1984	1985
Belgium	5.2	3.5	2.5	2.5	2.4	2.5	2.6	2.5	2.4
Denmark	9.3	5.6	5.0	5.2	5.1	5.7	4.9	5.6	4.8
France	8.2	6.0	4.6	3.9	3.9	4.3	4.0	3.9	3.7
Germany, Fed. Rep. of	4.6	2.9	2.4	2.0	2.1	2.3	1.9	2.0	1.7
Greece	19.7	16.9	15.2	15.8	16.1	16.6	15.2	15.7	15.5
Ireland	18.3	15.0	14.4	10.4	10.1	10.4	10.7	11.0	9.6
Italy	10.8	7.5	6.9	5.6	6.0	5.8	6.0	5.4	5.0
Luxembourg	5.6	3.6	2.9	2.9	2.7	3.4	2.9	2.7	...
Netherlands	6.8	4.8	3.9	4.3	4.1	4.3	4.3	4.4	...
United Kingdom	2.9	2.5	2.1	1.8	1.9	2.0	1.8	1.9	1.6
EC-10	6.5	4.3	4.1	3.6	3.7	3.8	3.6	3.6	3.3
Portugal	19.4	14.4	11.7	8.7	8.5	8.8	8.5	9.1	...
Spain	15.7	10.1	8.1	6.2	6.1	6.3	6.2	6.5	6.2
United States	3.2	3.3	2.9	2.4	2.3	2.6	2.0	2.3	2.1
Japan	9.3	5.6	4.6	3.3	3.5	3.4	3.3	3.2	3.1
Canada	4.9	4.2	3.9	3.5	3.8	3.7	3.3	3.2	...
Australia	9.4	6.6	5.7	4.6	5.1	3.8	5.0	4.5	...
New Zealand	...	11.2	10.7	9.4	9.6	8.2	8.7	11.1	...
OECD <sup>3</sup>	6.1	5.0	4.3	3.6	3.8	3.7	3.4	3.5	3.3

Source: OECD, *National Accounts*, various issues.<sup>1</sup> Agriculture includes hunting, forestry, and fishing.<sup>2</sup> 1981-84 for Canada, Luxembourg, Netherlands, Portugal, Australia, and New Zealand.<sup>3</sup> Excluding Iceland and Switzerland. Aggregates were calculated using purchasing power parities for GDP of the current year. OECD estimates for 1985 for Canada, Luxembourg, Netherlands, Portugal, Australia, and New Zealand are included in the OECD total.

**Table 26. OECD: Growth of Agricultural Employment<sup>1</sup>**

(Average annual percentage change)

	1960–70	1970–75	1975–80	1980–85	1981	1982	1983	1984	1985
Belgium	–5.0	–4.8	–3.8	–1.3	–2.7	–1.8	–0.9	—	–0.9
Denmark	–3.1	–3.0	–5.2	–0.7	–0.6	1.7	—	–6.8	2.4
France	–4.1	–4.8	–3.0	–3.1	–3.4	–3.3	–3.2	–3.0	–2.7
Germany, Fed. Rep. of	–4.6	–4.8	–4.1	–0.7	–2.0	–0.9	–0.3	–0.1	–0.1
Greece	–4.1	–2.5	–2.1	0.4	6.6	–6.9	5.2	–1.5	–0.7
Ireland	–3.2	–3.4	–2.6	–4.2	–6.2	–1.5	–2.1	–4.2	–6.6
Italy	–5.2	–3.4	–2.3	–4.6	–5.8	–7.7	0.2	–4.0	–5.4
Luxembourg	–5.0	–4.1	–4.3	–4.4	–7.1	–3.8	–2.6	–4.1	–4.2
Netherlands	–3.4	–1.9	–1.3	0.2	–0.8	–1.2	2.5	–0.8	1.2
United Kingdom	–3.4	–3.0	–0.9	–0.5	–0.3	—	–1.2	–0.8	–0.3
EC-10	–4.5	–3.8	–2.7	–2.4	–2.5	–4.3	–0.1	–2.4	–2.4
Portugal	–3.6	4.7	–3.2	–2.8	–5.3	–2.6	–1.1	1.8	–6.5
Spain	–2.8	–3.7	–5.0	–2.5	–2.7	0.6	–1.8	–3.6	–5.1
United States	–4.4	–0.3	0.1	–1.1	–0.3	1.4	–0.8	–2.0	–3.8
Japan	–4.1	–5.7	–2.7	–2.5	–3.5	–1.6	–3.1	–3.6	–0.6
Canada	–2.7	–1.3	0.6	0.2	2.4	–6.5	5.2	–0.2	0.7
Australia	–0.5	–1.3	0.1	0.2	1.7	–0.7	1.0	–3.1	2.2
New Zealand	0.3	—	1.2	1.4	3.6	2.1	–2.7	0.7	3.5
OECD <sup>2</sup>	–3.4	–2.7	–1.7	–1.6	–1.7	–1.4	–0.9	–1.9	–1.9

Source: OECD, *Labour Force Statistics*, various issues.

<sup>1</sup> Agriculture includes hunting, forestry, and fishing. According to International Labor Organization guidelines, unpaid family workers are included in employment irrespective of the number of hours worked during the specified period. Some of the above countries may exclude such workers, however, if they worked less than a number of specified hours per week.

<sup>2</sup> OECD estimates for 1985 for Iceland are included in the OECD total.

**Table 27. OECD: Share of Agriculture in Civilian Employment<sup>1</sup>**

(Percentages)

	1960–70	1971–75	1976–80	1980–81	1981	1982	1983	1984	1985
Belgium	6.6	3.9	3.2	3.0	3.0	3.0	3.0	3.0	2.9
Denmark	14.8	9.9	7.7	7.1	7.3	7.5	7.4	6.7	6.7
France	18.0	11.4	9.2	8.0	8.4	8.2	7.9	7.8	7.6
Germany, Fed. Rep. of	11.2	7.4	6.1	5.6	5.5	5.5	5.6	5.6	5.5
Greece	49.4	37.0	32.1	29.6	30.7	28.9	29.9	29.4	28.9
Ireland	32.3	24.2	20.4	16.8	17.3	17.0	17.1	16.6	16.0
Italy	26.0	18.4	15.4	12.3	13.4	12.4	12.4	11.9	11.2
Luxembourg	12.6	7.9	6.1	4.7	5.0	4.8	4.7	4.5	4.2
Netherlands	7.8	5.8	5.3	4.9	4.9	4.8	5.0	5.0	4.9
United Kingdom	3.9	2.9	2.7	2.7	2.7	2.7	2.7	2.7	2.6
EC-10	14.8	10.1	8.5	7.5	7.8	7.6	7.6	7.4	7.2
Portugal	37.3	30.7	31.2	24.5	26.0	25.2	23.6	24.5	23.2
Spain	32.0	24.3	20.1	18.4	18.6	18.8	18.6	18.6	17.6
United States	6.3	4.2	3.7	3.4	3.5	3.6	3.5	3.3	3.1
Japan	23.7	13.9	11.5	9.3	10.0	9.7	9.3	8.9	8.8
Canada	10.3	6.7	5.7	5.3	5.4	5.2	5.5	5.3	5.2
Australia	9.6	7.3	6.5	6.4	6.5	6.4	6.6	6.2	6.2
New Zealand	13.0	11.2	10.9	11.3	11.4	11.4	11.2	11.2	11.1
OECD <sup>2</sup>	17.5	12.3	10.6	9.4	9.7	9.6	9.5	9.2	8.9

Source: OECD, *Labour Force Statistics*, various issues.

<sup>1</sup> Agriculture includes hunting, forestry, and fishing. According to International Labor Organization guidelines, unpaid family workers are included in employment irrespective of the number of hours worked during the specified period. Some of the above countries may exclude such workers, however, if they worked less than a number of specified hours per week.

<sup>2</sup> OECD estimates for 1985 for Iceland are included in the OECD total.

**Table 28. EC-10: Holdings—Number and Area Covered by Agriculture<sup>1</sup>**

Size of Holdings (in hectares)	Number of Holdings (in thousands)				Area Covered by Holdings (in thousands of hectares)			
	1960	1970	1980	1985	1960	1970	1980	1985
1–5	4,030	3,085	2,495	2,276	10,297	7,658	6,054	5,460
5–10	1,712	1,244	924	826	12,259	8,839	6,535	5,824
10–20	1,329	1,116	848	751	18,724	15,855	12,116	10,713
20–50	820	850	853	817	24,561	25,591	26,281	25,456
More than 50	265	291	339	367	25,516	34,034	37,893	40,181
Total	8,147	6,585	5,458	5,037	91,356	91,997	88,878	87,634

Sources: Commission of the European Communities, *The Agricultural Situation in the Community* (Brussels; Luxembourg: CEC), various issues; and Statistical Office of the European Communities, *Eurostat, Yearbook of Agricultural Statistics, 1986* (Luxembourg).

<sup>1</sup> Holdings smaller than 1 hectare not included. Totals may not add because of rounding and overlapping categories.

**Table 29. EC-10: Average Size of Agricultural Holding per Member State**

(In hectares)

	1960	1970	1980	1985
Belgium	8.2	11.6	15.4	16.7
Denmark	15.7	20.7	25.0	31.0
France	17.0	21.0	25.4	29.2
Germany, Fed. Rep. of	9.3	11.7	15.3	16.9
Greece	4.0	4.3	4.6	5.7
Ireland	17.1	17.7	22.6	22.7
Italy	6.8	7.5	7.4 <sup>1</sup>	8.0
Luxembourg	13.4	19.4	27.6	31.5
Netherlands	9.9	13.0	15.6	16.7
United Kingdom	32.0	56.8	68.7	69.4
EC-10	11.2	14.0	16.3	17.4

Sources: Commission of the European Communities (1988a); and Statistical Office of the European Communities, *Eurostat, Yearbook of Agricultural Statistics, 1986* (Luxembourg).

<sup>1</sup> 1977 national survey.

**Table 30. EC: Distribution of Farm Sizes in 1985 by Country**

(In percent of total)

Size <sup>1</sup>	Belgium	Denmark	France	Fed. Rep. of Germany	Greece	Ireland	Italy	Netherlands	Luxem- bourg	United Kingdom
Less than 2	0.6	—	0.7	1.1	12.1	3.1	5.2	—	0.7	0.2
2 less than 4	1.0	0.6	1.2	2.1	17.4	5.8	6.8	0.3	1.6	0.5
4 less than 8	2.6	2.8	3.2	5.2	29.1	11.9	10.6	1.4	3.8	1.6
8 less than 16	7.4	7.6	9.3	12.0	26.1	20.1	13.7	3.6	10.1	3.3
16 less than 40	34.7	28.8	34.1	39.0	12.3	36.6	20.6	17.7	52.2	12.9
More than 40	53.7	60.2	51.5	40.6	3.0	22.5	43.1	77.0	31.7	81.5

Source: Commission of the European Communities, *The Agricultural Situation in the Community* (Brussels; Luxembourg: CEC), various issues.

<sup>1</sup> Measured in European size unit.



**Table 31. OECD: Relative Labor Productivity in Agriculture<sup>1</sup>**

(Total economy = 100)

	1970–75	1976–80	1981–85 <sup>2</sup>	1981	1982	1983	1984	1985
Belgium	65.6	68.4	84.6	80.5	83.4	82.1	87.9	89.0
Denmark	46.8	59.9	76.3	70.9	74.6	67.3	87.7	80.9
France	50.6	53.2	65.3	57.7	65.5	63.6	69.1	70.5
Germany, Fed. Rep. of	31.2	35.3	40.4	37.5	44.2	39.2	41.4	39.5
Greece	39.6	39.4	41.5	41.1	44.8	39.2	41.4	41.0
Italy	40.5	44.3	55.6	50.3	53.8	58.6	57.6	58.3
Luxembourg	39.7	45.7	61.5	54.2	68.1	59.4	64.2	...
Netherlands	54.3	62.5	88.0	81.5	89.8	87.4	90.7	90.9
United Kingdom	58.4	60.7	73.4	70.6	74.5	68.5	78.8	74.6
EC-10 <sup>3</sup>	39.4	42.9	51.3	47.9	52.7	50.9	53.8	...
Portugal	12.0	35.8	43.1	44.6	47.4	48.2	48.2	52.1
Spain	41.7	48.2	51.1	48.6	46.9	49.6	53.8	56.5
United States	68.4	71.4	82.2	84.4	86.2	70.8	79.6	90.0
Japan	38.8	37.4	36.5	34.6	36.2	37.3	37.8	36.9
Canada	48.6	53.4	55.7	54.9	59.8	54.7	53.4	...
Australia	87.7	101.3	98.4	98.3	84.3	102.5	108.4	...
New Zealand	...	...	118.2	115.0	121.3	109.9	117.9	126.7
OECD <sup>4</sup>	34.9	37.3	41.5	40.5	42.5	40.3	42.6	...

Sources: OECD, *National Accounts and Labour Force Statistics*, various issues.<sup>1</sup> Labor productivity is measured as value added in constant market prices divided by employment. For the United Kingdom, value added is in constant factor prices.<sup>2</sup> For the period 1981–84 for Canada, Luxembourg, Australia, EC, and OECD.<sup>3</sup> Excluding Ireland.<sup>4</sup> Excluding Iceland, Ireland, New Zealand, Portugal, and Switzerland. Aggregates were calculated using 1980 purchasing power parities for GDP.**Table 32. EC-10: Revenue of the Agricultural Sector**

(Average of 1979–81 = 100)

	Net Value Added at Factor Costs <sup>1</sup>	Volume of Final Output <sup>1</sup>	Price Index of Final Output	Agricultural Terms of Trade <sup>2</sup>
1973	112.0	89.7	61.5	115.2
1974	101.6	90.4	64.6	101.3
1975	103.1	88.2	72.9	106.2
1976	105.3	88.4	82.6	108.8
1977	104.2	91.1	86.6	106.3
1978	106.5	95.7	88.3	107.6
1979	103.6	98.7	93.3	104.7
1980	97.3	100.6	98.5	98.7
1981	99.1	100.6	108.2	96.6
1982	109.3	105.7	116.2	97.3
1983	103.6	105.3	120.9	95.3
1984	109.3	109.1	123.0	93.2
1985	102.8	107.3	123.6	93.4
1986	103.7	109.7	123.0	95.9

Source: Statistical Office of the European Communities (1987).

<sup>1</sup> Per annual work unit, that is, the equivalent of the work done by one full-time worker in one year, deflated by the GDP deflator.<sup>2</sup> Price index of final output divided by price index of intermediate consumption.

**Table 33. Expenditure by the European Agricultural Guidance and Guarantee Fund, by Country**

(In percent; or millions of ECUs)

	1973	1981	1982	1983	1984	1985	1986
<i>(In percent of total expenditure)</i>							
Belgium	5.4	4.4	4.2	3.8	3.7	4.5	4.4
Denmark	8.5	4.5	4.4	4.2	4.7	4.1	4.8
France	29.9	27.7	23.3	22.7	19.7	23.1	24.9
Germany, Fed. Rep. of	20.3	18.2	16.4	19.3	18.0	17.9	20.0
Greece	—	1.4	5.4	6.2	5.3	6.4	6.5
Ireland	2.3	4.3	4.5	4.3	5.0	6.0	5.7
Italy	14.4	19.2	20.2	17.7	21.3	17.8	14.3
Luxembourg	0.1	0.1	—	—	—	—	—
Netherlands	14.8	10.2	11.1	10.5	10.5	10.1	10.2
United Kingdom	4.3	10.1	10.3	11.1	11.8	9.8	9.1
EC-10 Total							
<i>(in millions of ECUs)</i>	4,115.9	11,866.6	13,007.7	16,507.9	18,975.1	20,416.0	22,545.3
Guarantee <i>(in percent of total)</i>	95.4	93.9	95.1	95.6	96.4	95.7	96.8
Guidance <i>(in percent of total)</i>	4.6	6.1	4.9	4.4	3.6	4.3	3.2

Source: Commission of the European Communities, *Official Journal of the European Communities*, Vol. 30 (C336), December 15, 1987.**Table 34. Expenditure by the European Agricultural Guidance and Guarantee Fund, by Product**

(In percent of total guarantee expenditures)

	1981	1982	1983	1984	1985	1986
Cereals and rice	17.8	15.2	16.1	9.3	12.0	15.8
Sugar	7.0	10.0	8.3	8.9	9.1	7.8
Fats and protein plants	10.0	10.5	11.2	10.7	11.0	14.0
Fruit and vegetables	5.8	7.4	7.6	7.9	6.2	4.5
Wine	4.2	4.6	4.2	6.7	4.7	2.9
Tobacco	3.3	5.0	4.3	4.2	4.4	3.5
Milk products	30.5	26.9	27.8	29.7	30.1	24.4
Meat, eggs, and poultry	17.0	13.1	14.6	17.7	17.6	19.7
Other markets	3.7	4.7	3.5	3.0	3.7	5.1
Agrimonetary measures	2.2	2.5	3.1	2.1	1.0	2.2
Other expenditure	-1.5	0.0	-0.7	-0.1	0.2	0.3
Total <i>(in millions of ECUs)</i>	10,960.2	12,369.5	15,788.2	18,328.3	19,725.9	22,120.0

Source: Commission of the European Communities, *Official Journal of the European Communities*, Vol. 30 (C336), December 15, 1987.

**Table 35. EC-9: Agricultural Expenditure by the Member States in 1975 and 1980**

(In percent of expenditure by the EAGGF)

	1975			1980		
	National expenditure excluding social security	Social security outlays	Total	National expenditure excluding social security	Social security outlays	Total
Germany, Fed. Rep. of	244.6	186.8	431.4	63.0	78.1	141.1
France	183.8	292.5	476.3	92.2	219.7	311.9
Italy	270.0	473.7	743.8	149.3	357.2	506.5
Netherlands	36.9	33.8	70.7	21.0	19.7 <sup>1</sup>	40.8
Belgium	54.1	150.2	204.3	38.5	72.1	110.6
Luxembourg	240.0	250.0	490.0	146.8	254.0 <sup>2</sup>	400.8
United Kingdom	236.4	63.3	299.7	108.5	30.2	138.7
Ireland	72.5	47.6	120.1	59.2	37.2	96.4
Denmark	42.1	112.2	154.4	42.8	48.7	91.5
EC-9	179.4	224.3	403.7	80.1	143.1	223.2

Source: Commission des Communautés Européennes (1984).

<sup>1</sup> Social security outlays for 1977.<sup>2</sup> Social security outlays for 1979.**Table 36. EC-9: Agricultural Expenditure by the Member States and the EAGGF in 1975 and 1980**

(In percent of total)

	1975				1980			
	National expenditure excluding social security	National expenditure including social security	EAGGF	Total	National expenditure excluding social security	National expenditure including social security	EAGGF	Total
Germany, Fed. Rep. of	18.6	14.6	13.6	14.4	17.2	13.8	21.8	16.3
France	26.2	30.2	25.6	29.3	28.6	34.8	24.9	31.7
Italy	30.4	37.2	20.2	33.8	30.2	36.8	16.2	30.4
Netherlands	2.3	2.0	11.4	3.9	3.5	2.4 <sup>1</sup>	13.2	5.7
Belgium	1.2	2.0	3.9	2.4	2.4	2.5	5.0	3.3
Luxembourg	0.2	0.2	0.1	0.1	0.2	0.2 <sup>2</sup>	0.1	0.2
United Kingdom	17.5	9.8	13.3	10.5	11.3	5.2	8.3	6.1
Ireland	2.1	1.5	5.2	2.2	3.8	2.2	5.1	3.1
Denmark	1.6	2.6	6.7	3.4	2.9	2.2	5.4	3.2
EC-9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Commission des Communautés Européennes (1984).

<sup>1</sup> Social security outlays for 1977.<sup>2</sup> Social security outlays for 1979.

**Table 37. Welfare Effects of the CAP on EC Members**

(In billions of 1980 U.S. dollars per year)

Source	Commodity(ies)	Country(ies)	Model Structure	Year	Effects on				
					Consumers (a)	Taxpayers (b)	Producers (c)	Total	
								Absolute	Relative (d)
Koester and Schmitz (1982)	Sugar	EC-9	PE	1978–79				– 0.4	
Morris (1980)	Main CAP commodities	EC-9	PE	1978	– 43.5	– 10.7	38.6	– 15.6	– 0.53% of EC-9 GDP Transfer ratio of 1.40 <sup>3</sup>
Thomson and Harvey (1981)	All CAP commodities	EC-9	PE	1980 <sup>4</sup>					Transfer ratio of 1.77 <sup>3</sup>
Australia, Bureau of Agricultural Economics (1985)	All CAP commodities	EC-9	PE	1978	– 35.4	– 18.1	44.1	– 9.4	– 0.48% of EC-9 GDP Transfer ratio of 1.21 <sup>3</sup>
		EC-10	PE	1983	– 25.6	– 20.8	39.7	– 6.7	– 0.32% of EC-10 GDP Transfer ratio of 1.17 <sup>3</sup>
Buckwell and others (1982)	All CAP commodities	EC-9	PE	1980	– 34.6	– 11.5	30.7	– 15.4	– 0.55% of EC-9 GDP Transfer ratio of 1.5 <sup>4</sup>
Tyers (1985)	Rice, wheat, coarse grains, ruminant and nonruminant meat	EC-9	PE	1980	– 44.0	– 0.9	13.9	– 31.0 <sup>5</sup>	– 1.1% of EC-9 GDP Transfer ratio of 3.23
Tyers and Anderson (1986a)	Rice, wheat, coarse grains, ruminant and nonruminant meat, dairy, sugar	EC-10	PE	1985 <sup>3</sup>	– 49.0	– 2.2	27.2	– 24.1 <sup>5</sup>	– 1.3% of EC-10 GDP Transfer ratio of 1.88 <sup>3</sup>
Spencer (1985)	All CAP commodities	EC-9	GE	1980					Approx. – 0.9% of EC-9 GDP
Burniaux and Waelbroeck (1985)	All CAP commodities	EC-10	GE	1995					– 2.7% of EC-10 GDP
Tyers and Anderson (1987a, 1987b)	Rice, wheat, coarse grains, ruminant and nonruminant meat, dairy, sugar	EC-12	PE	1980–82	– 42.3	– 0.9	36.4	– 6.8 <sup>6</sup>	– 0.27% of EC-12 GDP Transfer ratio of 1.19
OECD (1987)	All CAP commodities	EC-9	PE	1979–81	– 27.8				

<sup>1</sup> EC-9 comprises Belgium, Denmark, France, the Federal Republic of Germany, Ireland, Italy, Luxembourg, the Netherlands, and the United Kingdom; EC-10 is EC-9 plus Greece; EC-12 is EC-10 plus Portugal and Spain.

<sup>2</sup> PE = partial equilibrium (single- or multisector) and GE = general equilibrium.

<sup>3</sup> The transfer ratio is defined as the cost to the economy of increasing farmers' incomes by 1 unit; in other words, columns  $\frac{(a) + (b)}{(c)}$ .

<sup>4</sup> The Thomson and Harvey (1981) results are for 1980, but their model used data from 1975 for calibration.

<sup>5</sup> Results are for 1985, but the model is calibrated to data from 1980–82.

<sup>6</sup> Includes change in net government revenue and profits from storage.



**Table 38. Welfare Effects of the CAP by Country in 1980**

(In millions of U.S. dollars)

Country	Consumers	Taxpayers	Producers	Net	Transfer Ratio
EC-9	- 34,580	- 11,494	30,686	- 15,388	1.50
Germany, Fed. Rep. of	- 12,555	- 3,769	9,045	- 7,279	1.80
France	- 7,482	- 2,836	7,237	- 3,081	1.42
Italy	- 5,379	- 1,253	3,539	- 3,093	1.87
Netherlands	- 1,597	- 697	3,081	787	0.74
Belgium/Luxembourg	- 1,440	- 544	1,624	- 320	1.22
United Kingdom	- 5,174	- 1,995	3,461	- 3,708	2.07
Ireland	- 320	- 99	965	546	0.43
Denmark	- 635	- 302	1,736	799	0.54

Sources: Buckwell and others (1982), pp. 90–134; and Fund staff calculations.

**Table 39. Trading Position of the EC**

(In billions of U.S. dollars)

	1978	1985
Agricultural exports		
EC-12 <sup>1</sup>	18.4	26.1
United States	33.0	33.5
Canada	8.1	12.0
Australia	6.2	8.1
Agricultural imports		
EC-12 <sup>1</sup>	49.4	46.7
United States	22.3	30.8
Canada	4.1	5.4
Australia	1.1	1.6

Source: Commission of the European Communities (1988a).

<sup>1</sup> Excludes intra-EC trade.**Table 40. EC: Export Share in World Agricultural Exports<sup>1</sup>**

	1970–71	1973–74	1975–76	1977–78	1979–80	1980–81	1981–82	1982–83
Wheat	8.1	8.3	12.9	6.8	12.1	15.6	15.2	17.1
Wheat flour	47.6	60.0	54.4	54.0	61.6	66.4	67.3	61.5
Total grains	...	7.8	9.1	...	8.2	10.1	8.6	...
Beef and veal	2.6	6.3	8.9	2.9	18.4	18.2	13.9	...
Butter	31.1	47.5	18.4	43.1	57.2	59.3	52.6	46.8
Nonfat dairy products	22.9	29.9	28.5	36.8	62.9	56.9	49.5	50.3
Cheese	28.1	26.9	36.6	36.6	38.5	41.1	43.6	44.5
Broilers	36.6	26.5	39.0	38.0	37.4	35.4	34.7	39.3
Shell eggs for consumption	...	...	...	...	20.0	28.0	37.5	52.4
Sugar	6.2	4.3	3.4	9.5	13.8	16.2	18.4	18.5

Source: Koester and Bale (1984), p. 5.

<sup>1</sup> EC export quantities as percentage of world export quantities, excluding intra-EC trade.

**Table 41. EC: Exports of Agricultural Products to Various Groups of Countries<sup>1</sup>**

	Millions of ECUs				Percent of Total EC			
	1983	1984	1985	1986	1983	1984	1985	1986
World total <sup>2</sup>	82,288	95,731	100,920	98,558	...	...	...	...
Total EC-12, intra-EC	54,644	62,554	66,415	69,044	...	...	...	...
Total EC-12, extra-EC	27,644	33,176	34,505	28,804	100.0	100.0	100.0	100.0
Industrial countries	11,497	14,557	16,120	14,495	41.6	43.9	46.7	50.3
<i>Of which: United States</i>	4,190	5,465	6,347	5,160	15.2	16.5	18.4	17.9
<i>Canada</i>	671	946	992	815	2.4	2.9	2.9	2.8
<i>Japan</i>	1,049	1,497	1,547	1,459	3.8	4.5	4.5	5.1
Developing countries	12,582	15,202	14,702	1,970	45.5	45.8	42.6	41.6
<i>Of which: Argentina</i>	28	27	25	33	0.1	0.1	0.1	0.1
<i>Brazil</i>	104	113	139	448	0.4	0.3	0.4	1.6
<i>Morocco</i>	275	277	485	229	1.0	0.8	1.4	0.8
State-trading countries	3,436	3,249	3,480	2,340	12.4	9.8	10.1	8.1
<i>Of which: Poland</i>	380	455	410	301	1.4	1.4	1.2	1.0
<i>Hungary</i>	161	160	142	144	0.6	0.5	0.4	0.5
<i>Romania</i>	51	60	77	145	0.2	0.2	0.2	0.5
Western Europe <sup>3</sup>	4,713	5,415	5,977	6,039	17.0	16.3	17.3	21.0
<i>Of which: Yugoslavia</i>	263	343	348	280	1.0	1.0	1.0	1.0
Industrial Commonwealth <sup>4</sup>	1,229	1,672	1,702	1,390	4.4	5.0	4.9	4.8
Mediterranean basin <sup>5</sup>	4,095	5,122	4,949	3,449	14.8	15.4	14.3	12.0
Latin America, Central and South	734	806	828	1,052	2.7	2.4	2.4	3.7
Africa, Caribbean, and Pacific								
(Lomé Convention)	2,499	2,569	2,830	2,317	9.0	7.7	8.2	8.0

Source: Commission of the European Communities, *The Agricultural Situation in the Community*, various issues.<sup>1</sup> EC-12, product groups SITC 0, 1, 21, 22, 232, 24, 261–265 + 268, 29, 4, 592.11 + 12.<sup>2</sup> Not including confidential, ships' stores, etc.<sup>3</sup> Austria, Finland, Iceland, Norway, Sweden, Switzerland, Yugoslavia.<sup>4</sup> Australia, Canada, New Zealand, South Africa.<sup>5</sup> Algeria, Cyprus, Egypt, Israel, Jordan, Lebanon, Libya, Malta, Morocco, Syrian Arab Republic, Tunisia, Turkey.**Table 42. EC: Imports of Agricultural Products from Various Groups of Countries<sup>1</sup>**

	Millions of ECUs				Percent of Total EC			
	1983	1984	1985	1986	1983	1984	1985	1986
World total <sup>2</sup>	107,905	123,105	128,301	123,140	...	...	...	...
Total EC-12, intra-EC	54,628	61,570	67,673	70,078	...	...	...	...
Total EC-12, extra-EC	53,276	61,534	60,627	52,802	100.0	100.0	100.0	100.0
Industrial countries (class I)	23,702	25,442	23,343	20,071	44.5	41.3	38.5	38.0
<i>Of which: United States</i>	11,709	11,909	9,524	7,701	22.0	19.4	15.7	14.6
<i>Canada</i>	1,840	1,880	1,628	1,379	3.5	3.1	2.7	2.6
<i>Japan</i>	230	319	290	277	0.4	0.5	0.5	0.4
Developing countries (class II)	25,590	31,526	32,421	28,230	48.0	51.2	53.5	53.5
<i>Of which: Argentina</i>	2,006	2,891	2,843	1,983	0.8	4.7	4.7	3.8
<i>Brazil</i>	4,731	5,671	6,357	4,002	8.9	9.2	10.5	7.6
<i>Morocco</i>	461	471	595	586	0.9	0.8	1.0	1.1
State-trading countries (class III)	3,829	4,442	4,703	4,500	7.2	7.2	7.8	8.5
<i>Of which: Poland</i>	536	694	836	746	1.0	1.1	1.4	1.4
<i>Hungary</i>	574	665	728	590	1.1	1.1	1.2	1.1
<i>Romania</i>	131	166	168	152	0.2	0.3	0.3	0.3
Western Europe <sup>3</sup>	5,591	6,241	6,258	6,109	10.5	10.1	10.3	11.6
<i>Of which: Yugoslavia</i>	628	668	675	625	1.2	1.1	1.1	1.2
Industrial Commonwealth <sup>4</sup>	5,146	5,862	6,013	4,958	9.7	9.5	9.9	9.4
Mediterranean basin <sup>5</sup>	2,771	3,192	3,400	2,816	5.2	5.2	5.6	5.3
Latin America, Central and South	10,416	12,699	13,503	10,693	19.6	20.6	22.3	20.3
Africa, Caribbean, and Pacific								
(Lomé Convention)	6,797	8,947	9,162	8,760	12.8	14.5	15.1	16.6

Source: Commission of the European Communities, *The Agricultural Situation in the Community*, various issues.<sup>1</sup> EC-12, product groups SITC 0, 1, 21, 22, 232, 24, 261–265 + 268, 29, 4, 592.11 + 12.<sup>2</sup> Not including confidential, ships' stores, etc.<sup>3</sup> Austria, Finland, Iceland, Norway, Sweden, Switzerland, Yugoslavia.<sup>4</sup> Australia, Canada, New Zealand, South Africa.<sup>5</sup> Algeria, Cyprus, Egypt, Israel, Jordan, Lebanon, Libya, Malta, Morocco, Syrian Arab Republic, Tunisia, Turkey.

**Table 43. Effects of the CAP on International Prices**

(Percent change in world market prices following complete liberalization)

Source <sup>1</sup>	EC Concept <sup>2</sup>	Base Year	Wheat	Coarse Grains	Rice	Ruminant Meat	Nonruminant Meat	Sugar	Dairy
Koester and Schmitz (1982)	EC-9	1979						12.0	
Koester (1982)	EC-9	1975–77	9.6	14.3 <sup>3</sup>					
Koester and Valdes (1984)	EC-9	1980	4.6			10.5 <sup>4</sup>	5.9 <sup>5</sup>	9.7	28.3 <sup>6</sup>
Sarris and Freebairn (1983)	EC-9	1978–80	9.2						
Anderson and Tyers (1984) <sup>7</sup>	EC-9	1980	13.0	16.0	5.0	17.0	1.0		
Tyers and Anderson (1986a)	EC-10	1985 <sup>8</sup>	0.7	2.5	0.7	9.5	1.7	2.6	11.8
Matthews (1985b)	EC-10	1978–82	0.7	2.9 <sup>3</sup>	0.1	4.5 <sup>9</sup>	3.6 <sup>5</sup>	6.0	10.5 <sup>6</sup>
Tyers and Anderson (1986b)	EC-12	1980–82	6.0	5.0	3.0	18.0	4.0	7.0	25.0

<sup>1</sup> All studies cited base their results on partial equilibrium analysis.<sup>2</sup> EC-9 comprises Belgium, Denmark, France, Federal Republic of Germany, Ireland, Italy, Luxembourg, the Netherlands, and the United Kingdom; EC-10 is EC-9 plus Greece; EC-12 is EC-10 plus Portugal and Spain.<sup>3</sup> Reported figure refers to barley only.<sup>4</sup> Reported figure refers to beef only.<sup>5</sup> Average of estimated effect on the prices of pork and poultry.<sup>6</sup> Reported figure refers to butter only.<sup>7</sup> Same results also reported in Tyers (1985).<sup>8</sup> Results for 1985, but the model is calibrated to data from 1980–82.<sup>9</sup> Average of estimated effect on the prices of beef and mutton.

**Table 44. Effects of the Abolition of the CAP on World Trade <sup>1</sup>**(Change in volume following complete liberalization; in millions of tons)<sup>2</sup>

	EC Concept <sup>3</sup>	Base Year	Net Imports to the EC	Net Imports to Developed Countries (including EC)	Net Imports to Developing Countries	Total Volume Traded
<b>Wheat</b>						
Koester (1982)	EC-9	1975–77		– 8.5	– 3.4	18.6
Anderson and Tyers (1984)	EC-9	1980	14.7			
Tyers (1985)	EC-9	1980	14.7			12.3
Tyers and Anderson (1986a)	EC-10	1985 <sup>4</sup>	– 2.4	– 0.2	0.2	0.0
Tyers and Anderson (1986b)	EC-12	1980–82		4.5	– 4.9	– 4.0
<b>Coarse grains</b>						
Koester (1982)	EC-9	1975–77		– 10.0 <sup>5</sup>	– 5.3 <sup>5</sup>	68.5 <sup>5</sup>
Anderson and Tyers (1984)	EC-9	1980	26.0			
Tyers (1985)	EC-9	1980	26.0			23.2
Tyers and Anderson (1986a)	EC-10	1985 <sup>4</sup>	5.9	3.0	– 3.3	4.0
Tyers and Anderson (1986b)	EC-12	1980–82		4.0	2.3	0.0
<b>Rice</b>						
Anderson and Tyers (1984)	EC-9	1980	– 0.2			
Tyers (1985)	EC-9	1980	– 0.2			
Tyers and Anderson (1986a)	EC-10	1985 <sup>4</sup>	0.1	0.1	– 0.1	0.0
Tyers and Anderson (1986b)	EC-12	1980–82		3.8	– 4.0	– 1.0
<b>Ruminant meat</b>						
Anderson and Tyers (1984)	EC-9	1980	3.0			
Tyers (1985)	EC-9	1980	3.0			2.7
Tyers and Anderson (1986a)	EC-10	1985 <sup>4</sup>	5.3	3.2	– 2.6	107.0
Tyers and Anderson (1986b)	EC-12	1980–82		5.6	– 2.9	58.0
<b>Nonruminant meat</b>						
Anderson and Tyers (1984)	EC-9	1980	– 2.0			
Tyers (1985)	EC-9	1980	– 2.0			2.0
Tyers and Anderson (1986a)	EC-10	1985 <sup>4</sup>	– 0.5	0.0	– 0.0	3.0
Tyers and Anderson (1986b)	EC-12	1980–82		1.7	– 0.7	– 6.0
<b>Sugar</b>						
Tyers and Anderson (1986a)	EC-10	1985 <sup>4</sup>	3.0	2.8	– 2.6	– 5.0
Tyers and Anderson (1986b)	EC-12	1980–82		2.3	– 2.9	0.0
<b>Dairy</b>						
Tyers and Anderson (1986a)	EC-10	1985 <sup>4</sup>	38.8	29.7	– 19.6	34.0
Tyers and Anderson (1986b)	EC-12	1980–82		14.0	– 22.0	17.0

<sup>1</sup> All the studies cited base their results on partial equilibrium analysis.<sup>2</sup> Metric tons.<sup>3</sup> EC-9 comprises Belgium, Denmark, France, Federal Republic of Germany, Ireland, Italy, Luxembourg, the Netherlands, and the United Kingdom; EC-10 is EC-9 plus Greece; EC-12 is EC-10 plus Portugal and Spain.<sup>4</sup> Results for 1985, but the model is calibrated to data from 1980–82.<sup>5</sup> Reported figure refers to barley and maize only.



**Table 45. Effects of a Complete Liberalization of the CAP on the Welfare of Non-EC Countries**

(Change in real income following complete liberalization; in billions of 1980 U.S. dollars)

Source	Commodity (ies)	EC Concept <sup>1</sup>	Model Structure <sup>2</sup>	Base Year	Non-EC Developed Countries <sup>3</sup>	Developing Countries
Koester (1982)	Wheat, coarse grains	EC-9	PE	1979	0.9 <sup>4</sup>	- 0.5
Koester and Schmitz (1982)	Sugar	EC-9	PE	1979		- 2.3
Anderson and Tyers (1984)	Wheat, rice, coarse grains, ruminant and nonruminant meat	EC-9	PE	1981 <sup>5</sup>	- 1.5	- 3.7
Tyers (1985)	Wheat, rice, coarse grains, ruminant and nonruminant meat	EC-9	PE	1980	0.4	- 1.8
Matthews (1985b)	Wheat, rice, coarse grains, ruminant and nonruminant meat, oilseeds, sugar, dairy	EC-10	PE	1978-82		- 0.5
Tyers and Anderson (1986a)	Wheat, rice, coarse grains, ruminant and nonruminant meat, sugar, dairy	EC-10	PE	1985 <sup>6</sup>	- 4.1	- 5.9
Tyers and Anderson (1987)	Wheat, rice, coarse grains, ruminant and nonruminant meat, sugar, dairy	EC-12	PE	1980-82	0.1	- 10.5

<sup>1</sup> EC-9 comprises Belgium, Denmark, France, Federal Republic of Germany, Ireland, Italy, Luxembourg, the Netherlands, and the United Kingdom; EC-10 is EC-9 plus Greece; EC-12 is EC-10 plus Portugal and Spain.

<sup>2</sup> PE = partial equilibrium model.

<sup>3</sup> Australia, Canada, Japan, New Zealand, and the United States.

<sup>4</sup> Koester's developed countries group also includes Austria, Switzerland, and the Nordic countries.

<sup>5</sup> Anderson and Tyers estimate the final effects in 1990 of a 2 percent a year reduction in CAP support prices from 1981 to 1990.

<sup>6</sup> Results for 1985, but the model is calibrated to data from 1980-82.

**Table 46. Effects of the CAP on International Price Stability**

(Percent share of variability of the world price owing to the CAP)

Source	EC Concept <sup>2</sup>	Base Year	Measure of Variation Used <sup>3</sup>	Wheat	Course Grains	Rice	Ruminant Meat	Nonruminant Meat	Dairy Products	Sugar
Svedberg (1981)	EC-6	1967-72	D		7.0 <sup>4</sup>					
Sarris and Freebairn (1983)	EC-9	1978-80	SD	19.8						
Schmitz and Koester (1984)	EC-10	1982	CV							8.5
Anderson and Tyers (1984)	EC-9	1980	CV	50.0	33.0	12.1	25.0	0.0		
Tyers (1985)	EC-9	1980	SD	44.0	24.0	6.0	11.0	7.0		
Tyers and Anderson (1986a)	EC-10	1985	CV	24.0	5.0	9.6	16.7	22.0	60.0	5.0
Tyers and Anderson (1987)	EC-12	1980-82	CV	32.8	15.1	15.8	37.4	0.0	50.0	22.2

<sup>1</sup> All the studies cited base their results on partial equilibrium analysis.

<sup>2</sup> EC-6 comprises Belgium, France, Federal Republic of Germany, Italy, Luxembourg, and the Netherlands; EC-9 is EC-6 plus Denmark, Ireland, and the United Kingdom; EC-10 is EC-9 plus Greece; EC-12 is EC-10 plus Portugal and Spain.

<sup>3</sup> D = change in the price level following a 5 percent production shortfall; SD = standard deviation; CV = coefficient of variation.

<sup>4</sup> The reported figure applies to a price index for wheat and coarse grains.

**Table 47. EC-10: Agricultural Support Prices and Inflation, 1981/82–1988/89**

(Change in percent over preceding year)

Marketing Year <sup>1</sup>	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89 <sup>2</sup>
Support prices:								
In ECUs	9.2	10.4	4.2	−0.5	0.1	−0.3	−0.2	— <sup>3</sup>
In national currencies	10.9	12.2	6.9	3.3	1.8	2.2	0.2	0.3 <sup>3</sup>
Rate of inflation <sup>4</sup>	10.7	10.7	8.3	6.6	5.9	5.5 <sup>5</sup>	3.9 <sup>5</sup>	3.6 <sup>5,6</sup>

Sources: Commission of the European Communities, *The Agricultural Situation in the Community*, various issues; and Commission of the European Communities (1987b).

<sup>1</sup> The marketing year begins on April 1.

<sup>2</sup> EC-12.

<sup>3</sup> Proposal submitted by the European Commission to the Council of Ministers in March 1988.

<sup>4</sup> As measured by the GDP deflator.

<sup>5</sup> Calendar year, EC-12.

<sup>6</sup> Projection by the European Commission.

## Appendix II

# The Arithmetic of the Monetary Compensatory Amounts (MCAs)

The CAP has always made use of a unit of account to express decisions involving prices. Initially, when the Bretton Woods system was still in force and the member states had par values expressed in dollars, it was the dollar that served as a unit of account. During the period August–December 1971, when the dollar floated for the first time, the member states decided not to let their currencies float against each other and to keep them within the bilateral fluctuation margins originally derived from their respective fluctuation margins around the dollar. The unit of account thus began to lead a life of its own: its value was no longer equal to the dollar but had to be derived from the par values of the member states. In the spring of 1973, the link between the dollar and the currencies of the member states was again severed. The problem this posed for the unit of account was solved in the same way as the first time round. The arrangement was given a permanent character by the fact that the conversion rates of the unit of account were based on the central rates of the countries participating in the European narrow margins agreement (the “snake”). In April 1979, the month following the creation of the EMS, the ECU was substituted for the unit of account without affecting the common price level expressed in national currencies.<sup>73</sup>

The unit of account has always been converted into the member states’ currencies at fixed rates. For a country that participates in the EMS exchange rate mechanism, this means that the conversion rate of the unit of account—commonly known as the green rate—is in principle equal to the central rate and that exchange rate fluctuations within the allowable margins are disregarded. When the currency of a member state floats independently, or when its agricultural prices are not adjusted fully in terms of its national currency at the time of an exchange rate realignment, the green rate no longer corresponds to the central rate. MCAs are then created to prevent this “monetary gap” from giving rise to trade distortions. MCAs are called positive when the currency has appreciated against the green rate, and they serve as import levies and export subsidies; they are negative when the currency has depreciated, and they serve as import

subsidies and export levies. There have been significant adjustments over time in the way MCAs are calculated but finding the monetary gap remains the first step.

For a country with a central rate, the monetary gap is the difference between this rate and the green rate, expressed as a percentage.<sup>74</sup> Fluctuations of the exchange rate within the agreed margins around the central rate are disregarded, because their incidence on prices is believed to be insignificant. This is not the case with currencies that float independently—the drachma, the escudo, the peseta, and the pound sterling—and with the lira, which has a fluctuation margin that is considered too wide for the purposes of the common price policy (6 percent, against 2.25 percent for the other currencies in the EMS exchange rate mechanism). For these currencies, the monetary gap is calculated as the difference between the market rate of exchange and the green rate. The monetary gaps of these currencies are calculated anew every week and the MCAs are changed whenever the calculation yields a rate that differs by 1 percentage point or more from that of the preceding week.<sup>75</sup> Thus, while it takes a realignment to modify MCAs of countries participating in the EMS exchange rate mechanism, the MCAs of other countries are liable to change frequently.

There is a significant departure from the principle that a country’s MCAs correspond to its monetary gap. Since 1973, a “neutral margin” is deducted in the calculation of negative MCAs as a means to save money for the common budget. It was extended to positive MCAs in 1979 to satisfy the demand that all countries be treated alike. The upshot is a reduction in the extent to which MCAs can be used to maintain price differences among the member states. At present, the neutral margin stands at 1 point for the Netherlands and 1.5 points for the other member countries, except that it amounts to 5 points for wine and for poultry and eggs, and to 10 points for olive oil. How MCAs are computed when a neutral margin needs to be deducted, is illustrated in Example I of Table 48.

<sup>74</sup> The equation is  $\text{monetary gap} = \left(1 - \frac{\text{central rate}}{\text{green rate}}\right) 100$ .

<sup>75</sup> The calculations are based on data for the week ending on Tuesday. If a change is warranted, it becomes effective on the following Monday. More frequent changes have been ruled out in order not to hamper trade.

<sup>73</sup> Commission of the European Communities (1982).

**Table 48. The Computation of Monetary Compensatory Amounts—Illustrative Examples for the French Franc**

*Example I:* Calculation of MCAs with ECU as numeraire.

French franc central rate: 6.87

French franc green rate: 6.55

$$\text{Monetary gap: } \left(1 - \frac{\text{central rate}}{\text{green rate}}\right) 100 = -4.89$$

Deducting the neutral margin of 1.5 points and rounding yields an applied monetary gap of -3.4.

*Example II:* Level to which MCAs for the French franc have to be raised if the positive MCAs for the deutsche mark are lowered by 3 points, with no change in the Federal Republic of Germany's central green rate.

A. Calculation of *correcting factor*:

DM central rate: 2.24

DM green rate: 2.54

Monetary gap: 11.8

With an unchanged green rate, a reduction in the monetary gap to 8.8 would require a central rate of DM 2.32. This rate is called the "green central rate."

$$\text{Correcting factor: } \frac{2.32}{2.24} = 1.0357.$$

B. New MCA level for French franc

French franc green central rate = central rate x correcting factor

In this instance:  $6.87 \times 1.0357 = 7.115$ .

New monetary gap, calculated with green central rate: -8.625.

After deducting neutral margin and rounding: -7.1.

*Example III:* New level of MCAs for France resulting from a realignment in which the deutsche mark was revalued by 3 percent against the ECU and the French franc devalued by 0.5 percent.

a. As the French franc was devalued by 0.5 percent against the ECU, its central rate becomes  $6.87 \times 1.005 = 6.904$ .

b. Correcting factor will rise from 1.0357 before realignment to  $1.0357 \times 1.03 = 1.0668$ .

c. It should be remembered that the monetary gap is calculated with the help of the green central rate = central rate  $\times$  correcting factor.

The Federal Republic of Germany's green central rate does not change, as the change in the correcting factor offsets the change in the central rate. All other green central rates change by the difference between the revaluation against the ECU of its own central rate and that of the deutsche mark. Relevant figures are obtained by multiplying central rates by the correcting factor.

French franc green central rate:  $6.904 \times 1.0668 = 7.365$ .

d. Monetary gap for French franc: -12.44.

After deducting neutral margin and rounding: -10.9.

Source: Derived from historical data presented in the Commission of the European Communities (1987d).

In mid-1984, it was decided to phase out positive MCAs by basing the system on the strongest currency participating in the EMS exchange rate mechanism, that is, the currency that has been revalued most on the occasion of the latest realignment. There were actually two measures. First, there was the conversion of part of the stock of positive MCAs in countries with an undervalued green rate (i.e., with support prices in domestic currency higher than the Community-wide level) into negative MCAs in other countries. This decision, referred to as the "switch over," amounted to an

increase in the common price level, as shown by the narrowing of the margin by which prices in the Federal Republic of Germany and the Netherlands exceeded the common level. Second, the common price level was tied to the strongest currency in the event of new realignments. Thus, realignments would no longer create a need to lower prices expressed in domestic currency in the country with the strongest currency and, correspondingly, there would be more scope than under the old system for raising prices in the other countries.

These decisions could have been implemented by adopting the deutsche mark as the new numeraire. Instead, it was decided to compute the monetary gap as the difference between the green rate and an adjusted central rate, called the “green central rate.” The latter is obtained by multiplying the central rate by a “correcting factor” so as to devalue notionally all currencies against the ECU (by increasing the number of currency units per ECU). In the case of the switch over, the correcting factor is derived by calculating the rate of devaluation of the central rate of the deutsche mark

needed to obtain the desired reduction in positive MCAs. (The logic behind this is that, when the green rate is kept unchanged, positive MCAs can decline only on account of a lowering of the central rate.) Example II of Table 48 shows how this is done and what the impact is on France’s negative MCAs. As may be seen from Example III, the inverse route is followed in the computations made on the occasion of a realignment. Here, the increase in the correcting factor is given by the rate of revaluation of the deutsche mark and is used to shift downward the entire grid of MCAs.



## Appendix III

# The Effects of the CAP: A Survey of the Literature

Sections III and IV of the main paper discussed the costs and benefits of the Common Agricultural Policy, first, within the EC and then for the rest of the world. The objective there was only to highlight the main domestic and international effects of EC agricultural policies. That presentation, however, drew upon a detailed survey of the literature which is presented more fully in this appendix.

For the purposes of the analysis here, the “domestic effects” are the welfare gains and losses of producers, consumers, and taxpayers, the effects on other sectors, and the deadweight costs to the economy as a whole. The “international effects” are the effects on world commodity prices, the volume and pattern of international agricultural trade, and the welfare of the rest of the world. Also included in this category is the effect of the CAP on the stability of world commodity prices.

To facilitate a comparison and evaluation of the empirical evidence, the discussion begins with a restatement of the standard conceptual framework for the welfare analysis of price support and of its limitations. Subsequently, the evidence is examined under four headings: domestic welfare, international trade, welfare of non-EC countries, and stability of world prices. The appendix ends by focusing on the conclusions that may be culled from the literature and their relevance to the current debate on agricultural policy reform.

### The Theory

Although the structure of the CAP is complicated, for the large majority of products the basic method of implementation is through price support. This is achieved by a variety of instruments, such as intervention purchases, market withdrawals, export restitutions, minimum import prices and import levies.<sup>76</sup> Other price support devices (e.g., deficiency payments) and nonprice support instruments (storage aids, input subsidies, voluntary export restraint (VER) agreements with nonmember countries, etc.) are also used but on a more limited scale.

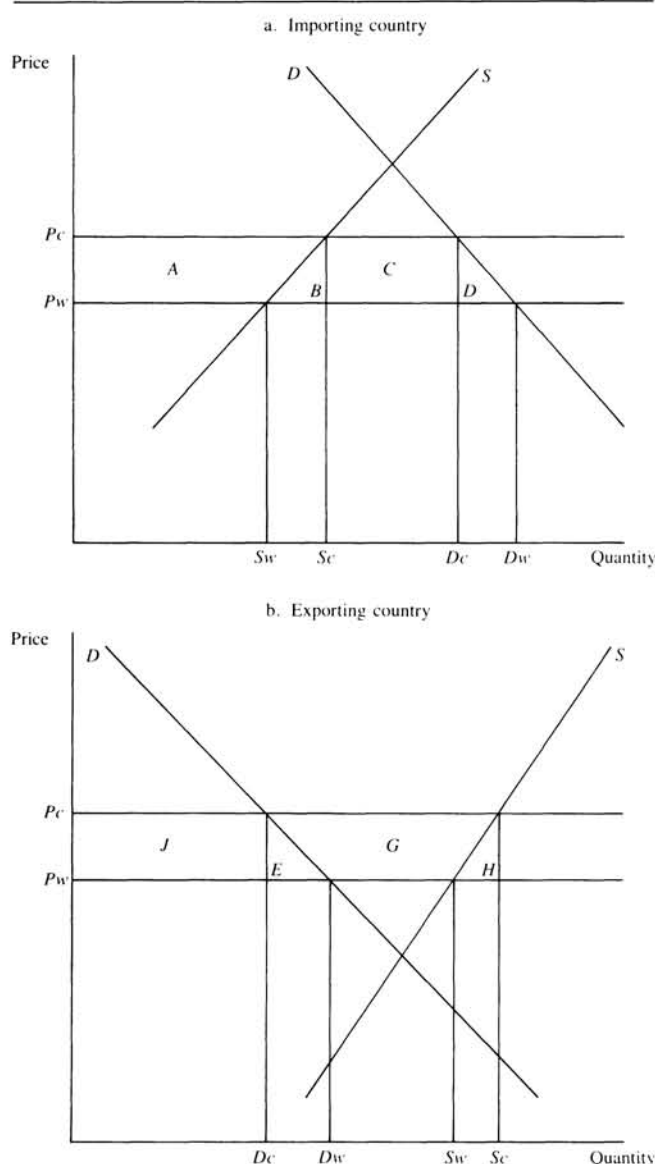
<sup>76</sup> Some of the secondary objectives of the CAP, such as improving the quality of food consumed, improving the distribution of income within the agricultural sector, protecting small family farms and preserving rural life styles and the natural environment, create the need for a different family of instruments that generally go under the name of guidance expenditure.

The simplest way to examine the effects of price support on domestic welfare is the single-good partial equilibrium analysis. Chart 2, panel (a) illustrates the case of a small importing country. If the world price is  $P_w$  but the domestic price is maintained at  $P_c$  by a tariff, production is at  $S_c$ , consumption at  $D_c$ , and the difference is imports. Reducing consumption below and increasing production above what they would be if the world price prevailed entails a consumer loss of  $A + B + C + D$ , a producer gain of  $A$  and an increase in government revenue of  $C$ . The net welfare loss (or, alternatively, the net welfare gain of liberalizing) is  $B + D$ . Price support in an exporting country by means of an export subsidy is illustrated in panel (b). Here the consumer loss is  $J + E$ , the government expenditure  $E + G + H$ , and the producer gain  $J + E + G$ ; by subtraction the net welfare loss is  $E + H$ .

This simple domestic welfare analysis treats the EC as a single entity. To examine the country-specific effects of the CAP the previous analysis has to be modified in three ways. First, it has to allow for intra-EC commodity trade (Buckwell and others, 1982). Some of the imports of an importing country will now originate in other Community members and, therefore, be priced at the CAP support level. Consequently, part of the tariff revenue  $C$  will now be forgone. Similarly, part of the government expenditure for subsidies in an exporting country will now be avoided, since the gain to producers is generated directly by sales to other Community members at the high protected prices.

Second, the analysis has to capture the function of the so-called agri-monetary system of the EC. The MCAs that came into effect in the early 1970s to protect farmers from national currency fluctuations essentially allow member countries to maintain domestic prices different from the common CAP support levels. Importers in a country with a domestic price lower than  $P_c$  can be thought of as paying  $P_c$  at the border for imports from other members and then getting a subsidy to allow these imports to compete in the domestic market. Exporters in that country must pay a tax on their exports in order not to undermine the higher prices in the rest of the Community. The situation in a member country that maintains a domestic price higher than  $P_c$  is the opposite.

Third, the principle of common financing, which means that the Community is collectively responsible for paying

**Chart 2. The Economics of Price Support: The Single-Country Case**

the subsidies for (and receiving the tariff revenue generated by) all products covered by the CAP, requires that additional transfers between the EC and members' budgets be taken into account.

Even after introducing these additional considerations to make the model capture the supranational character of the CAP, the partial equilibrium analysis still retains its simplicity. Its usefulness is limited, however, by the strong assumptions that underlie it.<sup>77</sup> In what follows, the main

<sup>77</sup> For a discussion of the partial equilibrium welfare analysis and its advantages see: Corden (1957) and (1971); Harberger (1959); Johnson (1960); and Currie, Murphy, and Schmitz (1971). For a discussion of its limitations, in particular with respect to analyzing agricultural price support in the EC, see Buckwell and others (1982); Valdes and Zietz (1980); Matthews (1985b); and Winters (1987).

difficulties of assessing the effects of price support by means of the partial equilibrium model are outlined, and ways of dealing with these difficulties are discussed.

1. The analysis of price support, even when amended to take into account the aforementioned intra-EC transfers, is designed to capture the effects of one specific policy. There are, however, many different CAP price-support instruments, not all of which have the same effect. Deficiency payments, for example, differ from export subsidies in that, as consumers pay the world price, there are no consumer losses. Nontariff barriers or variable import levies do not generate the same revenues as ad valorem tariffs. These differences are very hard to capture in the model.

2. The analysis in Chart 2 implicitly assumes that the country is a price taker in the world market. This "small country" assumption means that, no matter what the level of domestic protection is, the world price remains unaffected. The welfare effects of price support can then be accurately measured with reference to that world price. It also means that these effects are limited to the home country; there is no room for international repercussions. This is clearly unsatisfactory in the case of the CAP; the EC is large enough to influence world markets.

3. Partial equilibrium analysis assumes that the prices of all other goods remain constant. This means that substitutability and complementarity in consumption and production between the good studied and other commodities is ignored. To correct this shortcoming one has to model the interactions between markets for different goods explicitly. The choice of the relevant group of goods is, however, a difficult task, since the chain of substitution can extend from commodities very close to the one studied (e.g., different varieties of wheat) to nonagricultural goods.

4. The preceding discussion also assumes that all demand is final. This is obviously not true for many agricultural products. The demand for those products has to be derived from the cost function of the food industry. Moreover, many commodities use other agricultural products as inputs: beef, for example, requires animal feed. The true degree of protection for beef, therefore, is captured by the effective, rather than the nominal rate.

5. Price-support policies in agriculture, especially in cases like the CAP where a wide range of commodities is covered, can have a considerable effect on total employment and the allocation of capital and labor. This, in turn, affects other sectors of the economy. The size and direction of the effects depend mainly on relative factor intensities and the policies implemented in the other sectors. Such interactions can exert a significant influence on the actual welfare gains or losses from agricultural policies.

6. Because of the range of coverage of policies like the CAP, macroeconomic considerations also enter the picture.

Changes in the price support policies for many commodities can have sizable effects on the external balance of the economy and, consequently, the exchange rate, or the relative price of tradables and nontradables. Either could then shift the supply and demand curves in Chart 2 endogenously.

7. Externalities and market distortions, if present, represent the greatest challenge to the welfare analysis of price-support policies. Even if they are absent from the agricultural sector proper but exist elsewhere, externalities and distortions can affect the calculation of welfare costs and benefits in a variety of ways. Empirical work has shied away from these problems by routinely postulating perfectly competitive structures, full information, and complete markets.

These shortcomings of the simple partial equilibrium model have prompted analytical efforts in several directions. First, to simplify the empirical question at hand and take care of the problem raised in point (1) above, most researchers convert all sorts of price-support instruments into tariff equivalents (nominal or effective, as the case may be). Alternative policy options are then described in terms of changing this notional rate of protection, without specifying how exactly this is to be done. Harling (1983) and Valdes and Zietz (1980) discuss at length the methods of calculating tariff equivalents and the ensuing problems.

Second, "large-country" effects, substitution of agricultural commodities in production and consumption, and backward and forward linkages with other sectors are incorporated in the analysis by applying partial equilibrium techniques in a multicountry multisector framework. This approach is used extensively in evaluating policies such as the CAP, which affect many agricultural commodities simultaneously. Trouble spots (2) through (4) from the previous list are dealt with in this way.

Multicountry multicommodity models differ fundamentally from the simple analysis in Chart 2 in one respect: the world price loses its meaning as a reference point for the measurement of the welfare costs of protection. Since the home country is "large," a change in domestic policies will affect the world price. The effects of the policy must be estimated with respect to what the world price would be, had the policy been absent. The calculation of that hypothetical price requires formulating demand and supply functions for the country(ies) and commodity(ies) involved and solving the system at a notional, unobserved equilibrium. This is called counterfactual analysis.

Counterfactual analysis is necessary for the effects of domestic policies on international trade and other countries to be addressed. Once counterfactual world equilibria have been computed, the resulting prices and trade flows can be compared with the actual ones and the distortions implied by the existing policies can be demonstrated. Moreover, the effects of the policies on the real income of other countries can also be calculated. Multicountry multisector partial equilibrium models that use counterfactual analysis to esti-

mate both domestic and international effects of price support can get quite complicated.

Probably the most advanced model in this category is that of Tyers, used by the World Bank in the 1986 *World Development Report*.<sup>78</sup> It incorporates 7 agricultural commodities and 30 countries or country groups. The intersectoral links are captured by cross-elasticities in both supply and demand. Supply is represented by a mechanism of "partial adjustment" of production to prices (Nerlove, 1958). It models government action explicitly by using "transmission elasticities," which determine what proportion of a world price shock is passed through to domestic producers and consumers, it includes stock-holding behavior endogenously, and it estimates welfare effects on consumers and producers and changes in government budgets and stockholders' profits. Finally, it is dynamic in nature, in the sense that it allows for differences in the short- and long-run effects of a shock or policy change.

Even a model of such sophistication, however, is essentially limited by the constraints of partial equilibrium methodology. Computable general equilibrium (CGE) models make one further step and bring nonagricultural sectors, factor markets, and the macroeconomy into the picture. Thus, the problems raised above in points (5) and (6) are addressed directly in CGE models.

CGE world models are essentially higher dimensional analogs of the traditional two-sector Heckscher-Ohlin international trade model. Each region has a production function with primary and intermediate inputs and demand functions derived from utility maximization. The Armington heterogeneity assumption, which postulates that similar goods from different countries are imperfect substitutes, is usually made to account for the cross-hauling of goods observed in international trade. The countries are constrained by their total factor endowments. The balance of payments, or parts thereof, is modeled explicitly and constrained by an external condition. A global general equilibrium is characterized by a set of international prices for all goods and factors such that (i) all markets clear, (ii) the zero-profit conditions are met in all industries, and (iii) the external accounts of each country satisfy the constraints.<sup>79</sup>

The issues raised earlier in point (7) are not dealt with successfully in either advanced partial equilibrium or general equilibrium analysis. Externalities, in particular, are hard to handle because market prices do not reflect the true social valuations of different activities.

The discussion so far has focused on different ways of measuring the effects that price support policies have on

<sup>78</sup> See Tyers and Anderson (1986a) and also Tyers and Anderson (1987) and (1986b); earlier versions of the same model are used in Anderson and Tyers (1984), Chisholm and Tyers (1985), and Tyers (1985).

<sup>79</sup> The basic structure of CGE models is discussed in detail in Whalley (1984) and (1985b), Ch. 3, and Winters (1987). Whalley (1985a) outlines some of the methodological problems that applied general equilibrium analysis still faces.



domestic welfare, international trade, and the welfare of other countries. Such policies in large countries or regions, however, have other effects as well. One that has attracted considerable attention is the effect on the stability of international commodity prices.

Price instability, especially in agricultural markets, has long been an issue. The conventional view is that policies that insulate domestic markets from international price movements tend to increase world price instability. This happens because if a country does not let its domestic consumption accommodate, for example, a world production shortfall, the consumption of everybody else must fall disproportionately. To ration the reduced world output, world prices must rise by more. This, in turn, causes farmers' incomes to fluctuate. Farmers with utility functions with the usual convexity properties react with aversion to risk in their supply decisions and, in this way, affect the economy as a whole. Moreover, the poorer the country whose commodities are affected the more undesirable these fluctuations are, because farmers there tend to be more numerous and impoverished and because they are more vulnerable to income fluctuations owing to the reduced access to insurance markets.

This view is not completely accurate for two reasons. First, it is unclear whether all price-support measures increase instability or whether they increase it to the same extent. Bale and Lutz (1978 and 1979b) show that some policy instruments have no impact on world price stability while others transfer different degrees of instability from one country to another.<sup>80</sup> Second, world prices in theory can be stabilized even if most countries insulate their markets, as long as countries or private individuals operating on the free market hold big enough stocks. The issue is, ultimately, an empirical one.

To measure empirically how much the insulation of particular domestic markets adds to price instability in the world, the partial or general equilibrium models used need to be modified to take into account price fluctuations. This is done by introducing stochastic supply and demand shocks in the models (see, for example, Tyers and Anderson, 1986a) and observing how the specific policies change the variance of prices.

A final methodological point that ought to be mentioned has to do with the scope of counterfactual equilibrium analysis. There is no hard and fast rule for the choice of the appropriate counterfactual "base case"; it depends on what the specific question addressed is. If the focus is on a cost-benefit analysis of the CAP, then the free trade competitive equilibrium is the obvious choice. If, on the other hand, the objective is an evaluation of an alternative policy

package (such as maintaining unchanged nominal support prices for a certain period of time, or reducing protection of some communities or across the board), then this is the appropriate counterfactual. The first option has the additional advantage of being conceptually simple and familiar. The second is obviously more interesting from a policy-maker's point of view but requires a detailed spelling out of the components of the alternative policy package.<sup>81</sup>

## The Evidence

### Effects of the CAP on EC Members

This section presents a survey of recent empirical literature on the domestic effects of the CAP. Most studies treat the Community as one entity; some, however, provide estimates of the effects on a country-by-country basis. Most provide a breakdown of the total welfare cost into consumer and taxpayer (or government) loss and producer benefit. Table 37 in Appendix I summarizes the evidence from all the existing studies that report results in a comparable form. Also presented and discussed are studies that focus on different aspects of the domestic effects of the CAP or that formulate their questions in a different way. The cost estimates in columns (a) through (d) are all converted into 1980 U.S. dollars.

All but one of the studies presented are multisector models, covering all or most of the CAP commodities. Koester and Schmitz (1982) is the only exception. They examine the effects of the EC Sugar Protocol (a mixed system of price support and quotas) on developing countries, intra-EC transfers, and Community welfare. The welfare costs are calculated with a free trade counterfactual world price as the reference point, which was taken to be equal to 38 percent of the EC support price. This counterfactual world price was arrived at by a series of computations of free trade counterfactual equilibria under different assumptions about demand and supply elasticities in the Community and the rest of the world. No exact information about the elasticities, however, was available and, in addition, the computed counterfactual equilibria were very sensitive to the elasticity values. The welfare calculations, therefore, do not seem very reliable.

Morris (1980) estimates the effects of price support for the main CAP commodities (the exceptions are wine, tobacco, fruit, and vegetables). A serious drawback of this study is that the counterfactual free trade prices do not come out of a demand and supply system but are instead postulated ad hoc. Since these counterfactual prices are not listed in the study, it is impossible to tell a priori whether the paper

<sup>80</sup> The effect of domestic policies on international price stability is also analyzed in Bale and Lutz (1979a), Blandford (1983), and Berck and Schmitz (1984). Koester (1982) compares alternative price support policy packages against their (de)stabilizing properties.

<sup>81</sup> Buckwell and others (1982, Ch. 3), Australia, Bureau of Agricultural Economics (1985, Ch. 6), and Whalley (1985b, Ch. 3) offer a brief discussion of the problems of counterfactual equilibrium analysis.

tends to over- or underestimate the welfare costs.

Thomson and Harvey's (1981) paper models the markets for 16 groups of agricultural commodities. Their interaction is captured by a set of cross-elasticities. The study evaluates the CAP with respect to its stated objectives and does not address the wider social costs. The closest one could come to a measure of overall efficiency is the transfer ratio of 1.77. The transfer ratio is the cost to the economy of an increase in farmers' income by one unit.

A very comprehensive study of agricultural protection in the EC is the one by the Australian Bureau of Agricultural Economics (Australia, Bureau of Agricultural Economics, 1985). It treats the Community as one country, but distinguishes between different commodities, as do Thomson and Harvey, and makes adjustments to account for their interaction. It considers the CAP together with national price-support policies and provides yearly estimates of the costs for the 1971–83 period. In Table 37 in Appendix I estimates are reported for 1978, when, according to the study, the costs of agricultural support peaked, and 1983. Their results imply significant costs from the operation of price-support mechanisms: around 0.3 percent of total GDP for the EC-10, equivalent to roughly one third of Greece's GDP, was wasted in 1983. In per capita terms, this is approximately \$25.

Probably the most often quoted study of the effects of the CAP is the monograph by Buckwell and others (1982). As with the previous two studies, they model explicitly many countries and markets, with the interaction between commodities captured by cross-elasticities. An important advantage of this paper is that it takes into account intra-EC transfers resulting from Community preference schemes, the common financing of the CAP, and MCAs. Their estimate of the consumers' loss is comparable to that of the Bureau of Agricultural Economics, but that of the taxpayers is smaller, possibly because of the inclusion of the aforementioned intra-EC transfers. The total cost estimate, however, is larger than that of the Bureau. The reason for this is probably the fact that Buckwell and others model the structure of the agricultural sector in greater detail and, therefore, are more accurate in their estimation of the producers' benefit.

Tyers (1985) and Tyers and Anderson (1986a, 1986b, and 1987) use different versions of the same model to estimate the costs of the CAP alone and of the CAP plus domestic policies. The basic model is discussed in the first part of this appendix. In comparison to the previous studies, there seem to be several advantages in the analytical framework used by Tyers and Anderson. First, the international policy interactions are better captured, because the degree of disaggregation is higher (24 countries and country groups in the Tyers (1985) paper and 30 in the 1986a Tyers and Anderson paper). Second, government behavior is incorporated in the model and assumed to be different in the short and the long run. Third, stockholding behavior is modeled explicitly.

The estimates presented in the studies are for different years (1980 for the Tyers study and 1980–82 and 1985 for the Tyers and Anderson studies)<sup>82</sup> and country groups (EC-9 to EC-12) and for varying degrees of disaggregation of the rest of the world. In the two earlier studies, the total cost estimate is significantly higher than in any other partial equilibrium study: it is 1.1 percent of the GDP of the EC-9 in 1980 in the Tyers study and 1.3 percent of the GDP of the EC-10 in 1985 in the Tyers and Anderson paper. The implied transfer ratio in the latter study is 1.88. In their 1987 study, however, the authors estimate total costs at only 0.3 percent of the GDP of the EC-12 and the transfer ratio at 1.2. The discrepancy with the earlier studies seems to reflect in part a change in the measurement of the welfare effects. While the model used in this and earlier studies by the same authors is nonlinear, in the earlier studies linear approximations to supply and compensated demand curves were used to measure the welfare effects. The areas that emerge from such approximations are accurate only for small changes in domestic prices—in the case of the EC, however, the price changes were in fact very large. In the 1987 studies, the areas under nonlinear curves were measured, which in some cases resulted in substantially smaller welfare effects. In addition, the 1987 study assumes a much lower degree of transmission of world market price changes to domestic price changes. The long-run transmission elasticities for the EC, for example, range between zero and 0.76 depending on the particular commodity.<sup>83</sup> As a consequence of the higher degree of insulation of prices in the EC and other countries and geographical regions, trade liberalization in the EC has a larger impact on world market prices. This is reflected in the significantly larger increases in agricultural world market prices as a result of trade liberalization in industrial countries in the 1987 study compared with the earlier studies (see below). Consequently, the gains from liberalization, which depend on the counterfactual world market prices, are much smaller.

The studies by Spencer (1985) and Burniaux and Waelbroeck (1985) are general equilibrium models. Spencer has a very simple CGE model with nine countries (eight in the EC, with Belgium and Luxembourg lumped together, and the rest of the world) and two goods (agriculture and non-agriculture) produced with two factors of production. He calculates that 0.9 percent of the GDP of the EC-9 is lost as a result of the CAP.

Burniaux and Waelbroeck use a more sophisticated CGE framework, which includes nine regions and models separately production and consumption in the urban and rural

<sup>82</sup> Note, however, that both in the 1986 and 1987 studies the base period for the estimates was 1980–82. The results reported for 1985 are merely "scaled up" results for 1980–82 and do not take into account the major macroeconomic and supply shocks that occurred between 1980 and 1985.

<sup>83</sup> A value of zero implies no pass-through of changes in the world prices to the domestic prices; a value of one implies complete pass-through.



areas of each (see Burniaux and Waelbroeck, 1985). As in the Tyers and Anderson (1986a) model, different degrees of insulation of the domestic market are captured by price transmission equations. The paper distinguishes between more and less "flexible" regions; the United States and Latin America, for example, are assumed to insulate their domestic markets less than oil exporting countries and Europe.

The Burniaux and Waelbroeck model calculates the long-run effects of a policy change today, subject to growth rate forecasts for the regions under consideration. Dismantling the CAP today (that is, in 1985), according to the model, generates a gain in real income equal to 2.7 percent of GDP of the EC in 1995. This result is somewhat surprising, compared with the other studies presented here, but can be explained by the assumptions fed into the model. Burniaux and Waelbroeck, unlike other studies, assume that international commodity prices, even if nothing else changes, will be decreasing continuously until 1995. Agricultural protection in the EC with variable import levies, which maintain domestic commodity prices unchanged, is obviously bound to look increasingly expensive against this background. Nevertheless, this scenario is not unreasonable, especially if the commodity price trends of the last 30 years continue in the future.

Finally, the results from a recently released OECD study (1987) can be construed to be based on a simple partial equilibrium approach, which implicitly assumes inelastic demand for agricultural products in the EC for estimating costs to the consumers. The expenditures incurred by both the national and the EC authorities on agriculture, on the other hand, are taken in the study to represent the costs to the taxpayer. The OECD study estimates the cost of agricultural policy in the EC to the consumers at about \$28 billion in 1980 prices (or about 1.8 percent of GDP of the EC-9). The total cost (to the consumers and taxpayers) of this policy is estimated at 2.8 percent of GDP; the annual average costs are estimated at ECU 11,437 per holding and ECU 7,465 per agricultural worker during the period 1979–81.<sup>84</sup>

The diversity of the methodologies used makes it difficult to summarize the evidence presented in Table 37. In general, though, the estimates of the welfare costs of the CAP seem to fall into two zones: a "low" one, with net losses ranging from 0.32 percent to 0.55 percent of Community GDP (Morris (1980), Australia, Bureau of Agricultural Economics (1985), Buckwell and others (1982), and Tyers and Anderson (1987)), and a "high" one, with net losses at around 1 percent or more of Community GDP (Tyers (1985), Tyers and Anderson (1986a), Spencer (1985), and Burniaux and Waelbroeck (1985)). The Thomson and Harvey (1981) study also belongs to the latter group by virtue of

their estimate of the transfer ratio, which is comparable to that of Tyers and Anderson (1986a).

Although it is impossible to judge the validity of these figures without some idea of the true costs, it is worth noting that the studies that produce estimates in the high zone use generally superior methodology and a higher level of disaggregation. To the extent that this is a valid criterion for evaluating empirical work, it can be concluded that these studies are probably more accurate in estimating the welfare costs of the CAP.

The remaining part of this section discusses briefly a few studies that focus on different, distributional or country-specific, effects of the CAP and are not included in Table 37. Harling and Thompson (1985) use a partial equilibrium model to estimate the costs of intervention in the poultry industry for, among other countries, the Federal Republic of Germany and the United Kingdom. They find that in 1975–77 the resulting deadweight losses were on the order of \$10.5 million for these two countries together.

Bale and Lutz (1979b and 1981) calculate the costs of price support for wheat, maize, sugar, and beef in selected countries. They use a very simple partial equilibrium model and report a net welfare loss of \$737.3 million for France, \$1,112.4 million for the Federal Republic of Germany, and \$112.4 million for the United Kingdom.

The paper by Buckwell and others provides estimates of the welfare costs by country. They are summarized in Table 38. The transfer ratio, which can be thought of as a broad measure of policy efficiency, is 1.50 for the Community as a whole. It is the highest in the United Kingdom (2.07), Italy (1.87), and the Federal Republic of Germany (1.8). It is less than unity in the Netherlands, Ireland, and Denmark, indicating that these countries benefit from the intercountry redistribution of income caused by the CAP (see Buckwell and others (1982); also, Koester and Tangermann (1986)).

This ranking of the gainers from the CAP is similar to the one in Spencer (1986). He uses a general equilibrium model to evaluate which countries would do better outside the CAP, and by how much. It turns out that Ireland would be the only clear loser, with Denmark gaining the least. The only notable difference between Buckwell and others and Spencer is the Netherlands: in the former study the less-than-unity transfer ratio indicates that the country is benefiting, whereas in the latter the Netherlands appears to be losing from the operation of the CAP.

Greece also appears to gain a very small amount, around ECU 5–10 million a year, from participating in the CAP (see Georgakopoulos (1986) and Georgakopoulos and Paschos (1985)). This result, however, should be interpreted with care, since it is not derived from a full counterfactual analysis.

Breckling, Thorpe, and Stoeckel (1987) use a simple general equilibrium model to appraise the economy-wide effects of the CAP for four EC members: France, the Federal Republic of Germany, Italy, and the United Kingdom. They

<sup>84</sup> These are the "gross" costs of the CAP and not comparable with the "net" costs, or deadweight losses, reported in Table 37.

conclude that the costs of agricultural price support extend beyond the traditional welfare losses. Specifically, for all countries taken together, manufacturing industries (excluding food processing) lose between 1.1 and 2.5 percent of potential gross output and between 4.4 and 6.2 percent of exports, and total employment is reduced by around 1 percent (or 860,000 jobs). Unemployment increases universally in these countries as nonagricultural sectors are relatively intensive employers of labor. The job loss is more in the United Kingdom and the Federal Republic of Germany followed by Italy and France. This is the result of slower growth of labor-intensive nonagricultural sectors in the former countries. The results, however, suggest that despite the emerging unemployment, France is a net beneficiary of the CAP in view of its large rural sector and EC transfers under the applicable common policy. These results are broadly confirmed in a later study by Stoeckel and Breckling (1988), which uses the same model. The authors find that national and supranational protection of the agricultural sector in the four countries under investigation, reduce real aggregate income by 1.5 percent and cause a loss of about four million jobs.

Despite the budgetary and welfare burden of the CAP, the agricultural lobby has resisted attempts to liberalize and is, instead, stepping up pressure to reinforce the CAP (Koester (1985), Gerken (1986), and von Witzke (1986)). This movement away from liberalization is apparently accelerated by demands for more equal distribution of the CAP benefits between member states. Josling (1979) discusses the CAP in the light of the expansion of the EC in southern Europe and concludes that the wider range of commodities and the shifting political balance within the Community will increase the domestic costs, exacerbate the budgetary problems, and amplify the international effects of agricultural protection. In the same vein, Koester (1977) argues that as long as it is possible for member countries to supranationalize costs of national agricultural support, the prospects for a CAP reform are poor. This argument may be questionable at a time of acute budgetary crisis.

## Effects of the CAP on International Trade

This section discusses the evidence on the effects the CAP has on the level of prices and the volume and pattern of world trade in agricultural commodities. Since the policies that apply to different products vary widely, the estimated effects for each of the most important commodities covered by the CAP are presented separately. These commodities are wheat, coarse grains (barley, maize, rye, oats, millet, and sorghum), rice, ruminant meat (beef and veal), nonruminant meat (pork, poultry, etc.), sugar, and dairy products. Table 43 presents the estimated effects of a hypothetical abolition of the CAP on the international prices of the above commodities. Each of the studies reviewed calculates

a counterfactual world trade equilibrium with a completely liberalized EC market for the commodities in question and then compares the resulting counterfactual prices with the actual world prices.

The estimates show that abolition of the CAP would significantly increase the world prices of all the commodities examined. In other words, the CAP exerts a powerful downward pressure on the actual price level. Roughly speaking, the effect is stronger on dairy products, grains, and ruminant meat and weaker on sugar and rice. This result is to be expected, since the former category of products is afforded greater effective protection than the latter (see Sampson and Yeats (1977), Koester and Tangermann (1986)).

All the estimates reported in Table 43 come from partial equilibrium models. There are considerable differences between the estimated price effects for each commodity, which can be, to a large extent, traced back to the differences in the methodology and the data used in each study. First of all, models that cover only a few commodities or do not take into account market interaction tend to predict higher counterfactual prices and, therefore, overestimate the effects on world markets of price support in the CAP. If only a few isolated markets are liberalized, then the pressure from the other, still protected, markets will spill over via commodity substitution, and the observed effects will be amplified. The first four studies listed in Table 43 share this characteristic. The Koester and Valdes (1984) paper in particular, although it examines many products, does not take into account cross-effects and uses, essentially, a single-commodity approach.<sup>85</sup>

A second element that accounts for differences between estimated effects, even if the methodology is similar, is the data used. This explains partially why the results of the four other papers (Anderson and Tyers (1984), Tyers and Anderson (1986a and 1987), and Matthews (1985b)), which are all multicommodity models and examine the effects of a generalized liberalization on individual commodity prices, are so diverse. Anderson and Tyers (1984) probably overestimate the degree of protection in the Community by using the official intervention prices as the appropriate domestic market prices (Koester and Tangermann (1986)). Owing to the existing surplus stocks, however, EC market prices are generally lower than the intervention prices (see the information provided in Commission of the European Communities (1987a, Statistical Information)). Matthews, on the other hand, underestimates the degree of protection in the Community, because he uses the EC c.i.f. price as the

<sup>85</sup> Tyers (1985) and Matthews (1985b) estimate the effects of liberalization in a multicommodity model with and without cross-effects. In both studies the models without cross-effects produce estimates 20 to 100 percent higher than the models with cross-effects. This difference is most noticeable in coarse grains, wheat, and nonruminant meat, where the removal of channels for market interaction roughly doubles the calculated effects of liberalization.

appropriate world price. As the Community is a net exporter of many of these commodities, however, the f.o.b. price or the price in major foreign ports should be used.

A third factor that affects crucially the outcome of counterfactual experiments is the values of the parameters used. For example, the higher the domestic demand elasticity is, the stronger the domestic reaction to liberalization and the larger the final effect on the world price will be. Tyers (1985) and Anderson and Tyers (1984) use EC demand elasticities between  $-0.5$  and  $-0.7$  (Tyers (1985)), whereas Matthews postulates a value of  $-0.4$  for all commodities (Matthews (1985b)). The former range of values is based on a more detailed survey of the relevant empirical literature. Also, as mentioned above, the difference in "transmission elasticities" between the more recent Tyers and Anderson studies influences the results.

Finally, the last significant cause of deviations between the estimates of different models is the varying degree of country and commodity coverage and differences in the base period. The Tyers and Anderson papers (1986a and 1987) are by far the most detailed in that respect, modeling 7 commodity and 30 country groups. Unfortunately it is impossible to tell a priori whether a greater degree of disaggregation tends to generate larger or smaller effects.

The OECD (1987) has produced a comprehensive partial equilibrium study on the effects of agricultural protection in the world. Although the emphasis is on multilateral liberalization, they report some estimates of the effect on world prices of a unilateral liberalization in the Community. Their counterfactual, however, is not the free trade equilibrium but a 10 percent across-the-board reduction in nominal protection of all commodities. They calculate that this partial liberalization in the EC increases the world prices of most commodities from 0.55 percent, in the case of sugar, to 2.81 percent, in the case of milk. In the case of grains, however, prices actually fall a little following the hypothetical CAP reform, owing to decreased demand for grains by livestock producers.

The calculated counterfactual prices are important, first, because they give some idea of the degree of distortion in world agricultural markets that is due to the CAP and, second, because they provide the basis for the estimation of the effects of liberalization on the pattern and volume of world trade. Changes in the pattern and volume of trade, of course, have little importance in and of themselves. Calculating them, however, is a necessary step in assessing the effects the CAP has on the real income of Europe's trading partners. For that reason we present and discuss some of the empirical work on this issue very briefly.

Table 44 highlights the main results. Abolition of the CAP increases total commodity trade by a considerable amount. This is caused basically by a large increase in EC net imports, prompted by lower consumer and higher producer prices. The effect is stronger in the most heavily protected sectors, such as wheat, grains, and dairy products.

The reported effects would be much larger if they were expressed in value, rather than volume, terms.

The results of studies cited in Table 44 are influenced by the estimated post-liberalization counterfactual prices and the coverage and grouping of countries. Koester (1982), for example, includes in the developed countries group all the centrally planned economies, which form a separate group in Tyers and Anderson (1986a). The only surprising result, which cannot be explained by these factors, is the negative change in EC net imports of wheat that Tyers and Anderson report. Given that the Community is a net exporter of wheat, this means that abolishing the CAP will lead to an increase in net wheat exports. Unfortunately the authors do not comment on this counterintuitive conclusion.

The net trade effects of the CAP on other trading partners are also discussed in other studies, which are not comparable to the ones reported in Table 44 because in those, authors conduct a different counterfactual experiment, or use a different taxonomy for reporting their quantitative results, or do not provide quantitative results at all. Sarris (1983) calculates the effects of EC enlargement in southern Europe on international trade in fruit and vegetables. He estimates that including Greece, Spain, and Portugal under the CAP umbrella increases the value of net imports (or reduces the value of net exports) of the other major producing countries by approximately \$116.6 million (in 1980 prices). Tangermann (1978 and 1981) discusses the possible effects of reforming the CAP on the trade flows between developed and less developed countries. He concludes that, since the CAP protects mostly temperate products, EC imports from other temperate/developed countries will increase as a result of reducing price support. The effect on trade with developing countries, however, is ambiguous. The producers of such commodities there will have an incentive to increase their production but, on the other hand, they will also have to compete with other exporters. The final outcome depends crucially on the supply elasticities. Finally, Mackel and Marsch (1984) focus on, among other things, the effect of the CAP on trade in commodities that are not protected in the EC. They argue that the CAP has increased imports of substitute products to the EC, like manioc and soya and that, therefore, a liberalization will harm producers of such commodities.

Empirical research on the impact of the CAP on international commodity trade, far from being in unequivocal agreement, has reached some common conclusions regarding at least the direction of the effects. First, the CAP has a significant depressing effect on world prices. Second, as a result of this, trade flows are severely distorted: EC exports are artificially boosted at the expense of net exports of other countries. Third, this distortion keeps the volume of world trade at a lower level than it would otherwise be. Fourth, these effects are generally more significant for the products that are heavily protected in the Community, such as wheat, coarse grains, ruminant meat, and dairy products.



## Effects of the CAP on the Welfare of Non-EC Countries

The influence the CAP exerts on international trade means that the real incomes of all trading partners are eventually affected. The conventional view, popular with Community officials, is that a unilateral liberalization in the EC will benefit the exporters and harm the importers of temperate zone products by increasing their prices. Consequently, given that most developing countries import temperate zone commodities, the CAP actually constitutes a transfer of income from EC consumers and taxpayers to poor countries via cheaper international food prices. Furthermore, the concessionary character of the Lomé Convention means that a liberalization, which would imply an abolition of those agreements as well, would be even more detrimental to the developing countries. The data in Table 45 seem to support this view. The table presents the effects that a hypothetical complete liberalization has on the welfare of two broad groups: the non-EC developed countries and the developing countries.

The models reviewed in Table 45 are all partial equilibrium, and the degree of commodity and country coverage varies, but two facts stand out. First, the size of the total effect on each of the two country groups is not large compared to GDP or total export earnings. Second, developing countries as a group stand to lose from an abolition of the CAP, while the effect on developed countries is ambiguous.

Differences in the estimated size of the effects can be generally traced back to commodity coverage or the data used. The figures reported by Koester (1982) and Koester and Schmitz (1982) are expectedly lower than the rest, since these studies cover only cereals and sugar, respectively. Therefore, although the estimated effect on the world price of the individual commodities may be higher, as discussed in the previous section, the total welfare effect is small. Matthews (1985b) also reports a small estimated loss for the developing countries for two reasons. One, which was mentioned earlier, because he underestimates the degree of protection in the Community. Two, because he uses smaller domestic supply elasticities than other studies. The higher the supply elasticity assumed for the developing countries, the stronger is the supply response to increasing world prices and the more likely is the realization of gains from increased exports. Matthews (1985b) uses a supply elasticity of 0.4 for all countries, whereas Koester (1982), Anderson and Tyers (1984), and Tyers (1985) use elasticities in the neighborhood of unity. Extensive empirical research has shown that long-run supply elasticities in developing countries vary widely according to the specific product but are generally rather low, fluctuating between 0.1 and 0.3 for grains and 0.2 and 0.5 for rice (see Bale and Lutz (1979b), Scandizzo and Bruce (1980), and the references therein).

Anderson and Tyers (1984) conduct a different counterfactual experiment. They calculate the impact of a 2 percent

annual reduction in EC support prices from 1981 to 1990. Their results are difficult to interpret because, although the final effect of the phased reduction of the support prices will be significant, it is unclear how close it will be to that of a complete liberalization.

Tyers and Anderson (1986a and 1987) have the highest degree of disaggregation, and the most detailed model among the ones in the table, and report in both studies the highest welfare loss for developing countries from abolishing the CAP.<sup>86</sup> In their 1986 study, Tyers and Anderson found that even non-EC developed countries lose because the increase in grain prices as a result of liberalization diminishes the welfare of producers of livestock as they have to pay higher input prices.

Table 45 may lead one to believe that, no matter what the sign is for each group, the effect of the CAP is essentially small. Reporting only net effects for two large country groups, however, conceals the distribution of gains or losses among individual countries. The information that can be pieced together about this is quite interesting. First of all, the small net gain (or the net loss) in the developed countries group is entirely due to the heavy losses of Japan. The rest of the countries in the group all register gains or very small losses (see Tyers (1985), and Tyers and Anderson (1986a)). Second, the distribution of the effect within the developing country group is also very varied, depending basically on whether the country is a net exporter or importer of temperate zone commodities. For some of the countries, the gains or losses are significant. Argentina, for example, appears to gain around \$200 million a year, while Korea and Pakistan each lose \$300 million (Tyers and Anderson (1986a)) from a liberalization of the EC agriculture. Moreover, if liberalization implies abolition of the Lomé Convention it is possible that the developing country signatories will lose even more than the rest of the group. Given, however, that agricultural commodities and, in particular, temperate zone products are a very small portion of the goods that get preferential treatment under the convention, the effects of abolishing the Lomé agreements is likely to be small compared with the effect of a CAP liberalization.

The evidence supporting the conventional view that most developing countries actually benefit from the operation of the CAP tends to be discounted by some researchers. They argue that the fact that developing countries are net importers of temperate zone commodities is due to protectionist policies such as the CAP in developed countries, which depress international prices and make agricultural exports unprofitable. Abolishing such policies, therefore, may imply costs for developing countries in the short run, but in the long run increased prices will stimulate agricultural production and exports, the pattern of trade will change, and

<sup>86</sup> In line with the estimated larger price effects of liberalization, the authors report a higher loss to developing countries in their more recent study.

developing countries will realize important gains. Counterfactual analysis, which uses econometrically estimated supply elasticities, fails to capture this potential "switching" effect and, consequently, measures only the short-run losses. This argument is very appealing to the proponents of unilateral liberalization, who also point out that it is only under the CAP regime that the Community has turned into a net exporter of many temperate commodities (Australia, Bureau of Agricultural Economics (1985)). It has, however, two important drawbacks. First, the lack of reliable long-run supply elasticity estimates makes it impossible to measure the potential switching effect accurately. Second, it is not supported by the existing evidence on agricultural policies in developing countries. If they actually believed in the harmful effects of the present low level of international prices and in their dynamic comparative advantage as commodity producers, they would subsidize agriculture to stimulate domestic production. Many developing countries, however, especially in Africa, actually tax agriculture (Koester and Tangermann (1986)).

Another argument that has been voiced against the estimates in Table 45 has to do with the limitations of the partial equilibrium methodology. A unilateral liberalization in the Community will affect nonagricultural sectors and factor markets and have repercussions on commodity trade. To capture these secondary effects, a general equilibrium model must be used.

Burniaux and Waelbroeck (1985) use a CGE to calculate how a liberalization of trade in agricultural commodities in the Community in 1985 would affect the welfare of developing countries in 1995; the results are quite striking. They estimate that total real income of the developing countries would be higher by 2.9 percent if the CAP were abolished. This is explained by the strong assumption that, even with no change in the CAP, foreign exchange shortages in developing countries will oblige them to rely more and more on agricultural exports. Thus the switching occurs even with no policy change in the Community. It is obvious then that an abolition of the CAP, which raises world prices, benefits the developing countries.

Loo and Tower (1988) use a four-sector general equilibrium model, which they calibrate for six typical developing countries, to investigate the effects of a 10 percent increase in agricultural prices on world markets assumed to result from trade liberalization in industrial countries. They find that developing countries would gain about \$26 billion in 1985 prices as a result of the assumed increase in world market prices for agricultural commodities.<sup>87</sup> This gain could be split between the developing and industrial countries in various ways. With developing country real income unchanged, the benefit to the industrial countries from agri-

cultural liberalization in terms of a reduction in the amount of aid they need to supply would amount to a real income gain of over \$16 billion. Alternatively, the developing countries could reduce their external public debt by 2.8 percent on average, with reductions for the poorest countries of up to 4.8 percent.

These results basically reflect three effects of higher agricultural world market prices on developing countries. First, there is a change in the terms of trade, which affects real incomes. This effect is positive for countries that are net exporters of agricultural products but negative for others that are net importers. Second, there is a gain in efficiency for most developing countries as resources are shifted from relatively inefficient nonagricultural sectors to agriculture. Third, as a result of resource allocation in favor of agriculture, there is an increase in government tax revenue (which allows a reduction in average tax rates) since many developing countries tax agriculture and subsidize certain nonagricultural sectors. The paper by Loo and Tower suggests that the second and third effects may well dominate any terms-of-trade losses that developing countries may incur as a result of a liberalization of agricultural trade in industrial countries.

Matthews (1985a) makes an additional argument in favor of substantial gains by developing countries from a unilateral liberalization in the EC. If, for example, EC real income rose as a result of a more efficient allocation of resources after a liberalization, the developing countries would gain indirectly from the increased demand for their exports by the Community and by other developed countries whose agricultural export earnings would also have risen. This argument is convincing in qualitative terms. Many past studies do not take account of these secondary effects on global welfare and, therefore, probably underestimate the gains from liberalization. It is far from clear, however, that these secondary effects would be quantitatively significant.

The empirical literature surveyed in this section seems to point to a few unambiguous conclusions. First, agricultural price support in the Community is not necessarily harmful to all, or even most, non-EC countries. A unilateral liberalization would benefit some of Europe's trading partners and harm others. In particular, current net importers of temperate zone commodities would lose, whereas current or potential net exporters would gain. Since most developing countries are current net importers, they stand to lose as a group from an abolition of the CAP, at least in the short run. The important issue is who will be able to adjust domestic production and consumption patterns so as to take advantage of the higher world prices in the longer run.

Second, although the size of the effect on broad groups of countries is small, the distribution of gains and losses is far from uniform. Countries that are heavily dependent on temperate zone commodity imports because of climate and geography (e.g., Japan) or because they are poor appear to benefit significantly from the operation of the CAP.

<sup>87</sup> To assess the effects of the CAP alone, the results reported by Loo and Tower could be scaled using estimates of the effects of the CAP on agricultural world market prices provided in Table 43.



Finally, the above results should be interpreted with some caution. It is important to keep in mind that the gains from unilateral liberalization predicted with partial equilibrium models probably have some degree of downward bias built in, because they do not take into account secondary repercussions in nonagricultural sectors.

## Effects of the CAP on International Price Stability

Conventional wisdom holds that countries or regions that insulate their domestic markets increase world price instability. As discussed in the theoretical part of this appendix, this is not necessarily true. The question is essentially an empirical one. Empirical research on the effects of the CAP on price stability has given an affirmative answer: all the studies reviewed here agree that the CAP exerts a significant destabilizing influence on world commodity prices. Table 46 summarizes some of the evidence.

The impact of policies on price stability is estimated with the help of counterfactual analysis. A measure of variability is defined first and then the price variability at the counterfactual non-CAP equilibrium is calculated and compared with actual price variability. Most studies introduce random supply and demand shocks, calculate the corresponding counterfactual equilibria, and then use either the standard deviation or the coefficient of variation of the resulting distribution of prices to measure variability.<sup>88</sup> Table 46 presents the calculated share of world price variability owing to the CAP; in other words, the decrease in variability that would obtain if the CAP were abolished. The destabilizing effect is strongest in the wheat, coarse grains, and dairy products sectors.

Comparing the EC agricultural policies with price-support schemes in other countries reveals that the CAP is the most important destabilizing factor in the world markets. Sarris and Freebairn (1983) estimate that the CAP alone accounts for more than half of the excess variability of the price of wheat over its global free trade level. Blandford (1983) calculates "transmission coefficients" that show the extent to which changes in trade rather than in domestic consumption are used to stabilize the domestic market and concludes that the Community transmits a larger absolute amount of domestic variability in grain to the world market than any other group of countries. Of all the ways in which price support can affect world price stability mentioned earlier, two are most important for the destabilizing effect of the CAP. First, the CAP relies heavily on variable tariffs,

which not only protect the domestic agricultural sector but also insulate domestic consumers from world price variations (Matthews (1985b)). Second, protection reduces the incentive for private stockbuilding, which implies wider price fluctuations. The latter effect could be avoided by government-sponsored stockpiling. Koester, however, finds evidence that in some years EC stocks increased when world market prices were extremely high, thereby actually amplifying world price variability (Koester (1982)).

The last half of this section discussed briefly why price stability is considered important from a welfare point of view, especially for developing countries. Unfortunately, there are no empirical estimates of the welfare losses caused by the destabilizing effects of the CAP. Given the size of the effects, though, it may well be the case that a liberalization would benefit Europe's trading partners significantly by reducing world price variability.

## Concluding Remarks

This appendix has been concerned with two different but related aspects of the CAP: the domestic effects on the welfare of EC members, and the effects on international commodity trade and, consequently, on the welfare of the rest of the world.

Recent empirical literature that has been surveyed addresses these two issues by means of various tools, ranging from single-sector partial equilibrium models to general equilibrium models of the global economy. The differences in methodology, data used, country and commodity coverage, and degree of disaggregation are considerable, and so are the differences in the quantitative estimates. Therefore, if one is to put the reported results in perspective and compare them, it is necessary to have a good understanding of the theoretical premises and the modeling details of each study.

Each approach has its relative merits. The attraction of partial equilibrium models is their simplicity, which means that greater effort can be devoted to collecting data and capturing the peculiarities of the sector(s) represented. On the other hand, intersectoral links are ignored, which in turn means that not all of the effects of agricultural policies are covered. General equilibrium models are more comprehensive in that sense, but they are more demanding both analytically and in terms of data requirements. Overall, however, general equilibrium models are preferable in that they reveal the effects of agricultural price support on other sectors and on the macroeconomy. These effects are both important for policy purposes and, in the case of the CAP, significant in size. Without a general equilibrium model it is difficult to capture the secondary repercussions that liberalization has on the world economy via factor and other product markets. Ignoring these effects may cause systematic underestimation of the gains from liberalization.

<sup>88</sup> The choice of the measure is important: the standard deviation, for example, depends on the level of the mean (in this case, the price level) and, therefore, even if prices remain equally stable after liberalization, the standard deviation will be different. Koester (1982, pp. 53–54), discusses at length the different measures of variability. It turns out that even the coefficient of variation is not unbiased. Koester suggests correcting the coefficient of variation by the explanatory power of the trend regression to obtain a better measure of variability.

Empirical research on the domestic effects of the CAP has reached some unequivocal conclusions. First, the CAP redistributes large amounts of income to farmers, primarily from consumers and secondarily from taxpayers. This transfer is economically inefficient, in that it incurs a deadweight loss. The mean estimate of this loss is around 1 percent of the Community's GDP.

Second, the distribution of this loss among countries is not uniform. Most countries, however, stand to lose. The heaviest loser appears to be the United Kingdom, followed by Italy and the Federal Republic of Germany. France probably also registers small losses. The clear gainer is Ireland. The evidence on Denmark and the Netherlands is ambiguous.

Third, other than the deadweight loss that the whole economy suffers, other sectors incur costs because of the CAP as well. In particular, subsidizing agricultural production means discriminating against industry and services, diverting resources away from them and reducing their exports. This kind of cost has not attracted enough attention, mainly because it requires general equilibrium modeling. Quantification of intersectoral effects is, therefore, an important area for future research.

The economy-wide and sectoral losses are by no means the only costs of the CAP. Agricultural price support, especially of such magnitude, generates wasteful rent-seeking and lobbying and distorts investment. These costs are difficult to estimate, but they mean that the traditional welfare calculations, even if they include intersectoral repercussions, underestimate the true social costs of operating the CAP.

With regard to the international effects of the CAP, empirical research has come to some interesting conclusions. By encouraging domestic production and raising consumer prices, especially in products with low income elasticity, the CAP has artificially reduced EC consumption and boosted production, turning Europe into a net exporter of most temperate zone commodities. This increase in the EC commodity surplus depresses and destabilizes world prices and makes production in other countries less profitable. The pattern of world trade is, in this way, severely distorted. This effect is more evident in the sectors that are relatively more heavily protected, like wheat, coarse grains, ruminant meat and dairy products.

The distortionary effects of the CAP affect the welfare of

the Community's trading partners. Generally speaking, net exporters of temperate zone commodities lose, while net importers gain. Since most developing countries are net importers, less developed countries as a group appear to benefit from the operation of the CAP, at least in the short run, through an improvement in their terms of trade.

This result, although it is confirmed by most existing studies, should be treated with caution. First of all, it conceals the distribution of losses and gains across countries, which is far from uniform. Second, it is derived mostly from partial equilibrium models, which ignore secondary repercussions on welfare via the nonagricultural markets; the available general equilibrium studies show that ignoring these repercussions leads to systematic underestimation of the costs of the distortion. Third, it may be relevant only in the short run; if many developing countries were able to take advantage of higher commodity prices and switch from being net importers to net exporters, the result would prove incorrect over the longer run. Fourth, it ignores the cost of increased price instability, which is probably more detrimental to poor than to rich countries.

It is hard to express these qualifications quantitatively; however, even if the majority of developing countries actually gained from the CAP this gain would be very small compared with the welfare losses in the EC. It would be easy for the Community to compensate the losers from a unilateral liberalization and still realize substantial benefits.<sup>89</sup> From a world welfare point of view, of course, there is an even better alternative than a unilateral liberalization-cum-compensation scheme: that of a multilateral reduction of protection in agricultural markets. All existing evidence strongly suggests that moves toward freer trade that involve more, rather than fewer, trading partners would spread the benefits more uniformly. In other words, the optimal response of the losers from a unilateral liberalization is to liberalize their markets as well.<sup>90</sup>

<sup>89</sup> It is worth noting that, even by the most pessimistic estimate, the losses of the developing countries from a unilateral liberalization in the EC are only around 70 percent of the official development assistance actually disbursed in 1985 by the seven largest EC members, excluding Greece, Ireland, and Luxembourg (in 1980 U.S. dollars; see World Bank (1986, Statistical Appendix)).

<sup>90</sup> OECD (1982) discusses the issue of multilateral liberalization in detail. There is also a large body of empirical evidence on this: Chisholm and Tyers (1985), Tyers and Anderson (1986a), Whalley (1984), Whalley (1985b), and World Bank (1986, and the references therein).

# Appendix IV

## Economic Costs of the CAP:

### An Illustrative Exercise for the Federal Republic of Germany

There is by now a sizable body of empirical literature on the effects of the CAP on the domestic economies of member countries.<sup>91</sup> Most of this literature is based on models of the partial equilibrium type—that is, models that focus on the markets for agricultural products and assume that prices and quantities of other goods and services are unaffected by changes in agricultural policy. Fewer attempts have been made at estimating the effects of the CAP by means of so-called computable general equilibrium models, which take account of intersectoral linkages. Those computable general equilibrium experiments that have been carried out, however, indicate that intersectoral dependencies are important, and that without taking explicit account of them it is not possible to calculate the full effect of agricultural policies on macroeconomic variables, such as growth, employment, and prices.

The analysis in this appendix is based on a simple computable general equilibrium model for the Federal Republic of Germany. A change in protection of agricultural production in the EC is simulated and the domestic effects on the German economy are explored.

#### The Model

The model that serves as the basis for the simulation is a “small” computable general equilibrium model, which closely follows Dixon and others (1982). It is small in the sense that only four productive sectors are represented: agriculture (which includes food processing), industry, traded services, and nontraded services. Each sector is assumed to produce one good. Final demands and demands for intermediate inputs are satisfied by a combination of imports and domestic production. The model distinguishes three types of imports (agricultural goods, industrial goods, and traded services); each constitutes an imperfect substitute for the corresponding type of domestic production. There are four kinds of final demand (investment, government consumption, private consumption, and exports) and three

types of primary inputs (labor, capital, and land). All tariff and subsidy changes in agriculture are assumed to apply at the EC border and all EC countries are assumed to act in an identical way. The model assumes that each sector’s capital stock, as well as real wages, the external position, and the nominal exchange rate, are unaffected by the simulated change in policies.<sup>92</sup>

The aggregation level of the model is reflected in the following input-output table. Table 49 describes which sources satisfy each type of demand in the base period:

In the model, changes of input-output structures are represented by equations for input demand, final demand, supplier behavior, and market equilibrium. These equations are discussed in the following paragraphs.

#### Input Demand

Producers are assumed to minimize the cost of production, and to be confronted with a two-level production function. The first level imposes constant returns to scale and Leontieff complementarity between different types of intermediate inputs and between intermediate and primary inputs. The second level allows for constant elasticity (CES) substitution between imported and domestically produced intermediate inputs and between different types of primary factors. The model describes the solution to the optimization problem in a set of equations for producers’ factor demand. Thus, in a given sector (sector  $j$ ) demand for both domestically produced and imported intermediate inputs depends on the activity level  $[Z(j)]$  and the relative prices of imports and domestic production:

$$\begin{aligned} INTERINPUT(DOM, i, j) &= F1[Z(j), P(DOM, i), P(IMP, i)]; \\ i &= 1, 2, 3; \\ j &= 1, 2, 3, 4. \end{aligned} \quad (1)$$

<sup>91</sup> See Appendix III for a survey of existing studies.

<sup>92</sup> The simulation results reported later in the appendix depend to a significant extent on the presence of classical unemployment in the economy, which seems to be the case for most European countries.

**Table 49. Input-Output Structure for the Base Year<sup>1</sup>**

Delivery from \ Delivery to	Sector 1: Agriculture	Sector 2: Industry	Sector 3: Traded Services	Sector 4: Nontraded Services	Investment	Households	Government	Exports
Sector 1: Agriculture								
Sector 2: Industry	<i>INTERINPUT</i>	<i>(DOM)</i>			<i>INV(DOM)</i>	<i>CONS(DOM)</i>	<i>GOV(DOM)</i>	<i>EX</i>
Sector 3: Traded services								
Sector 4: Nontraded services								
Import type 1: Imports of agricultural goods								
Import type 2: Imports of industrial goods	<i>INTERINPUT</i>	<i>(IMP)</i>			<i>INV(IMP)</i>	<i>CONS(IMP)</i>		
Import type 3: Imports of traded services								
Labor	<i>LAB</i>							
Capital	<i>CAP</i>							
Land	<i>LAND</i>							
Total	<i>Z</i>				<i>INV(TOTAL)</i>	<i>CONS(TOTAL)</i>		

<sup>1</sup> The capitalized names in the table represent variables of the computable general equilibrium model. The notation is fully documented in Table 52.

$$INTERINPUT(IMP, i, j) = F2[Z(j), P(DOM, i), P(IMP, i)]; \\ i = 1, 2, 3; j = 1, 2, 3. \quad (2)$$

$$INTERINPUT(4, j) = F3[Z(j)]; j = 1, 2, 3, 4. \quad (3)$$

Here equation (3) states that input-demand for nontraded services (which are produced by sector 4) only depends on activity levels in the demanding industries, as there are no imports to substitute for domestic deliveries.

The equations for primary input-demand state that each sector's demand is determined by its activity level and the relative prices of labor, capital, and land:

$$LAB(j) = F4[Z(j), P(LAB), P(CAP), P(LAND)]; \\ j = 1, \dots, 4 \quad (4)$$

$$CAP(j) = F5[Z(j), P(LAB), P(CAP), P(LAND)]; \\ j = 1, \dots, 4 \quad (5)$$

$$LAND(j) = F6[Z(j), P(LAB), P(CAP), P(LAND)]; \\ j = 1.^{93} \quad (6)$$

<sup>93</sup> Note that only agriculture (sector 1) uses land as a factor of production.

## Final Domestic Demand

## Investment

By assumption, the simulated policy shock leaves the share of aggregate real investment in real domestic absorption unchanged, but the model allows for substitution between imports and domestically produced investment goods, when relative prices change:

$$INV(DOM, i) = F7[INV(TOTAL), P(DOM, i), P(IMP, i)]; \\ i = 1, \dots, 4 \quad (7)$$

$$INV(IMP, i) = F8[INV(TOTAL), P(DOM, i), P(IMP, i)]; \\ i = 1, \dots, 3 \quad (8)$$

$$INV(TOTAL) = F9(ABS) \quad (9)$$

## Household Consumption

Consumers are assumed to maximize their utility by substituting between different goods in response to relative price changes (in a linear expenditure system). The model fixes the share of total consumption, however, in real domestic absorption:



$$CONS(DOM, i) = F10[CONS(TOTAL), P(DOM, 1), P(DOM, 2), P(DOM, 3), P(DOM, 4), P(IMP, 1), P(IMP, 2), P(IMP, 3)];$$

$$i = 1, \dots, 4 \quad (10)$$

$$CONS(IMP, i) = F11[CONS(TOTAL), P(DOM, 1), P(DOM, 2), P(DOM, 3), P(DOM, 4), P(IMP, 1), P(IMP, 2), P(IMP, 3)];$$

$$i = 1, 2, 3 \quad (11)$$

$$CONS(TOTAL) = F12(ABS) \quad (12)$$

### Government Consumption

Like private consumption, government consumption is assumed to maintain its share in real domestic absorption. Since government services are solely provided by the “non-traded services sector” (sector 4),<sup>94</sup> this relationship can be expressed as follows:

$$GOV(DOM, 4) = F13(ABS) \quad (13)$$

### Domestic Supply

A constant-returns-to-scale technology is assumed for all productive sectors. Marginal costs of production increase with output, however, since the supply of two of the primary factors (capital and land) is fixed. The individual producer chooses the output level that equates marginal cost with output price:

$$P(DOM, i) = F16[P(DOM, j), P(IMP, w), P(LAB), P(CAP), P(LAND)]; j = 1, \dots, 4$$

$$\text{but } j \neq i, w = 1, \dots, 3; i = 1, \dots, 4 \quad (14)$$

Here,  $F16$  is the marginal cost of production.

### Domestic Prices and World Market Prices

The markups in foreign trade (for transport, wholesale, retail services, etc.) are assumed to remain constant in the wake of the simulated policy change. Similarly the nominal exchange rate is assumed to be unaffected. Thus, the relationship between world market prices (in foreign currency) and domestic prices of traded goods only changes if the duty ratio (defined as 1 plus the ad valorem rate of import protection) or the subsidy ratio (defined as 1 plus the ad valorem rate of export protection) moves:

$$P(DOM, i) = \frac{FCP(EX, i) * XRATE * SUBSIDYRATIO(i)}{1/MARKUP}; i = 1, \dots, 3 \quad (15)$$

<sup>94</sup> Table 48 has a “government sector” which creates the goods used by government. This sector is contained in the nontraded services sector of the model.

$$P(IMP, i) = \frac{FCP(IMP, i) * XRATE * DUTYRATIO(i)}{MARKUP}; i = 1, \dots, 3 \quad (16)$$

In the following experiment it was assumed that the subsidy and duty ratios in the agricultural sector would decline by 20 percent as a result of liberalization of the CAP.<sup>95</sup> In line with the studies surveyed in Appendix III (see also Table 43), it was further assumed that world market prices for agricultural products would increase by about 8 percent relative to prices for manufactures and traded services; thus, domestic prices for agricultural products by implication were assumed to decline by 12 percent in relative terms. These assumptions are reflected in the following equations:

$$FCP(EX, i) = FCP(EX, i), i = 1, \dots, 3 \quad (17)$$

$$FCP(IMP, i) = FCP(IMP, i), i = 1, \dots, 3 \quad (18)$$

$$SUBSIDYRATIO(i) = SUBSIDYRATIO(i), i = 1, \dots, 3 \quad (19)$$

$$DUTYRATIO(i) = DUTYRATIO(i), i = 1, \dots, 3 \quad (20)$$

Equations (17)–(20) allow for the exogenous setting of the foreign currency prices of exports and imports, as well as the subsidy and duty ratios in the traded goods’ sectors of the model.

### Market Closure

The model is closed by a set of equations that link demand and supply by imposing market clearing on all markets except the labor market.

### Markets for Primary Factors

By assumption there is a slack in the labor market as wage-earners keep real wages fixed at a rate above the market-clearing level. Capital and land are assumed not to move between sectors and equilibrium in the markets for these factors is attained by adaption of demand:

$$P(LAB) = CONSUMERPRICEINDEX[P(DOM, 1), P(DOM, 2), P(DOM, 3), P(DOM, 4), P(IMP, 1), P(IMP, 2), P(IMP, 3)]. \quad (21)$$

$$CAP(j) = CAP(j); j = 1, \dots, 4. \quad (22)$$

$$LAND(j) = LAND; j = 1. \quad (23)$$

<sup>95</sup> In a recent study by the OECD (OECD (1988)) the average producer subsidy equivalent for the EC was estimated at 37 percent in 1979–81. Of this, 70 percent was accounted for by agricultural pricing policies under the CAP. Thus, abolition of the CAP was assumed to reduce the producer subsidy equivalent by about 26 percentage points, which translates into a 20 percent reduction in the average duty and subsidy ratio.



## Domestic Production

Equilibrium in the markets for output from the four sectors requires that total domestic production satisfy aggregate demand:

$$Z(i) = \sum_j INTERINPUT(DOM, i, j) + INV(DOM, i) + CONS(DOM, i) + GOV(DOM, i) + EX(i);$$

$$i = 1, 2, 3, 4. \quad (24)$$

## External Balance

By assumption, the foreign currency value of the exports equals the foreign currency value of imports so that domestic absorption is determined by aggregate output, with traded goods inflated by their terms of trade:

$$ABS = \sum_i Z(i) * FCP(EX, i) / FCP(IMP, i) + Z(4),$$

$$i = 1, 2, 3. \quad (25)$$

## Mathematical Structure

In practice, all equations described above are formulated in a log-linear form and the model constitutes a linear equation system that can be solved for percentage changes in all endogenous variables.<sup>96</sup>

## Parameter Settings

The model is numerically specified for the Federal Republic of Germany, and the initial demand and supply structure is represented by a German input-output table for 1980.<sup>97</sup> The key parameter settings are shown in Table 50.

The underlying household utility function is assumed to be additive; thus the uncompensated own price elasticities ( $n_{ii}$ ) and cross-price elasticities ( $n_{ij}$  for  $i \neq j$ ) can be derived as follows:<sup>98</sup>

$$n_{ii} = (\xi_i / w) - \xi_i \alpha_i [1 + (\xi_i / w)]$$

$$n_{ij} = -\xi_i \alpha_i [1 + (\xi_j / w)] \text{ for } i \neq j.$$

Here  $\xi_i$  represents the expenditure elasticity for product  $i$ , while  $w$  is the Frisch parameter and  $\alpha_i$  is the household

<sup>96</sup> The model, as described above, contains 84 endogenous variables that are explained by the same number of equations. The specification of the equations ensures that the solution of the model is unique.

<sup>97</sup> For agriculture it was assumed that 50 percent of gross value added in the base year covered labor costs, while the remainder was evenly distributed on capital and land. For all other sectors, labor costs in the base year were represented by total wage costs, while the rest of gross value added was assumed to constitute the cost of capital utilization.

<sup>98</sup> See Lluch, Powell, and Williams (1977).

**Table 50. Federal Republic of Germany: Key Parameter Settings**

	Agriculture	Industry	Traded Services	Nontraded Services
Expenditure elasticity <sup>1</sup>	0.63	0.63	1.16	1.43
Elasticity of substitution between domestic production and imports <sup>2</sup>	1	1	1	
Elasticity of substitution between primary factors <sup>3</sup>	0.3	1	1	1

<sup>1</sup> Based on Lluch, Powell, and Williams (1977, p. 54).

<sup>2</sup> Based on Lächler (1985, p. 85) and Fund staff calculations. These elasticities are assumed to be the same for all uses.

<sup>3</sup> A simple Cobb-Douglas production function was assumed to characterize industry and the service sectors, while the substitution elasticity for primary factors in agriculture was set at a level, which brought the output supply price elasticity in line with estimates from the literature.

budget share for product  $i$ . The Frisch parameter was set at  $-1.83$ .<sup>99</sup>

## Numerical Results

The effects of an ending of agricultural price support under the CAP on the German economy are simulated by lowering the rates of subsidization/import protection by 26 percentage points<sup>100</sup> and increasing the world market price for agricultural products by 8 percent relative to that for manufactures. The macroeconomic consequences are substantial (Table 51). Aggregate output increases by 3.6 percent and employment by 5.5 percent as the reduction in output and employment in the agricultural sector is more than compensated for by increases in other sectors. The

**Table 51. Federal Republic of Germany: Changes Elicited by the Abolition of Agricultural Protection Through the CAP**

(In percent)

	Agricultural Goods	Industrial Goods	Traded Services	Nontraded Services	Total
Domestic output	-5.8	5.8	2.3	3.7	3.6
Employment	-11.6	7.8	4.4	5.5	5.5
Exports	-86.5	12.3	-10.4		4.5
Imports	0.8	4.4	3.6		3.8
Consumption	5.9	1.8	3.3	4.1	3.4
Domestic currency prices	-12.0	—	—	—	-1.7
Foreign currency prices	8.0	—	—	—	...
Terms of trade	...	...	...	...	-0.7
Real income	...	...	...	...	3.4

Source: Fund staff calculations.

<sup>99</sup> Using the relationship between per capita GDP and  $w$  estimated by Lluch, Powell, and Williams (1977, p. 248).

<sup>100</sup> Recall that this translates into a 20 percent reduction in the subsidy/duty ratio for agricultural products.

consumer price level falls by 1.7 percent and the terms of trade worsen by 0.7 percent. As a result of the latter change, real income and domestic demand increase by slightly less than aggregate output. These results are, of course, dependent upon the numerous model assumptions. In particular, with real consumption wages, that is, the nominal wage deflated by the consumer price level, assumed constant, real output wages, that is, the nominal wage deflated by the product price level, decline, and employment and output increase. To the extent that the reduction in the consumer price level would give rise to an increase in real consumption wages, employment, and output, and real income gains owing to liberalization of agricultural policies would be smaller.

### Sectoral Effects on Output

The elimination of agricultural price support reduces domestic currency prices for agricultural goods to the level of world market prices. Consequently, farmers reduce output and employment until marginal costs meet the new output price. Wages decline relative to output prices in the nonagricultural sectors, reflecting the assumption of fixed real consumption wages, so that producers in these sectors increase employment and output. The expansion is most pronounced in industry and in the nontraded services' sector, where production is more labor intensive than in the traded services' sector. The net effect of these sectoral output changes is a significant increase in aggregate output and employment.

### Domestic Demand and Trade Flows

The decline in domestic agricultural prices reduces production and increases consumption of agricultural goods; consequently, exports decline.<sup>101</sup> Exports of the industrial sector, on the other hand, increase as the expansion in output, elicited by the drop in wages relative to output prices, exceeds the increase in domestic demand. The relatively small rise in domestic demand for manufactures reflects low growth in consumption, which is due chiefly to the relatively small expenditure elasticity of households for this product group. Reflecting a moderate increase in output (owing to a relatively low labor intensity of production) and a strong increase in domestic demand (owing to a substantial increase in consumption),<sup>102</sup> exports of services decline.

<sup>101</sup> The alternative possible solution, a fall in stocks, is not incorporated into the model. The drop in exports may seem large, but in 1980 exports accounted for only 7¼ percent of domestically produced agricultural goods.

<sup>102</sup> Note that the expenditure elasticity of households for this product group is greater than one.

**Table 52. Federal Republic of Germany: Notation of Variables**

Variable name	Interpretation
<i>INTERINPUT[DOM,i,j]</i>	Sector <i>j</i> 's use of intermediate inputs, delivered by sector <i>i</i>
<i>INTERINPUT[IMP,i,j]</i>	Sector <i>j</i> 's use of imported intermediate inputs of type <i>i</i>
<i>LAB[j]</i>	Use of labor by sector <i>j</i>
<i>CAP[j]</i>	Use of fixed capital by sector <i>j</i>
<i>LAND[j]</i>	Use of land by sector <i>j</i>
<i>Z[j]</i>	Total production in sector <i>j</i>
<i>INV[DOM,i]</i>	Investment in domestically produced goods of type <i>i</i>
<i>INV[IMP,i]</i>	Investment in imported goods of type <i>i</i>
<i>INV[TOTAL]</i>	Total investment
<i>CONS[DOM,i]</i>	Consumption of domestically produced goods of type <i>i</i>
<i>CONS[IMP,i]</i>	Consumption of imported goods of type <i>i</i>
<i>CONS[TOTAL]</i>	Total consumption
<i>GOV[DOM,i]</i>	Government consumption of domestically produced goods of type <i>i</i>
<i>EX[i]</i>	Exports of domestically produced goods of type <i>i</i>
<i>IMP[i]</i>	Imports of type <i>i</i>
<i>P[DOM,i]</i>	Price of domestically produced goods of type <i>i</i>
<i>P[IMP,i]</i>	Price of imports of type <i>i</i>
<i>P[LAB]</i>	Price of labor
<i>P[CAP]</i>	Price of capital
<i>ABS</i>	Real domestic absorption
<i>P[LAND]</i>	Price of land
<i>FCP[EX,i]</i>	Foreign currency price of exports of type <i>i</i> in the world market
<i>FCP[IMP,i]</i>	Foreign currency price of imports of type <i>i</i> in the world market
<i>XRATE</i>	Exchange rate (measured in local currency per unit of foreign currency)
<i>MARKUP</i>	Markup factor in foreign trade (covering transport, wholesale, etc.)
<i>SUBSIDYRATIO(i)</i>	1 plus the ad valorem rate of export protection for good <i>i</i>
<i>DUTYRATIO(i)</i>	1 plus the ad valorem rate of import protection for good <i>i</i>

Consumption of nontraded services rises strongly owing to the high expenditure elasticity of households for this product group. Domestic demand, however, increases by somewhat less because of a smaller rise in government demand.

The development of imports depends upon the changes in

final domestic demand and in the demand for intermediate goods. In agriculture, higher consumption demand for imports is partly offset by lower input demand so that imports of agricultural goods increase only little. In industry, on the other hand, strong input demand boosts imports despite a relatively small increase in final domestic demand (particularly consumption). Imports of traded services increase substantially because the rise of final domestic demand exceeds output growth. Owing to the assumption of external balance in foreign currency terms and a deterioration in the terms of trade, aggregate import volumes increase by somewhat less than the volume of aggregate exports.

## Concluding Remarks

The model simulation shows that intersectoral dependencies are important in the debate on the consequences of the CAP. Strong effects on nonagricultural production, prices, and trade are likely to be transmitted through factor markets. Thus, an assessment of the CAP cannot be made solely by judging the CAP's ability to live up to its own stated objectives but has to take account of its influence on other variables. The simulation indicates that the influence of the CAP on EC countries' GDP, employment, inflation, and balance of payments is significantly negative.

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