

THE COMMON AGRICULTURAL POLICY OF THE EEC:

Effects on The Grain Sector

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The European Economic Community's (EEC's) Common Agricultural Policy (CAP) is an agricultural support system designed to supplant member countries' protective measures and to ensure satisfactory incomes to the agricultural sector. Basically, it is a series of price-setting policies for different agricultural goods combined with policies intended to promote structural reforms in the agricultural sector and thus raise productivity and standards of living.

Monetary problems, both within the Community and in the international market, have affected the functions of the CAP. The introduction of floating exchange rates has played havoc with price policies, which are fixed in units of account (u.a.) equivalent to the U.S. dollar. Thus, as exchange rates adjust, variations in intra-EEC prices lead to arbitrage pressures, circumventing the prime purpose of the CAP. Increased subsidies have been necessary to shield the EEC agricultural market from the effects of floating rates. By 1976 the cost in monetary terms alone of maintaining price supports was nearly 5 billion u.a., with an additional 1 billion u.a. budgeted to ease price fluctuations resulting from currency revaluations.¹

In the face of rising costs and increasing pressures from both national governments and consumers to reform the CAP, it is appropriate to consider some of the costs and benefits that this type of protective policy entails. Costs have certainly increased since the beginning of 1970 due to floating exchange rates; this essentially arises from the attempt to operate a uniform price policy in the absence of economic and monetary union. Yet even assuming there was complete economic and monetary union, the gains and losses from protective policies in the EEC would still exist and accrue to different sectors.

This article attempts to define and measure empirically some of the gains and losses arising from the CAP under the assumption of adequate institutional arrangements, such as existed prior to 1970, to prevent price fluctuations due to currency revaluations within the

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1. "CAP for the Scrapheap?" *The Economist*, No. 259, April 17, 1976, p. 53.

Common Market. Special attention is paid to the soft wheat sector. Not only was this sector among the first to achieve a common price policy, but high grain prices and sizeable surpluses indicate that the pricing policy has been out of line with market equilibrating forces. These indications, together with the problems resulting from monetary disturbances, suggest that the CAP or similar protectionist policies may be more costly than beneficial.

Like most industrialized countries, the members of the EEC have tended to push the agricultural sector into the background. Prior to integration efforts, the agriculture sector was already considered a welfare problem that required highly protective policies. In addition, agricultural groups, especially in West Germany were politically very powerful. Thus, in discussing costs and benefits of the CAP, it is necessary to remember that removal of the CAP would not mean a complete removal of agricultural protectionism or high agricultural prices within the EEC. As one French agricultural minister remarked, "Opening Europe to free trade in agriculture would be a catastrophe."²

Historically, Europe has been deficit in grains. In the years 1956 to 1966 (before unified grain prices), the deficit was fairly constant between 9.5 to 10.5 million metric tons per year, with West Germany the major importer (3 to 5 million metric tons per year).³ Although France and Italy, for example, produce surpluses of some grains, part of the grain deficit has to do with poor substitutability among grains (soft vs. hard wheat, food grains vs. feed grains), as well as poor marketing systems linking the members.

After World War II, pressures for self-sufficiency in agriculture, especially in grains and other "basic" temperate-zone products, and for maximizing the farm population for political and economic stability, increased. This led to fragmentation of farm holdings ($\frac{3}{4}$ of German and over $\frac{1}{2}$ of French farms have less than 25 acres).⁴ France, for example, is the largest and most important agricultural country in the EEC, with the most arable land and the largest output. However, the relatively small holdings and the lack of mechanization and other modern techniques have kept French producer costs relatively high, and French agricultural products less competitive on the world market. The German market, the largest and most lucrative agricultural import market in the EEC, is important for France, who under the CAP could compete much more easily with higher-cost German producers. Thus,

2. Paul Minneman, "Agriculture in France and the European Community" in S.N. Nettleton, *France and the European Community* (Ohio State University Press, 1964), p. 92.

3. USDA, Economic Research Service, *The Grain-Livestock Economy of the EEC*, Foreign Agricultural Report #31, p. v.

4. Minneman, *op. cit.*, p. 85.

the CAP became the *sine qua non* for French participation in the developing EEC in the late 1950's.

When discussions were underway for establishing the European Common Market, it was evident that special measures for agriculture would have to be taken. None of the prospective members could easily dismantle their extensive agriculture protection schemes, especially without assurances of something to replace them.

The Treaty of Rome, the agreement founding the Common Market, provided for the CAP under Title II, "Agriculture", Article 39.⁵ The objectives of the CAP were listed under Section 1:

- 1) to increase agricultural productivity by developing technical progress and ensuring rapid development of agricultural production and optimum utilization of factors of production, especially labor;
- 2) to ensure favorable living standards for the agricultural population, especially by increasing farmer incomes;
- 3) to stabilize markets;
- 4) to guarantee regular supplies;
- 5) to ensure reasonable prices to consumers.

Section 2 of the same article cautioned that in working out the CAP, due account would be taken of the social structure of the agriculture sector in the participating countries (primarily the small family farm), the national and regional disparities within the Community, the need to make the adjustments gradually, and the close linkage of the agricultural sector with the rest of the economy. Thus, the CAP was not designed to be a radical measure but rather a moderate process of replacing national support systems with Community-wide ones.

The Treaty also outlined the means to achieve the above-mentioned objectives. A single Community-wide market for agricultural goods would be established. National price policies would be replaced by Community policies. Particular marketing arrangements and price policies would be dependent on the particular commodity, some being classified as non-competitive (no intervention or price policies), some as partially competitive (protected by import tariffs) and some as subject to market intervention (price and import policies). The first regulations were extended to grains, fruits and vegetables, wine, pork, poultry and eggs in 1962. In 1964, regulations on rice, beef and veal, and milk products were added.

5. See Gordon Weil (ed.), *A Handbook on the European Economic Community* (New York: Praeger, 1965), p. 36.

Table 1. EEC Uniform Basic Target Prices for Grains
(US \$ per metric ton)

	Soft Wheat	Durum Wheat	Barley
Basic Target Prices, adopted 12/15/64, effective 7/1/67.	106.25	125.00	91.25
Basic Target Prices, 7/1/64 (by country)			
France	100.22	117.26	83.00
West Germany	118.88		103.00
Italy	113.60	143.20	72.22
Netherlands	104.83		82.32
Belgium	104.60	89.00	
Luxembourg	117.00		89.00

Source: Fox, "Estimating the Effects of the EEC Common Grain Policy" *Journal of Farm Economics*, Vol. 49 (1967), p. 372.

Price Policy

Price policy is based on the procedure of establishing a *target price*, a *threshold price* for imports, and an *intervention price*. The target price, prior to 1967, was set by member countries themselves as the price prevailing in the domestic market center with the largest deficit. A ceiling and a floor price were set for the entire Community, the intention being that these prices would gradually "squeeze together" into a common price. When this failed to happen the EEC adopted common grain prices, effective in 1967.

Since 1967, the target price for the entire Community has been set by the prevailing price at Duisburg, West Germany, which was selected as the center of the area within the EEC with the largest grain deficit. This price is the "target" toward which all grain prices in the Community should tend. Prices are maintained around the target price in two ways. First, threshold prices are set for imports from non-EEC members. These are determined at various EEC ports of entry, and differ from the target price by transportation costs from the port to Duisburg. A *variable levy* makes up the difference between the world price and the threshold price. This levy is set daily by the EEC, according to the prevailing world price, with allowances for quality and different ports of entry.

Intervention pricing is more complex. A basic intervention price is set at Duisburg, approximately 7% below the basic target price. Intervention prices are then derived for each of the set intervention points throughout the Community, which are numerous—124 in Germany,

279 in France, 431 in Italy and 4 in Benelux.⁶ The derived intervention prices are set in accordance with national marketing price formation, but the producer price is actually below the intervention price by the cost of transportation to Duisburg. If the market price for grains falls below the intervention price, the CAP intervention agency is required to step in and buy to support prices. In the case of wheat, this has left the intervention agency with sometimes sizeable stocks, which either have to be stored, exported, or denatured and sold as feed grain.

Prices are thus kept within bounds. The threshold price is a maximum, above which imports are allowed to enter to fill excess demand. The intervention price is a minimum to ensure basic prices for producers. The target price lies in between. Under this system, it was hoped that a certain degree of flexibility and freedom would be retained in the intricate business of tampering with the market price system. This system has many advantages. It can be administered without protracted negotiations, a stumbling block to many projects designed to promote European integration. It provides a measure of security to producers, and thus aids medium-term planning. Further, by providing for imports and not promoting complete self-sufficiency, the EEC hoped to show that it still welcomed imports (and thus would not be opposed to the GATT guidelines). In setting prices, the EEC guideline is that target prices must not lead to undue expansion of production, although this has not quite been the case.

In order to be exported, however, grain must be subsidized by the difference between the EEC producer price and the world market price. Export restitutions are calculated weekly, according to region of the EEC, producer price prevailing there and transport costs. Internal prices are also increased by monthly increments, to a maximum of 8—10% above the target price, in order to encourage orderly marketing and compensate farmers for interest and storage costs. Grain prices also differ according to quality standards, European soft wheat being of rather lower quality than imported durum wheat.

Monetary problems since 1969 have seriously affected the working of the price policies as outlined above. In 1969, the French franc was devalued 11.1% and the German mark revalued 9.3%. As prices are fixed in units of account (u.a.) equivalent to the U. S. dollar, changes in members' exchange rates raise and lower common market prices. France was allowed to retain pre-devaluation producer price levels, with a special system of import subsidies and export taxes, "Monetary Compensatory Amounts" (MCA's), to isolate price changes from the

6. See Michael Butterwick and Edmund N. Rolfe, *Food, Farming and the Common Market* (London: Oxford University Press, 1968), p. 101.

rest of the Community. When the currency floats down, MCA's are charged on exports (now cheaper vis-a-vis other members' goods) and paid out on imports (now more expensive).⁷ Germany was kept at pre-valuation prices only for one year, and then prices were realigned with the true German exchange rates. In order to compensate farmers for loss of income, funds were distributed by the European Agricultural Guidance and Guarantee Fund and by the Bonn government. Despite efforts to maintain the CAP in its original form, in 1972 four price zones within the Community were established roughly along national lines or groupings, each zone with its own import levy rates and export subsidies under the MCA program vis-a-vis both other members and third countries.⁸ Thus, while the CAP is still intact, the common market for agriculture has been broken down into four regional markets.

Mansholt Report

By the late 1960's, it was becoming clear that price policies alone would not accomplish the objectives of the CAP as set down in the Treaty of Rome. The Mansholt Report called for structural reforms in European agriculture to help improve living standards for farmers and increase agricultural productivity. The Report first called for an improvement of market and price policies, including a limitation of surpluses, market reorganization in several countries, and more realistic pricing policies. The main thrust of the Report, however, was for structural reforms. The Report sought to encourage migration out of agriculture, consolidate the traditionally small family holdings into larger, more productive farms, increase the efficiency of the intra-EEC marketing system, and improve agricultural management and technology. Social service and technical measures were suggested both to move people out of agriculture and to modernize the sector. Although these suggestions have not yet been implemented, they have served as a set of guidelines for national agricultural planning and for the CAP.

Financing the CAP

CAP financing is accomplished primarily through the European Agricultural Guidance and Guarantee Fund (Fond Européen d'Orientation et de Garantie Agricole—FEOGA). The FEOGA has grown from \$2.1 billion in 1960 to over \$6.3 billion in 1968.⁹ It has

7. "CAP for the Scrapheap?" *op. cit.*, p. 53.

8. See USDA, "The Agricultural Situation in Western Europe" (1969 Review), pp 13-15.

9. This cost of protection can be compared with an estimated \$5.45 billion in the USA in 1968. See Erik Thorbecke and Emilio Pagoulatos, "The Effects of European Economic Integration on Agriculture" in Bela Belassa (ed.), *European Economic Integration* (Amsterdam: North Holland, 1975), p. 281.

two sections, the Guarantee Section, which handles export restitutions and home market interventions, and the Guidance Section, which allocates funds to promote technical progress, improve productivity, and institute structural changes. The lion's share of the budget, however, is distributed through the Guarantee Section. For example, in fiscal year 1968-69, total Guarantee Section expenditures were \$666.0 million for grains alone (of which \$212 million was for market intervention and \$454.0 million for export subsidies), compared to a total (all commodities) of \$285.0 million for the Guidance Section. Another \$138.3 million was spent through the Special Section, set up to offset lower producer prices for wheat producers in Germany, Italy and Luxembourg after the common price policies came into effect.¹⁰

The balance of FEOGA benefits in its first five years accrued mainly to France, with Germany the largest loser. This is primarily because French prices were supported considerably by the CAP measures.

Table 2. Balance of FEOGA Expenditures, 1962-1968
[millions of US\$]

Country	Guarantee Section	Total FEOGA
Belgium	-60.3	-85.3
Luxembourg	-3.6	+ 1.3
France	+ 439.3	+ 342.5
West Germany	-375.0	-323.6
Italy	-104.5	-11.3
Netherlands	+ 104.3	+ 76.4

Source: USDA, "The European Community's Common Agricultural Policy Implications for US Trade," Foreign Agricultural Economic Report #55, (Washington, DC: 1970), p. 104.

Up until 1969, the FEOGA was largely financed (90%) by variable levies and other customs duties, the deficit being made up by contributions from member countries according to economic size. In 1969 a new financing agreement was proposed to make the FEOGA self-financing by 1978, the transition to be accomplished in four stages.¹¹ Member states, however, would still require extensive national financing in addition to the CAP, especially for structural measures, capital lending to the agricultural sector, and modernization and retraining programs. In addition, monetary problems after 1971 raised costs for national governments, especially for West Germany, as common prices were maintained in the face of revaluations and devaluations.

10. USDA, "The European Community's Common Agricultural Policy", Foreign Agricultural Report #55 (Washington, D.C.: 1970), p. 102.

11. USDA, "The Agricultural Situation in Western Europe: Review of 1969 and Outlook for 1970" (Washington, D.C.: 1970), p. 17.

Grain Consumption and Production

Grain consumption has been declining in the EEC. Per capita food grain consumption (direct, not including indirect consumption via feed grains for animal products) has declined at an average annual rate of 1.5% per year.¹² Demand for feed grain, however, has been growing, as higher incomes and changing food habits increase the demand for meat. Population growth within Europe has been slow and has not offset increases in grain production. These two effects, declining direct consumption of grains due to increased incomes and falling rates of population growth, have decreased the demand for grain.

Table 3. Consumption of Grains in the EEC, 1964, 1968 and (projected) 1975.

(000 metric tons)	1964	1968	1975 [Projected]
Food Grain	23,117	22,239	21,212
Feed Grain	45,094	51,032	61,132
Total Grain	68,211	73,271	82,344

Source: Ferris et.al., *The Impact on US Agricultural Trade of the Accession of the UK, Denmark, Ireland and Norway to the EEC*, Research Report #1, Michigan State Univ. Institute of International Agricultural (1971) p. 347.

The CAP has meant higher food prices, however. France's food prices were raised an estimated 3% by the CAP, the Netherlands' by 5% and Italy's by 1-2%.¹³ Production has increased at a rate of approximately 4.9%.¹⁴ Increased production coupled with decreased consumption in food grains has left the EEC with costly problems of surpluses of soft wheat (the major food grain produced), and deficits and high producer costs in feed grains. Thus, despite surpluses, the EEC must still import grains from outside countries.

Table 4. Production of Grains in the EEC, 1964, 1968 and (projected) 1975.

(000 metric tons)	1964	1968	1975 [Projected]
Food Grain	33,545	35,704	38,040
Feed Grain	27,615	34,696	44,885
Total Grain	61,160	70,400	78,969

Source: Ferris et.al. *The Impact on US Agricultural Trade of the Accession of the U.K. Denmark, Ireland and Norway to the EEC*, Research Report #1, Michigan State Univ. Institute of International Agriculture. (1971), p. 345.

12. J.N. Ferris et.al., *The Impact on US Agricultural Trade of the Accession of the UK, Denmark, Ireland and Norway to the EEC*, Research Report #1, (Michigan State University Institute of International Agriculture, 1971), p. 340.

13. Weil, op.cit., p. 339.

14. Ferris et.al., op. cit., p. 340.

Of the original six member countries of the EEC,¹⁵ France has the greatest capacity for increasing grain production under the CAP.¹⁶ However, projections of French grain production done in the late 1960's indicate that while France will increase production from 27.4 million metric tons in 1964 to an estimated 34.9 million metric tons in 1975, the increase will be largely due to increases in average yield, rather than in number of acres brought under cultivation.¹⁷ These increases in average yields are due to a number of factors. First, productivity of land has been relatively lower in France due to a low population density and large use of land for forage. Forage land could be turned over to grain production, but this land is marginal. The impact of higher producer prices on French grain production, however, manifests itself through secondary effects. Higher prices mean higher farmer incomes, less migration out of agriculture, and higher savings. Capital accumulation leads to technical improvements, including increased mechanization. Structural policies, especially in the area of consolidation of farmlands, also help to increase yields.

Germany is a less important agricultural producer than France. The CAP has meant lower producer prices for German farmers, yet the response has been increased yields, as in France. This is attributable to a number of circumstances. First, while grain prices dropped an estimated 10% under the CAP,¹⁸ prices of other agricultural goods dropped also. Thus, while a normal response would have been to switch to the production of new commodities, all commodity producer prices fell simultaneously, and there was no real advantage in switching production. The major effects of the drop in producer prices will be felt through decreased farm incomes, and the accompanying implications of lower savings and capital availability on efforts to modernize. In the long run, the drop in farmer incomes will help encourage the desired out-migration from agriculture. Farm structure is a major limiting factor in the adoption of modern and lower-cost methods. Land is a preferred form of wealth; thus its turnover is low and its price is high. Existing holdings are fragmented, and traditional village structures have inhibited expansion.¹⁹ Low farm incomes and lack of government programs have prevented the necessary structural changes to hold costs

15. Original members are France, West Germany, Italy, Belgium, the Netherlands, and Luxembourg. Britain, Ireland and Denmark joined in 1972.

16. Minneman, *op. cit.*, p. 89.

17. M. J. Petit and J. B. Viallon, *The Grain-Livestock Economy of France*, Research Report #3 (Michigan State University Institute of International Agriculture, 1968), p. 30.

18. G.E. Rossmiller, *The Grain-Livestock Economy of West Germany*, Research Report #1 (Michigan State University Institute of International Agriculture, 1968), p. 193.

19. R.W. Fox, "Estimating the Effects of the EEC Common Grain Policy", *Journal of Farm Economics*, Vol. 49 (1967), pp. 12-40.

down to a more competitive level. Fixity of resources and input combinations available to German farmers have restricted responses to producer price changes. Projections for German production indicate that increased grain production, as for France, will be largely due to increased yields, with only small increases in cultivated land.²⁰

The increased production and decreased consumption has led to the problem of surpluses of soft wheat. High producer prices for French farmers have exacerbated the situation. In 1969, the surplus exceeded 10 million metric tons. The FEOGA must buy up surpluses below the intervention price, and then dispose of them. The alternatives to selling on the EEC market (which usually causes increased price disturbances) are exporting, denaturing, or stockpiling, all three of which entail costs. Though exports must be subsidized by the difference between the world price and the intervention price, they remain the usual means of disposal. The wheat can also be denatured and sold as feed grain on the EEC market, but denaturing is expensive. The third alternative is storing the grain, which entails its own costs. In 1971, wheat stocks in the EEC were 4.1 million metric tons.²¹ The costs in 1971 for guaranteeing the grain prices and for exports were \$703.5 million.

With the entry of Britain, Ireland and Denmark into the EEC the surplus problem could be alleviated. Both Britain and Ireland are deficit wheat producers, Britain producing less than 50% of its domestic needs. However, Britain made no significant move to switch to lower cost EEC grain until 1973, when world prices rose above CAP prices for a season due to poor world grain crops.²² Denmark is a surplus producer but has the capability of switching to feed grain production, in which the EEC is deficit. Alternatively, higher producer prices under the CAP could stimulate cereal production in Britain.²³

The CAP and Trade

The CAP has affected agricultural trade both within the EEC and with third countries. Prior to the CAP, Europe was a net importer of grains. While the EEC has remained a grain importer, there have been shifts among types of grains. The share of intra-EEC to total EEC imports of temperate zone agricultural products increased from 23.1% in 1961 to 37.5% in 1969.²⁴ There has been a decline in demand for imports of grain, most notably from the U.S. and Canada.

Hard (durum) wheat and feed grains remain the most important

20. See Rossmiller, *op. cit.*, pp. 195-199.

21. USDA, "The Agricultural Situation in Western Europe: Review of 1971 and Outlook for 1972" (Washington, D.C.: 1972), p. 6.

22. "Grain: Price Mad, Supply Fair", *The Economist*, No. 248, August 18, 1973, p. 54.

23. USDA, "The Agricultural Situation" (1971), *op. cit.*, pp. 7-11.

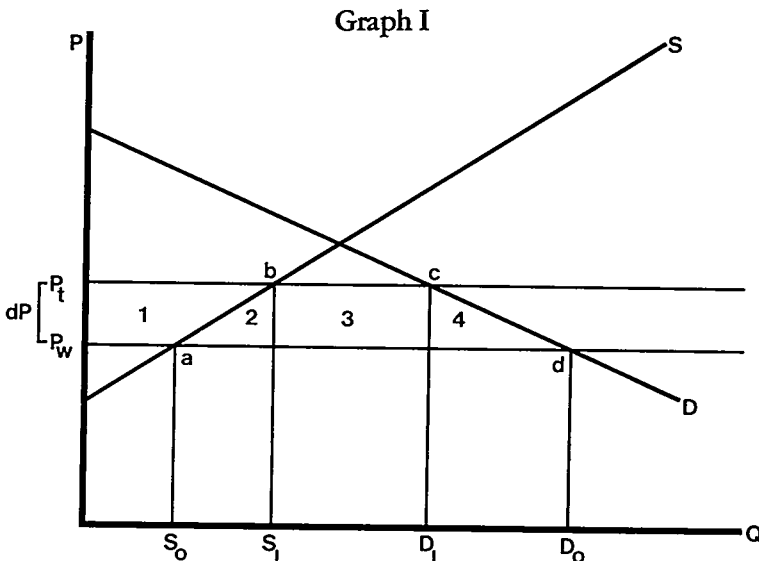
24. Thorbecke and Pagoulatos, *op. cit.*, p. 289.

imports, largely because the EEC does not grow sizeable amounts of durum wheat, and because the price ratio has favored production of soft wheat over feed grains. This leads to suspicions of trade diversion within the EEC from lower-cost third country sources to higher cost member sources.²⁵

Measuring the Costs and Benefits of the CAP

The previous discussion has indicated areas where costs and benefits of the CAP can be assessed. A total measurement of these is perhaps beyond the scope of this paper, but their sources can be indicated.

The concepts of producer and consumer surplus are useful in indicating some of these sources. The following graph shows demand and supply relations within the grain sector of a hypothetical country imposing a variable levy. S is the supply curve, domestic producers only, while D is the demand curve of domestic consumers. At the world price P_w before a protective policy is imposed, the home country produces S_0 tons of wheat and demands D_0 tons. Thus, imports are $D_0 - S_0$. A variable levy is imposed upon imports and domestic producers are guaranteed the higher price of P_t . Supply is increased to S_1 and demand falls to D_1 . Imports also fall, due both to rising domestic supply and falling domestic demand; imports are now $D_1 - S_1$.



25. See Fox, *op. cit.* for estimates of trade creation and diversion effects resulting from the CAP. Total estimated production effects were negative; that is, the increase in the value of EEC production minus the cost of providing increased quantity by imports from non-EEC members ranged from \$261.8 million to \$360.8 million.

Welfare gains and losses from the protective policy can be estimated according to the concepts of consumer and producer surpluses. Producer's net gain is area 1. Graphically, this is:

$$(1) S_0 (P_t - P_w) + \frac{1}{2} (S_1 - S_0) (P_t - P_w)$$

Substituting dP for $(P_t - P_w)$, equation (1) can be rewritten as:

$$(2) S_0 dP + \frac{1}{2} (S_1 - S_0) dP$$

Government gain is in the form of increased revenues from the variable levy, which equals the difference between the domestic and the world price. Graphically this is area 3.

$$(3) dP (D_1 - S_1)$$

Area 2 is the loss from the excess cost of securing the additional output at domestic rather than at world prices:

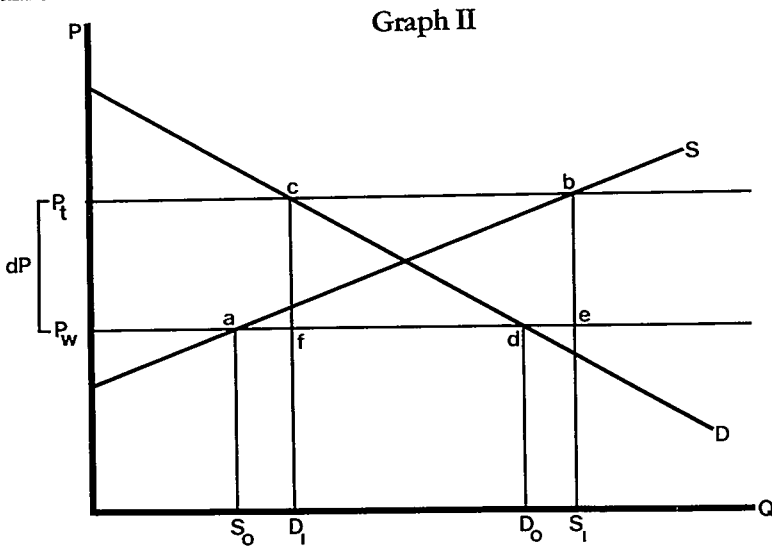
$$(4) \frac{1}{2} (S_1 - S_0) dP$$

Area 4 is the deadweight loss:

$$(5) \frac{1}{2} (D_0 - D_1) dP$$

Total consumer loss after imposition of the protective policy is areas 1 + 2 + 3 + 4. Total gains are areas 1 (gain in producer surplus) and 3 (gain in government revenues). Thus, total net losses are areas 2 and 4.

In the case of the soft wheat sector in the EEC, this graphical analysis is complicated by the fact that the EEC went from being a net soft wheat importer before imposition of the CAP to being a net soft wheat exporter by 1968, six years after the imposition of the protective policies. Thus, the graphic representation of welfare gains and losses must be amended.



The gain in producer surplus, area 1 on Graph I, is now the area abP_1P_w . The equation for its area remains the same. Government gain on Graph I, area 3, is now government loss on Graph II. As an exporter of soft wheat, the EEC must subsidize the exports by the difference between the internal producer price P_1 and the world price P_w at a cost to the government of $(P_1 - P_w)(S_1 - D_1)$ or, substituting dP ,

$$(6) \quad dP(S_1 - D_1)$$

This is the rectangle cbe on Graph II.

Area 2 on Graph I, the loss from the excess cost of securing the additional output at domestic rather than world prices, is now triangle abc on Graph II. Its formula remains the same. Area 4 on Graph I, the deadweight loss, is now triangle efd on Graph II.

Total gain in producer surplus is area abP_1P_w . Total loss in consumer surplus is area cdP_wP_1 . Its area is:

$$(7) \quad D_1 dP + \frac{1}{2}(D_0 - D_1) dP$$

In addition, there is now a government loss in the costs of subsidizing exports.

A number of studies have been done to estimate various aspects of the costs and benefits of the CAP over various periods of its existence. Krause²⁶ presented an *ex-ante* study of the CAP concluded in 1966 (before the common grain prices went into effect). He estimated that in 1963-64, non-member countries lost over \$300 million in agricultural exports to the EEC, the US absorbing over half this loss, especially in the areas of grains and meats.²⁷ He also noted, although without measuring, the welfare implications of the CAP on the world economy as well as on the EEC economy. These include balance of payments deficits (since Europe would be importing less), the "stifling" of trade, and poor investment decisions within the EEC based on a distorted market situation.

Dardis and Learn²⁸ presented a general mathematical model to estimate the degree and costs of agricultural protection, which they applied to the EEC situation as well as to the U.S. Unfortunately, their model was applied in 1962, before the CAP, but it does give an indication of the levels of protection which existed in Europe prior to the CAP. Their estimated degree of protection for the years 1959 to 1961 for France was 31%, for West Germany 17% and for the U.S. 2%.²⁹

26. Lawrence B. Krause, *European Economic Integration and the United States* (Washington, D.C.: Brookings, 1967).

27. *Ibid.*, p. 9.

28. Rachel Dardis and Elmer W. Learn, *Measures of the Degree and Cost of Economic Protection of Agriculture in Selected Countries*, USDA Economic Research Service (Washington, D.C.: 1968).

29. *Ibid.*, p. 9. It should be noted that no quality adjustments were made, an important point since the US produces and exports high-quality durum wheat, while the EEC produces lower-quality soft wheat.

Rogers and Davey³⁰ estimated the trade effects of the CAP. From 1960 to 1969, world imports of agricultural goods expanded 38%, while EEC imports (excluding intra-EEC trade) expanded only 12%. However, the expansion of agricultural trade within the EEC was 143% in the same period, compared with only 73% in Europe in general.

Fox³¹ estimated the effects of the CAP on the grain sector of the EEC in 1967. He forecast substantial increases in grain production, raising EEC self-sufficiency from 89.6% at the beginning of the decade to 103.6 to 110.2% by 1970. In fact, EEC self-sufficiency increased to 107.3% by 1969.³² He noted that, since the CAP has been in effect, wheat and wheat flour imports have decreased 25.7% in the EEC, while feed grain imports increased 43.1%. The EEC remains deficit in feed grains, partly because the ratio of target prices for food to feed grains favors food grain production.

Thorbecke and Pagoulatos³³ evaluated the effects of the CAP on production, consumption, and trade of a number of temperate zone products. They noted that the estimated effects of the CAP, in addition to expenditures of financing the CAP's variable levy system of \$8 billion, would be to add \$6 to \$7 billion to EEC consumers' food costs, about 10% of the total of an average EEC family's budget. They also presented a model of the import effects of the CAP, indicating that in most cases and especially in grains, the CAP has had a trade-diverting effect, diverting trade from outside to member sources, of an estimated value of \$740 million in 1969 alone.³⁴ A model of the dynamic effects of the CAP on the allocation of the agricultural labor force was also included.³⁵

Josling³⁶ has compared different types of support schemes, including the variable levy scheme as practiced under the CAP. He considered in addition deficiency payment and direct payment schemes. The average cost of \$1 transferred to grain farmers under a variable levy scheme had an economic cost (i.e., real resource cost or real income foregone) of \$.57, a budget cost to the government of -\$.03 (since the levies, like

30. Rogers and Davey, *op. cit.*, p. 10.

31. Fox, *op. cit.*

32. Rogers and Davey, *op. cit.*, p. 12.

33. Thorbecke and Pagoulatos, *op. cit.* See also their summary of existing studies of the CAP, Table 8.5 in the same work.

34. *Ibid.* p. 310.

35. *Ibid.*, pp. 310-16.

36. Tim Josling, "The Common Agricultural Policy of the European Economic Community" in Melvyn Krauss (ed.), *The Economics of Integration* (London: Allen & Unwin, 1973); and Tim Josling, "A Formal Approach to Agricultural Policy", *Journal of Agricultural Economics*, Vol. 20 (1969).

tariffs, brought in revenues), a user cost (to the consumer) of \$1.63, and a foreign cost (to countries exporting grain to the EEC, the cost is in terms of lost grain sales into the EEC) of \$2.87.

Table 5. Estimation of CAP Costs, Marginal and Average

	Economic Cost	Budget Cost	User Cost	Foreign Cost
A. Average Cost of \$1 Transferred to Grain Farmers (in US \$)				
Deficiency Payments	0.17	1.17		0.83
Variable Levy	0.57	-0.05	1.63	2.87
Direct Income Payment		1.00		
B. Marginal Cost of Additional \$1 Transferred to Grain Farmers (US \$)				
Deficiency Payments	0.29	1.29		0.71
Variable Levy	0.99	0.94	1.04	2.46
Direct Income Payment		1.00		

Source: Josling, "The Common Agricultural Policy of the European Economic Community", in M. Krause (ed.), *The Economics of Integration* (London, Allen and Unwin, 1973), p. 279.

It is noteworthy that, of the three schemes, the variable levy system had the highest costs, especially to domestic consumers and foreign sources of supply.

Empirical Estimates and Results

Empirical estimates of the costs and benefits of the CAP were made for the soft wheat sector of the EEC. This sector was chosen for several reasons. First, soft wheat is the major grain produced in the EEC, and was one of the first agricultural commodities to come under the uniform price guidelines of the CAP. Second, the effect of the CAP on the production of soft wheat has been such that the EEC has turned from a net importer of soft wheat in 1960 to a net exporter in 1968. In making empirical estimates, data from 1968 are used, the second year after the alignment of EEC member-country prices for grains. In light of the disturbances in the monetary sector during part of 1969, and the subsequent division of the common market for agricultural goods into four regional markets within the EEC, data were chosen from the period during which the CAP was operating at its optimum level. Theoretically, during this period the gains from the CAP would not be offset by losses due to price adjustments, as in later periods. Table 6, *Parameters and Estimated Values* presents estimates and sources of the parameters used in making the calculations. The mathematical model used to measure dP is presented in the Appendix.

A qualifying statement concerning the findings must be made. No actual statistical studies have been done to estimate the price elasticities of demand, supply, and export for soft wheat in the EEC. Insofar as the figures used were rough estimates, the actual estimates of costs and benefits can be readjusted in the light of the true elasticities. In particular, three elasticity values for θ , the elasticity of exports with respect to P, were used (-10, -7 and -3). In discussing the costs and benefits, the median calculations for $\theta = -7$ will be used; the reader can refer to Table 7, *Empirical Estimates of Costs and Benefits* for results using $\theta = -10$ and $\theta = -3$.

Table 6. Parameters and Estimated Values

Parameter	Value	Comment
D	24,724	Total consumption of soft wheat in the EEC in 1968 in thousand metric tons (including both farm consumption and human consumption). Source: Office Statistique des Communautés Europeenes, <i>Statistique Agricole</i> , No. 1 (Brussels: EC, 1970), p. 13.
S	29,828	Total production of soft wheat in the EEC in 1968 in thousand metric tons. Source: as above, p. 13.
X	2,843	Net exports of soft wheat from the EEC to non-member states in 1968 in thousand metric tons. Source: as above, p. 13.
dI	2,261	Total addition to soft wheat stocks in the EEC in 1968 in thousand metric tons. Source: as above, p. 13.
P_t	\$106.25	Target price for soft wheat in the EEC in 1968, in US\$ per metric ton. Source: Rogers and Davey. (eds) <i>The CAP and Britain</i> , (Lexington, Mass.: Lexington Books, 1973) p. 45.
P_w	\$69.00	Average world price of wheat in US\$ per metric ton, c.i.f. at Britain in 1968. Source: UN FAO, <i>Production Yearbook</i> , Vol. 22 (1968), p. 541.

dL	\$39.25	Size of the variable levy in 1968, in US \$ per metric ton ($P_t - P_w$).
ε	-.01	Price elasticity of demand for wheat, taken from estimates for Denmark in the 1960's (no estimates being available for the EEC in any period). Source: Rogers and Davey, <i>The CAP and Britain</i> , p. 88. This is also close to the estimate made by Schultz for wheat at the farmlevel, of .03. Source: Ferguson and Gould, <i>Microeconomic Theory</i> , (Homewood, Ill: Irwin, 1975), p. 102.
η	1.2	Price elasticity of supply of wheat. No estimate was available for the EEC, so Josling's estimate for the UK was used. Source: Josling, "A Formal Approach to Agricultural Policy", <i>Journal of Agricultural Economics</i> , Vol. 20 (1969), in footnote, p. 182.
θ	-10 -7 -3	Elasticity of exports of soft wheat. No estimate of the true figure for the EEC is available, so three dummy figures were used. θ is assumed to be negative, since as the size of L grows, exports become more expensive and thus will be discouraged (the excess being held as stocks, for example, or denatured for use as feed grain) and since European soft wheat is generally considered inferior on the world market to hard varieties. Calculations were made using all values.
D_0	24,756 24,747 24,729	$\theta = -10$ $\theta = -7$ $\theta = -3$

Demand for wheat if the variable levy and target prices were removed, assuming free trade (i.e. no other protection by member states) in thousand metric tons. (See Graphs I and II). The formula for D_0 is:

$$D_0 = D_1 + \left[\frac{D_1}{P_t} \varepsilon \right] dP_t$$

where D_1 is the demand for 1968, 24,724 thousand metric tons.

S_0	25,253	$\theta = -10$
	26,570	$\theta = -7$
	29,114	$\theta = -3$

Supply of wheat if the variable levy and target prices were removed, again assuming no further protective policies on the part of member states, in thousand metric tons. (See Graphs I and II). The formula for S_0 is:

$$S_0 = S_1 + \left[-\frac{S_1}{P_t} \eta \right] dP_t$$

where S_1 is the supply of wheat in 1968: 29,828 thousand metric tons.

The gain in producer surplus in 1968 was estimated to be \$272,682,000 (US), or roughly 8.6% of total expenditures on soft wheat. This was nearly outweighed by the loss in consumer surplus, estimated at \$236,750,000 or 9% of consumer expenditures on soft wheat for that year. The net gain (producer surplus — consumer surplus) was \$35,932,000 or approximately $\frac{1}{2}$ of producers' receipts for wheat. Thus, it appears that the producer gain from the combination of variable levy and fixed price has been almost compensated for by consumer losses through higher prices. The excess cost of securing the extra wheat output at high domestic prices, rather than at world prices, was estimated to be \$15,752,000, or about 6% of consumer expenditures on wheat in 1968.

Additional losses arise through government subsidies of soft wheat exports. These estimates are approximate, since the subsidy varies considerably, both with the world price and with the system of intervention prices within the EEC at which soft wheat is bought. In 1968, it was estimated that the government spent \$493,550,000 to subsidize wheat exports. Those funds came out of FEOGA, which is supported both through revenues from the variable levy and through member country contributions. In both cases, the burden of the export subsidy falls on the consumer, directly in the form of higher prices resulting from the fixed target price and the variable levy on lower-cost imports of wheat, and indirectly in the form of tax revenues spent on production of wheat (already in excess supply) rather than on other government programs. The deadweight loss in this case was rather small, only \$111,205.

Table 7. Empirical Estimates of Costs and Benefits (US \$)

Cost/Benefit	Graphical Area	Estimate	
Gain in Producer Surplus	Area 1 (Graph I)	\$372,161,000	($\theta = -10$)
	Area $abP_t P_w$ (Graph II)	\$272,682,000	($\theta = -7$)
		\$62,479,000	($\theta = -3$)
Excess Cost at Domestic Prices (Loss)	Area 2 (Graph I)	\$31,064,000	($\theta = -10$)
	Area abe (Graph II)	\$15,752,000	($\theta = -7$)
		\$ 757,000	($\theta = -3$)
Government Subsidy of Exports (Loss)	Area 3 (Graph I)	\$693,120,000	($\theta = -10$)
	Area $cbe f$ (Graph II)	\$493,550,000	($\theta = -7$)
		\$108,200,000	($\theta = -3$)
Deadweight Loss	Area 4 (Graph I)	\$ 217,280	($\theta = -10$)
	Area dfc (Graph II)	\$ 111,205	($\theta = -7$)
		\$ 5,300	($\theta = -3$)
Loss in Consumer Surplus	Area $1+2 + 3 + 4$ (Graph I)	\$335,960,000	($\theta = -10$)
		\$236,750,000	($\theta = -7$)
	Area $cdP_t P_w$ (Graph II)	\$ 52,420,000	($\theta = -3$)

If the CAP were to be removed, these losses would become benefits. The largest benefit would be in the area of government subsidy of imports. Assuming that a free trade situation would ensue, it is likely that the EEC would revert to being a net importer of soft wheat, in which case government subsidies of exports would cease. This is highly likely, as EEC high-cost producers would face severe competition both from lower-cost foreign producers and from higher quality varieties of wheat (hard varieties which cannot be extensively grown in Europe). Lower prices for consumers (and a gain in consumer surplus) plus lower costs in obtaining wheat from more efficient producers would also be gains. Although producer losses would be significant in the short run, these could be compensated for by more efficient income transfer and structural change programs.

There are other aspects of the CAP on which no dollar value can easily be placed. World welfare costs, including loss of the EEC market for soft

wheat imports, the substitution of high-cost, relatively less efficient EEC sources of supply for low-cost, more efficient world sources of supply for the EEC, and the dumping of subsidized exports on the world market, are difficult to measure, but nevertheless important, especially in light of growing international concern over world food supplies.

In the area of benefits, higher producer incomes under the CAP have meant increased investment in technical improvements in agriculture, higher yields, and possibly lower costs. Guaranteed prices provide long-term assurance and increase ease of planning for the agricultural sector, helping to stimulate production. The CAP has also provided access for French producers (the most efficient of EEC wheat producers) to many EEC member markets, especially Germany. Structural reforms under the CAP, along the lines of the Mansholt Report, could in the long run make agriculture in the EEC more efficient and thus help to reduce costs.

Conclusions and Proposals for Reform

The high costs of the CAP, which for the most part are borne by the consumer and by foreign sources of supply, lead to a reexamination of the net benefits of the CAP. Throughout the 1970's, the EEC states have attempted to revise the policy, but without much success. To a great extent, the CAP remains a highly sensitive domestic political issue. It has been among the most successfully implemented EEC policies, and thus its removal might bring into question the future of the EEC in the absence of agreement on monetary and economic union. As a result, the CAP has stumbled along in the 1970's, increasingly encumbered by protective schemes to compensate for exchange rate alterations.

In referring to the objectives of the CAP as outlined by the Treaty of Rome, it can be seen that the policy has guaranteed regular supplies and increased agricultural productivity. However, supplies have been increased to the point where there are costly surpluses not only in wheat, but also in milk, beef, and wine. Living conditions for the agricultural population, in terms of income, have improved, except in Germany. However, the Mansholt Report indicates that price policies have not been completely adequate to meet the goals, and that structural programs (at increased cost) need to be undertaken. Markets have not been stabilized, especially in the face of monetary disturbances, and consumers, faced with unreasonable food prices, have been pressing for reforms.

Josling³⁷ indicates in his study that alternative protective policies

37. Josling, "The Common Agricultural Policy of the European Economic Community", *op. cit.* and Table 6.

might be considerably less costly (see Table 5, *Estimation of CAP Costs, Marginal and Average*), particularly some sort of direct income payment to producers. It is highly unlikely that the removal of the CAP will result in free trade. Agricultural protectionism is a political welfare policy necessary in most industrial countries, at least politically. While the empirical estimates of costs and benefits presented here are for the case of the CAP vs. free trade, it would be much more likely that the CAP would be replaced by some other form of protection. This is necessary both within the EEC, as member countries might find it necessary to shield their agricultural sectors from more efficient intra-Community producers (Germany and France, for example) and for EEC trade with world suppliers. In discussing proposals for reform, then, the EEC criteria should be to find the least expensive and least distorting form of protection.

In the short run, prices within the EEC need to be brought closer to world prices, to avoid the high costs of subsidizing exports and storing surpluses as well as to promote a more economically rational allocation of resources, especially between food and feed grain production. Compensation for the adjusted prices could be paid to those affected, but in such a way that excessive or marginally productive resources were encouraged to move out of agriculture. Structural programs could increase productivity and help lower costs, as well as move the Community closer to exploiting its comparative advantage. Free trade could be a long term goal coupled with these programs.

APPENDIX

The Wheat Sector in the EEC: A Mathematical Model

This section presents a mathematical model of the soft wheat sector of the EEC, outlining the basic demand and supply relationships and providing an empirical measure of the costs and benefits described graphically above.

Demand for wheat is given by the function:

$$(8) D = D(P_t), \quad \frac{dD}{dP_t} < 0$$

where D is the quantity of soft wheat demanded and P_t is the target price within the Community, as given under the CAP. Since we are interested in measuring the effects of a change in P_t , consumer income is assumed to be held constant. Changes in demand will thus be along the demand curve, rather than shifting the curve.

Supply is the total production of soft wheat within the Community,

given by the function:

$$(9) S = S(P_t, \bar{R}), \quad dS/dP_t > 0$$

where S is the production of wheat in year i , P_t is the target price, and R is the supply of land suitable for soft wheat production, which is taken as fixed for the EEC.³⁸

Net exports are given by the function:

$$(10) X = X(P_t, P_w), \quad \partial X/\partial P_t < 0; \quad \partial X/\partial P_w > 0$$

where X is net exports of soft wheat (total exports-total imports) and P_w is the world price. Since the variable levy is the difference between the EEC target price and the world price, and the subsidy for grain exports from the EEC is the negative of this variable levy, equation (10) can be rewritten as:

$$(11) X = X(P_t - L)$$

where L is the variable levy (or subsidy) such that $L = P_t - P_w$.

The equilibrium condition for the sector is:

$$(12) S(P_t, \bar{R}) - X(P_t - L) + I = D(P_t)$$

I is an exogenous variable denoting inventories or stocks of soft wheat for year i .

Taking total differentials of equation (12):

$$(13) \frac{dS}{dP_t} dP_t - \frac{dX}{dP_t} (dP_t - dL) - dI = \frac{dD}{dP_t} dP_t$$

Rearranging terms:

$$(14) dP_t = \frac{-dX/dP_t dL + dI}{dS/dP_t - dX/dP_t - dD/dP_t}$$

Substituting for elasticities, where ϵ is the elasticity of demand with respect to P_t , η is the elasticity of supply with respect to P_t , and θ is the elasticity of exports with respect to P_t :

$$(15) dP_t = \frac{-X\theta dL}{S\eta - X\theta - D\epsilon} + \frac{P_t dI}{S\eta - X\theta - D\epsilon}$$

dP_t is the change in the price of soft wheat within the EEC resulting from the removal of the variable levy. dL is the size of the variable levy

in year i , and dI is the size of stocks of soft wheat in year i . Thus, there are two effects upon dP_t .

The first is the effect of removing the variable levy dL :

$$(16) \frac{-X\theta dL}{S\eta - X\theta - D\varepsilon}$$

The second is the effect of varying the size of stocks of soft wheat (I).

$$(17) \frac{P_t dI}{S\eta - X\theta - D\varepsilon}$$

As noted previously, the EEC, in buying surplus grain, can dispose of it on the Community market, can export it (at a subsidized price or denatured as feed) or can hold it as reserve stocks.