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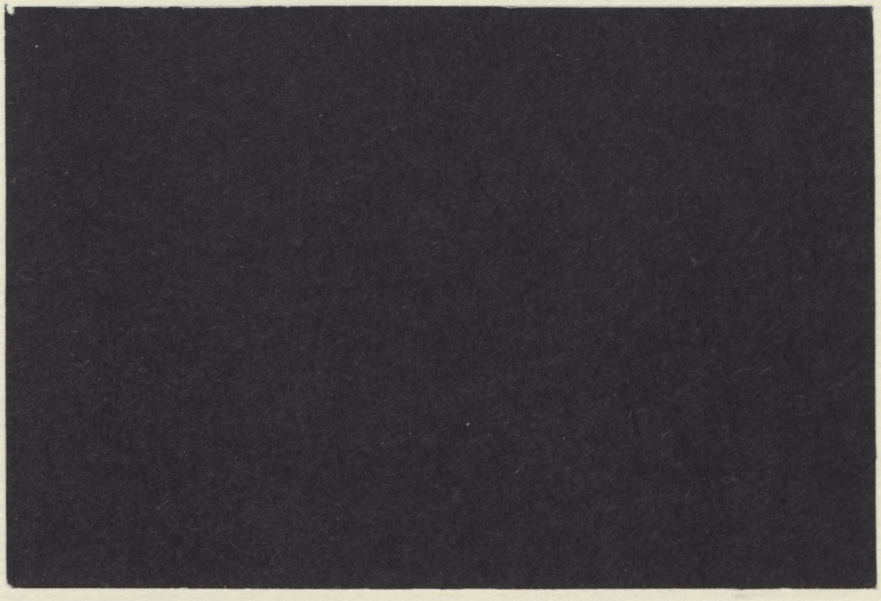

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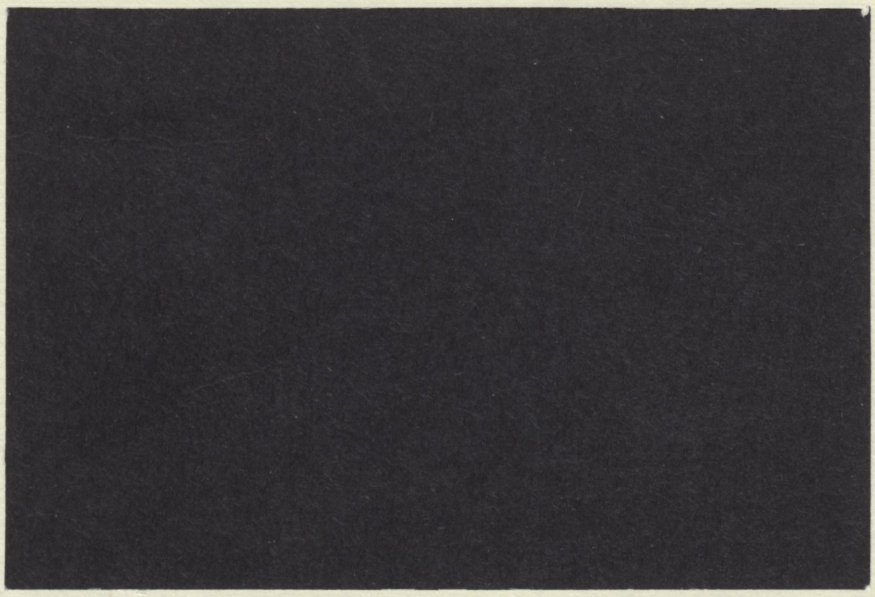

Impacts of EEC Policies on U.S. Export Performance in the 1980's.

William H. Meyers, R. Thamodaran and Michael Helmar

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Impacts of EEC Policies on U.S. Export Performance in the 1980's

William H. Meyers, R. Thamodaran and Michael Helmar*

The 1970s was a decade of rapid growth in exports, farm income and land values for agriculture. The rate of inflation was high, real interest rates were low and the U.S. dollar was weak relative to many foreign currencies. Expectations were that export growth would continue to require full production in the U.S. most of the time and would keep the cost of the various government price and income programs low.

In the 1980s, the economic environment changed drastically. The economic policies which successfully wrung inflation out of the U.S. economy also created a recession here and in many foreign countries. U.S. inflation rates fell more rapidly than interest rates, causing real rates of interest to rise. As foreign investors bought dollars to invest here and earn these high returns, the dollar appreciated and made our exports more costly abroad. The world economic recession, combined with high real interest rates and an appreciating dollar, contributed to debt and credit problems in many third world economies. All of these factors contributed to a substantial decline in U.S. agricultural exports from its peak in crop year 1980/81. Added to this weak demand, the bumper crops in the U.S. in 1981 and 1982 and the high real interest costs to farmers set the stage for substantial declines in farm prices, incomes and asset values.

The reversal of conditions that existed in the 1970s could hardly be more complete. Current conditions may or may not prevail as long as those that existed in the 1970s, but much of the political pressure for policy action will be based on these conditions.

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The government programs designed to dampen the peaks and valleys of farm prices and incomes have become much more costly as these conditions have continued. Political pressures to increase traditional commodity program assistance or develop new financial assistance programs for farmers under severe financial stress (Holding) are clashing with pressures to cut the Federal budget deficit and reduce government support for agriculture. Meanwhile, attention is also focused on identifying the factors that underlie the current problems in agriculture and assessing their future direction. Since the growth and decline of agricultural exports has been an important factor in the prosperity of the 1970s and the distress of the 1980s, trade factors are among the most frequently mentioned causes of the current problems in agriculture. The factors cited include foreign supply and demand growth, exchange rates, grain embargoes and the policies of foreign governments.

The focus of this paper is to evaluate the importance of the EEC Common Agricultural Policy (CAP) relative to other factors in terms of influence on U.S. exports and commodity prices. We limit ourselves to grains and soybeans, which have been the focus of much of the conflict between the U.S. and the EEC. The comparative factors are exchange rates and foreign income growth, which are considered major determinants of export demand for U.S. farm products. We first review the U.S. export performance from 1970-1984. Second, EEC and U.S. policies and their potential trade consequences are reviewed. Third, we present quantitative estimates of the impact on U.S. exports and prices of changes in foreign income growth, U.S. exchange rates and EEC support prices.

U.S. Export Performance 1970-1984

Exports have been a major factor in agricultural prosperity and distress not just for the past decade but for the past century. However, the rise and fall of exports has usually been a consequence of factors outside the reach of

agricultural policies. The most recent example is seen in Table 1. Grain exports of the U.S. grew at the rate of 11 percent per year in the 1970s and declined at a rate of more than 5 percent per year for crop years 1980/81 to 1983/84. What were the factors behind these changes?

U.S. agriculture responded rapidly to the dynamic export market growth of the 1970s. World grain trade nearly doubled in the 1970s, and the U.S. provided about 70 percent of the grain needed to meet this demand. As a consequence, the U.S. expanded its market share of grain trade from 37 percent in 1970 to a high of 56 percent in 1979. Much land that was idled by government programs in the 1960s was brought back into production, cropland and irrigation was expanded, and productivity was increased. As a result, U.S. agriculture became more dependent on export demand, which is far less stable and predictable than domestic demand.

This pattern of export growth reversed after the 1980/81 crop year. World grain trade declined by more than 5 percent, and U.S. exports by 15 percent. The U.S. share of trade declined and the value of U.S. agricultural exports fell by more than 20 percent. In the case of coarse grains (Figure 1), the U.S. absorbed 76 percent of the 17.7 mmt decline in world exports between 1980 and 1983. For wheat, which peaked in 1981 (Figure 2), U.S. exports declined while world trade was stagnant in this period. Thus, other countries increased their exports. The decline in total world trade appears to be largely caused by the slowing economic growth worldwide and the sharply curtailed credit availability and higher credit costs for many developing countries and Eastern Europe.

The additional decline in the U.S. share of grain trade can be attributed in part to the U.S. dollar appreciation (Figure 3) and the effects of domestic

Table 1. Total grain trade, U.S. trade share and growth rates.

Crop Year	Total	U.S.	Other	U.S. Share
	Million Metric Tons			
1970	109.6	40.3	69.3	36.8
1971	110.0	42.3	67.7	38.5
1972	134.6	70.8	63.8	52.7
1973	141.7	75.4	66.3	53.2
1974	136.8	65.8	71.0	48.2
1975	150.4	83.7	66.7	55.7
1976	157.8	78.6	79.2	49.9
1977	171.4	89.2	82.3	52.2
1978	176.9	95.1	81.8	53.8
1979	198.2	111.5	86.7	56.3
1980	216.2	113.7	102.5	52.6
1981	211.9	109.5	102.4	51.7
1982	201.7	97.3	104.4	48.4
1983*	205.3	96.9	108.4	47.2
1984*	217.3	104.8	112.5	48.2
Average Annual Growth Rate (% per year)				
1970-80	7.0	10.9	4.0	3.7
1980-83	-1.7	-5.2	1.9	-3.7

Source: USDA, For. Agr. Circular, FG-10-84 (excludes intra EC-9 trade)

*preliminary

WORLD AND U.S. WHEAT TRADE

1970–1984

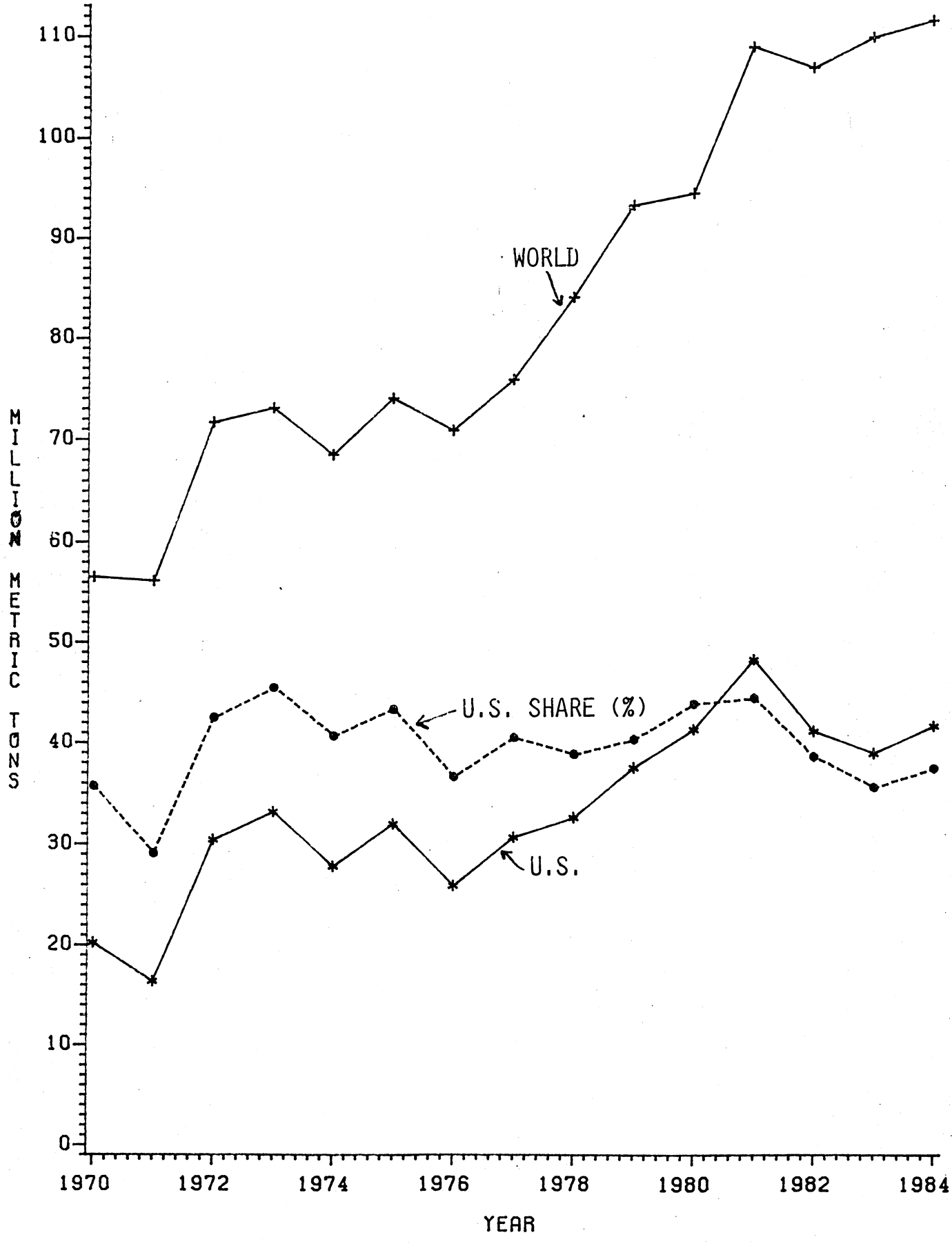
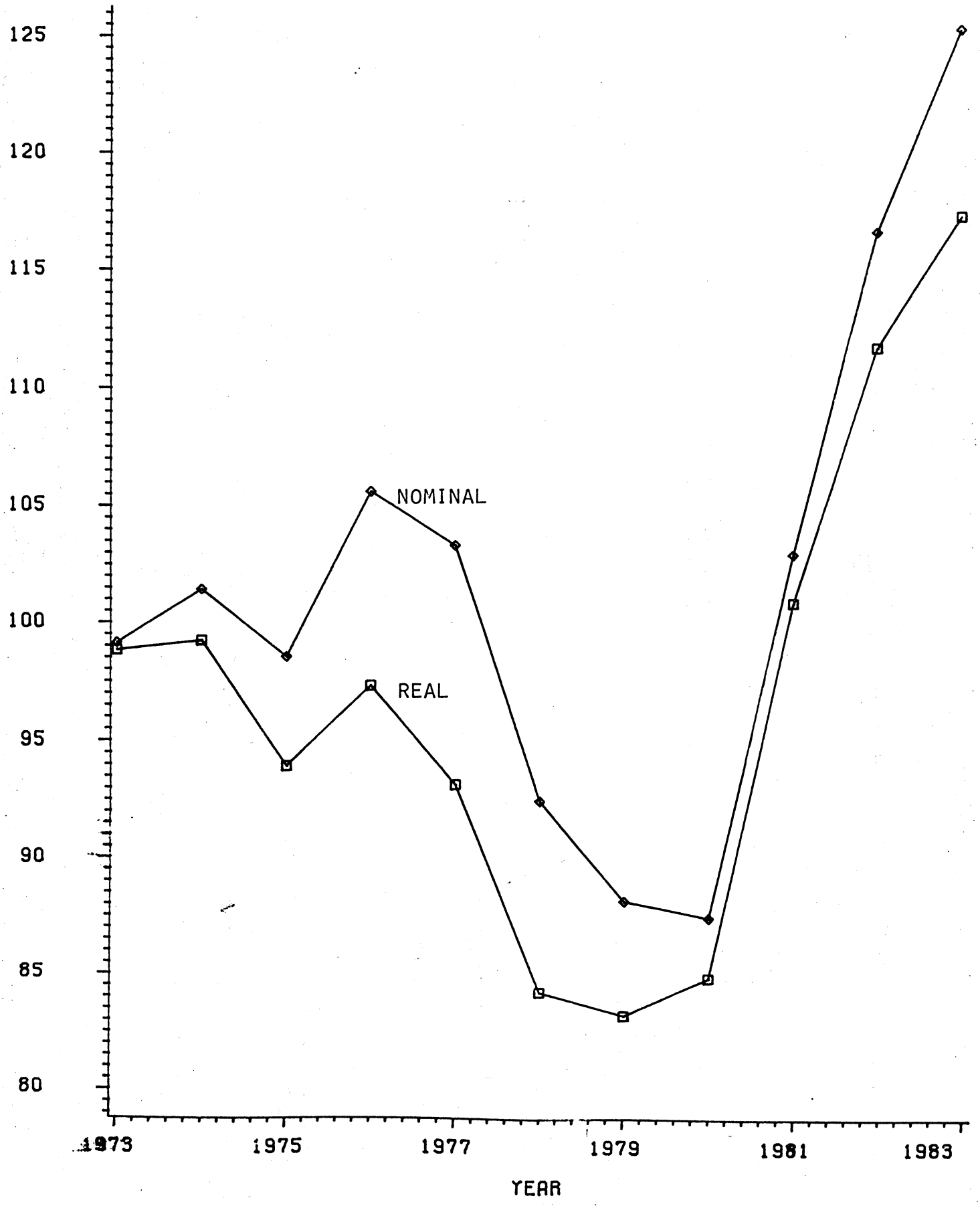


FIGURE 2

FIGURE 3

TRADE WEIGHTED VALUE OF U.S. DOLLAR

(MARCH 1973=100)



agricultural and related trade policies in the U.S. and key foreign countries.[1] The U.S. trade share, especially for coarse grains, tends to rise and fall with total trade. This is partly a consequence of being a large rather than a small exporting country, but it is also policy related. U.S. acreage and reserve programs make export supplies more responsive to changing foreign demand. Many smaller exporters, including the EEC, have policies which insure that they export whatever exceeds domestic use regardless of world market conditions. Both of these types of policy tend to make the U.S. market share fall (rise) when total trade falls (rises).

A more detailed picture of the world supply and demand conditions that accompanied the declines in U.S. exports is presented in Table 2. The two years of largest declines in U.S. exports are examined for coarse grains and wheat. The coarse grain export decline from 1980 to 1982 was associated with a large decline in USSR imports and smaller but substantial declines in Eastern Europe and EEC imports. Increased production partially explained the reduced imports. Three of the other exporters reduced exports as production fell, and in Canada the reverse was true. The U.S. market problem is evident in the fact that production rose substantially while exports declined. This led to the costly (PIK) supply control program of 1983/84.

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[1]The embargo of shipments to the USSR in 1980 has not been mentioned among these causes, because it did not alter the fundamental demand and supply in the world. The year following that embargo U.S. exports reached a record high, and in the three years since the embargo was lifted exports have declined. The 1980 embargo and more recent strained relations with the USSR has primarily influenced who they import from not how much they purchase. It is the total purchase which influences total grain demand and prices.

Table 2. Changes in imports, exports and production of major trading areas in the two years when U.S. exports were falling the most.

	Change (mil. m.t.) 1980/81-1982/83	
	Net Exports	Production
Coarse Grains		
Net Exporters	-19.8	42.1
United States	-15.5	52.4
Argentina	- 2.9	- 2.8
South Africa	- 2.5	-10.8
Australia	- 1.4	- 1.3
Canada	2.5	4.6
	Net Imports	
Net Importers	-19.8	4.8
USSR	-12.5	5.5
Eastern Europe	- 6.5	10.4
EC 10	- 4.2	1.9
China	1.7	- 0.7
S. Korea and Taiwan	2.4	0.0
Others	- 0.7	-12.3
World	---	46.9
	Change (mil. m.t.) 1981/82-1983/84	
Wheat	Net Exports	Production
Net Exporters	+ 1.1	6.0
United States	- 9.9	- 9.9
Australia	+ 0.6	5.5
EC-10	+ 1.6	4.9
Canada	+ 3.5	1.8
Argentina	+ 5.3	3.7
	Net Imports	
Net Importers	1.1	34.2
China	- 3.6	21.8
Eastern Europe	- 2.2	4.8
USSR	1.0	- 2.0
Others	5.9	9.6
World	---	40.2

Source: USDA, For. Agr. Circular, Grains, FG-13-84, October 1984.

The U.S. wheat export decline of 1981 to 1983 occurred while foreign demand was flat but other exporters were shipping more. Canada and Argentina, in particular, made up most of the difference while the EC-10 took a small share. These, again, were partially in response to production changes. In the case of the U.S., it is more accurate to view the production decline as a consequence of the falling exports. Most of the export drop occurred in 1982, and domestic stocks absorbed the surplus. The production decline in 1983 was a result of the costly (PIK) supply control program, designed to reduce surplus stocks.

The decline in EEC demand for coarse grains and its increase in supply of wheat are contributing factors to the U.S. farm problem. However, the evidence suggests there are numerous other factors that are equally or more important. Weak demand and growing production is evident in many areas, including the United States.

Many of the factors in the recent export declines are directly or indirectly the consequence of macroeconomic factors and are outside the influence of agricultural policy. Considering the factors associated with the export decline, the export slide appears to be temporary. Positive growth in exports is expected over the next decade, but most projections expect growth in the range of 2 to 5 percent per year compared with the 10.9 percent rate experienced in the 1970s (Womack, et al.). This kind of export performance would mean relatively little improvement in average crop prices, given normal weather. Thus, the conflicts that arise from competition over limited markets are likely to continue unless some accommodations are reached.

EEC and U.S. Agricultural Policies and Trade

It has already been noted above that agricultural policies influence and are influenced by trade. It is widely recognized that most trade restrictions on agricultural commodities are dictated by domestic agricultural programs. Thus, any efforts to negotiate on these trade policies must first deal with the domestic policy realities. In our investigation it is also important to consider how policies affect the supply of and demand for commodities.

EEC policies

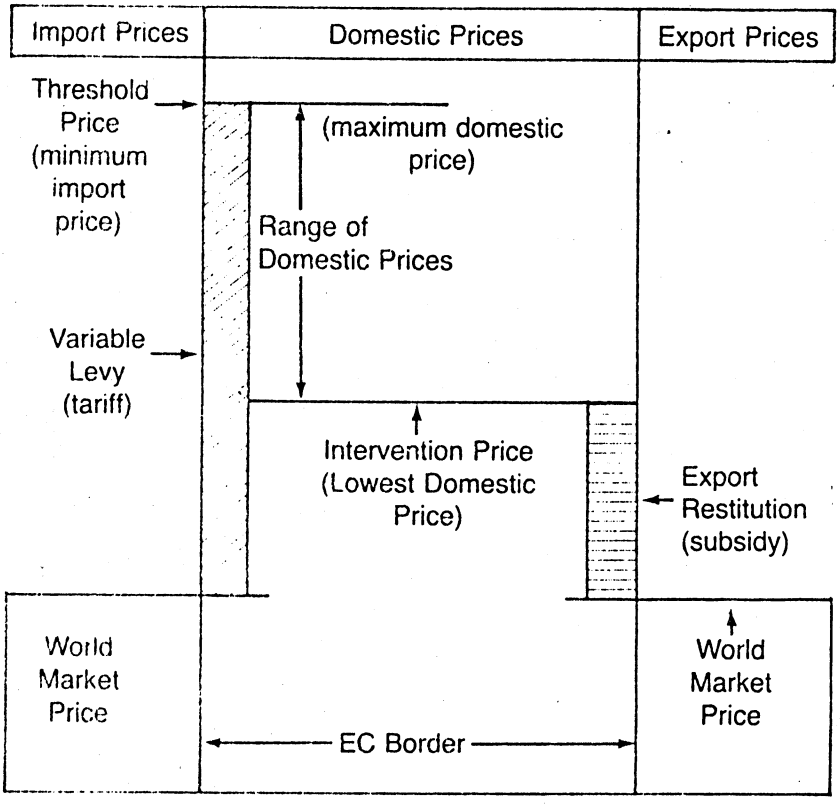
Other papers will deal in more detail with the CAP. For our purposes the basic features of the CAP for grains are illustrated in Figure 4. A "target" price is set as the domestic price objective for income support.

From this price a minimum import (threshold) price and a minimum domestic (intervention) price are set. The threshold price is enforced with a variable levy system. The intervention price is protected by storage operations or export subsidies. This system applies to all grains but not to soybeans, soybean meal or other feed ingredients like corn gluten meal or manioc.

This policy, by holding prices above border prices, stimulates supply of the products and reduces demand. From the point of view of exporters like the U.S., such policies reduce market demand. However, one aspect of the policy has benefited the U.S. and a few other exporters. The high grain prices have made freely traded soybeans and soymeal more attractive as feed ingredients. Thus coarse grain consumption has been stagnant or declining since 1970, while soybean use has more than doubled.

Exchange rate effects are also distorted by these policies. For grains, where prices are fixed domestically, exchange rate changes relative to external countries will not have an impact unless it influences the price fixing

Figure 4. The CAP Grain Market Price System



Note: Adapted from Policy Options for the Grain Economy of the European Community, Research Report 35, International Food Policy Research Institute, Nov. 1982.

decisions. But since the feed industry reacts to the relative prices of feed grains and soybeans, a weaker U.S. dollar makes the soybeans-grain price ratio lower and would lead to more soybean and less coarse grain imports.

Finally, policies of this type which insulate and stabilize domestic market prices, tend to destabilize the remaining markets. Thus, through the variable levy system, the EEC exports its domestic supply and demand instability and does not help to absorb any of the supply or demand shocks that occur elsewhere in the world.

U.S. Policies

Wheat and coarse grains, like other major crops, are influenced by a set of price and income support and stabilization programs. The loan rate sets an approximate floor on season average price for all producers, even though it is only available to program participants. The effective minimum price for participating producers is better reflected by the higher target price, which is guaranteed through a direct payment. The Farmer-Owned Reserve Program encourages farmers, through storage and interest subsidies, to store more grain when prices are low and sell when prices are high. The reserve release is the price at which participants are permitted (but not required) to market reserve stocks. It approximates a price ceiling for the market when there are large reserve stocks and expectations of weak prices in the future. The difference between the loan rate and release price also approximates the participant's expected gain from storage, since costs of storage are largely covered by government payments. Finally, acreage reduction programs are used to reduce excessive stocks or raise market price to reduce direct payment costs. Only participants in acreage reduction programs are eligible for the other programs.

The levels of the loan, target and release prices relative to market price for wheat and corn are shown in Figures 5 and 6, respectively. The loan rate has been an effective price floor in recent years. Direct payment cost exposure is increasing, especially for wheat, as market and target prices diverge. There is little chance of the wheat market price reaching the high release level, so wheat in the reserve is being used in lieu of diversion payments (in the PIK program) to pay producers for acreage reduction.

The target price program, by providing producers a price above the market prices, stimulates supply. Since it is a direct payment scheme, however, it does not reduce demand. Other exporters view this program as an implicit subsidy on exports, and the argument holds as well for domestic consumers. Acreage reduction programs offset these implicit subsidies to the extent that they reduce supply and raise market prices. The loan and reserve programs stabilize world as well as U.S. prices and increase the U.S. export supply elasticity. That is, export supplies are more responsive to changing market conditions.

Policy and Trade Comparisons

Although EEC support prices have been substantially above those in the U.S., the appreciation of the U.S. dollar since 1980 has brought them closer. In Figure 7, French and German corn intervention prices in U.S. dollars are seen to be rising as much or more than U.S. loan and target prices up to 1981. After that they begin to converge. In the case of wheat, the target and intervention prices begin to converge after 1975, and the French intervention price drops below the target price after 1981 (Figure 8). The EEC does not maintain the large difference between wheat and coarse grain support levels that has been the case in the United States.

The patterns of production and trade growth are shown in Figures 9-12. Before 1974, wheat production levels in the U.S. and the EC were very similar

FIGURE 5

WHEAT LOAN RATE, TARGET, RELEASE, AND FARM PRICES

(1967–1984)

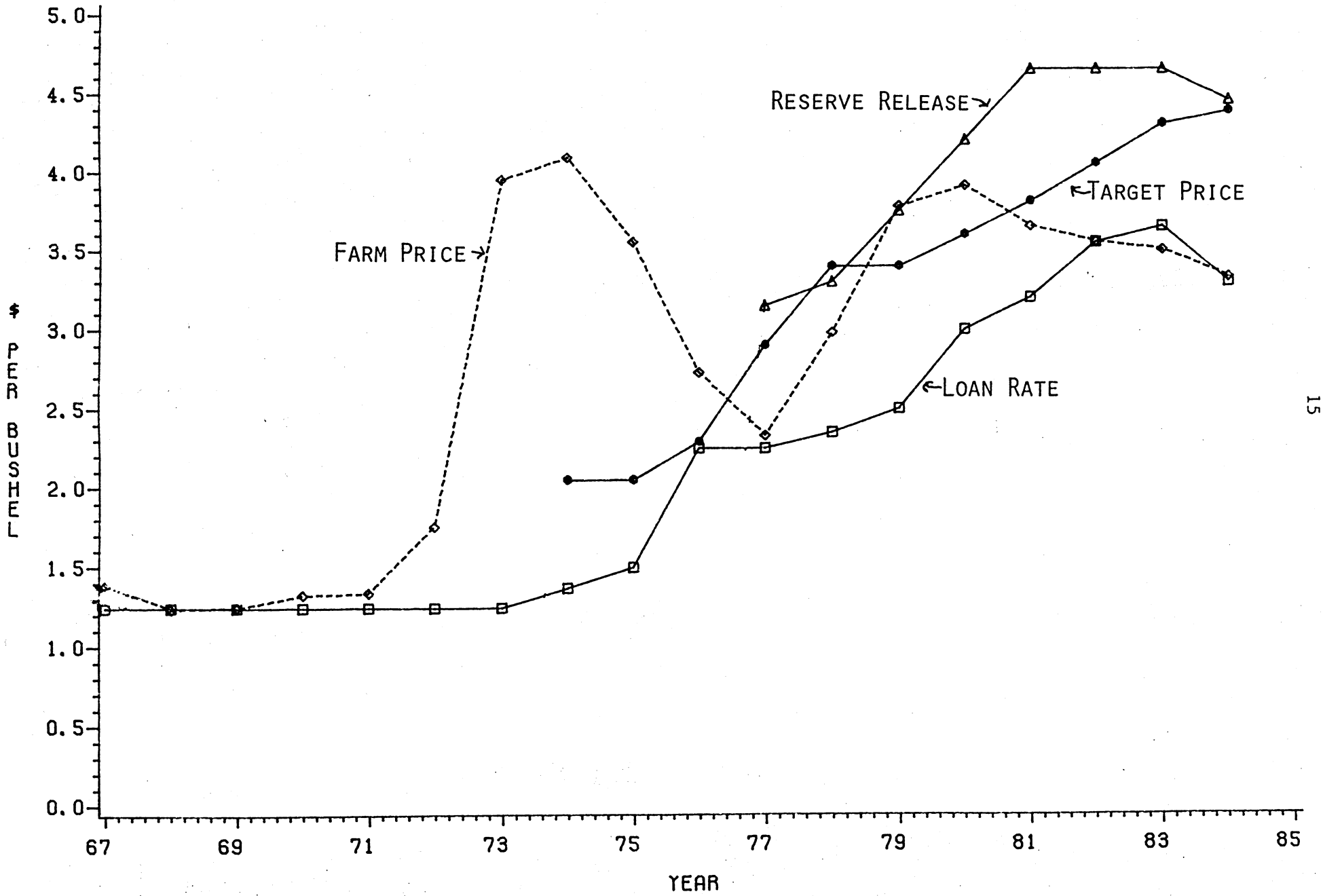


FIGURE 6

CORN LOAN RATE, TARGET, RELEASE, AND FARM PRICES

(1967–1984)

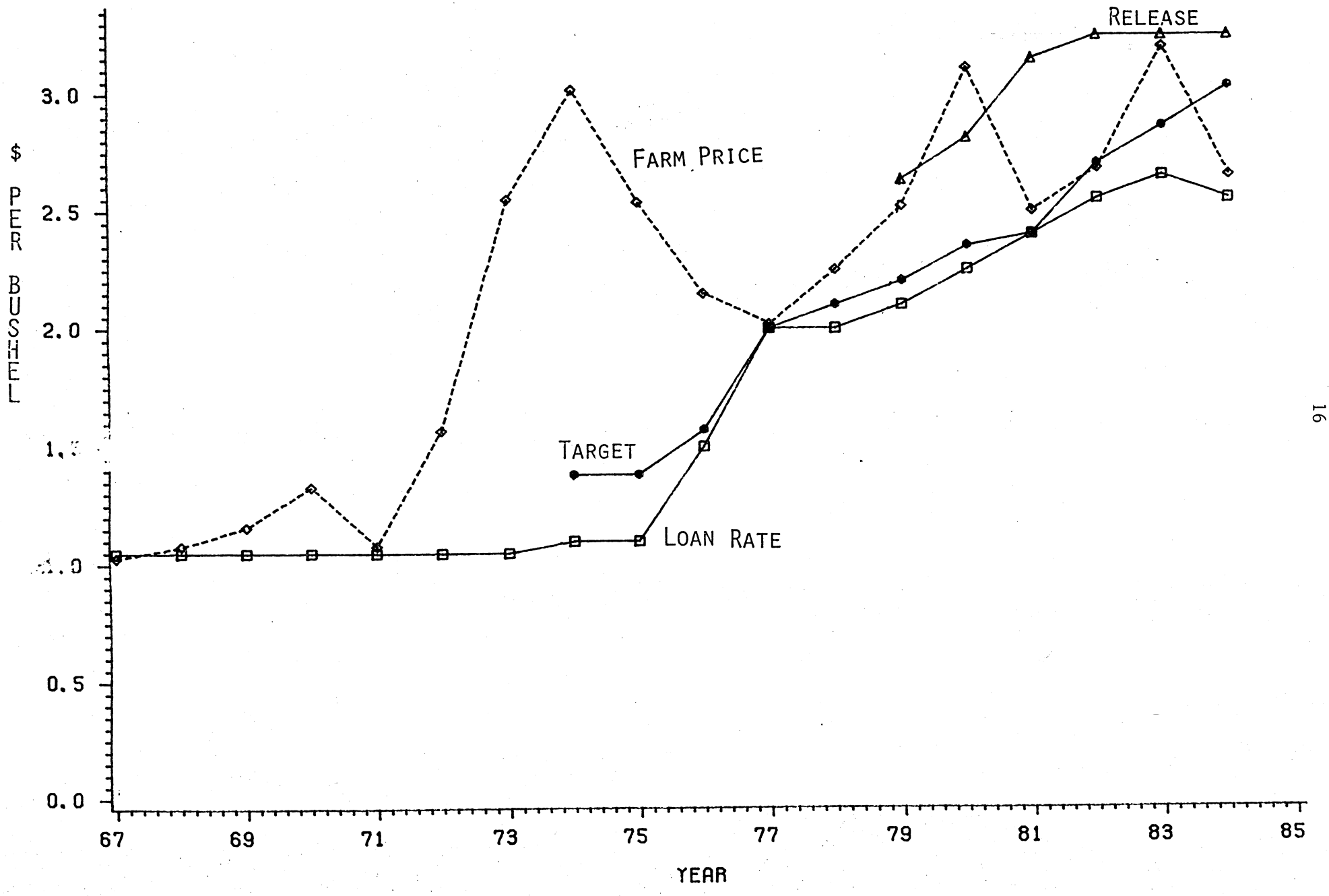


FIGURE 7

CORN SUPPORT PRICES

(1970–1984)

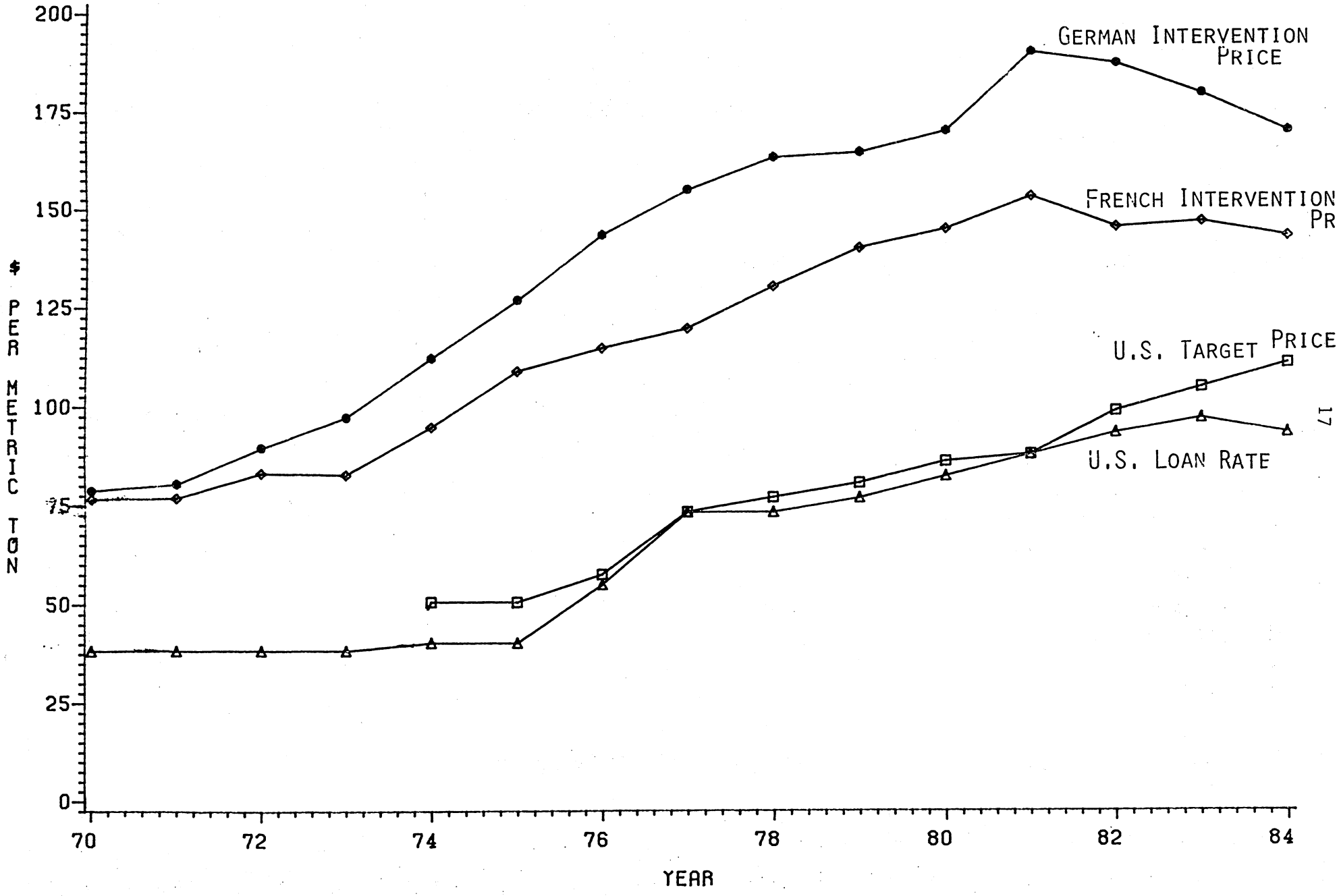
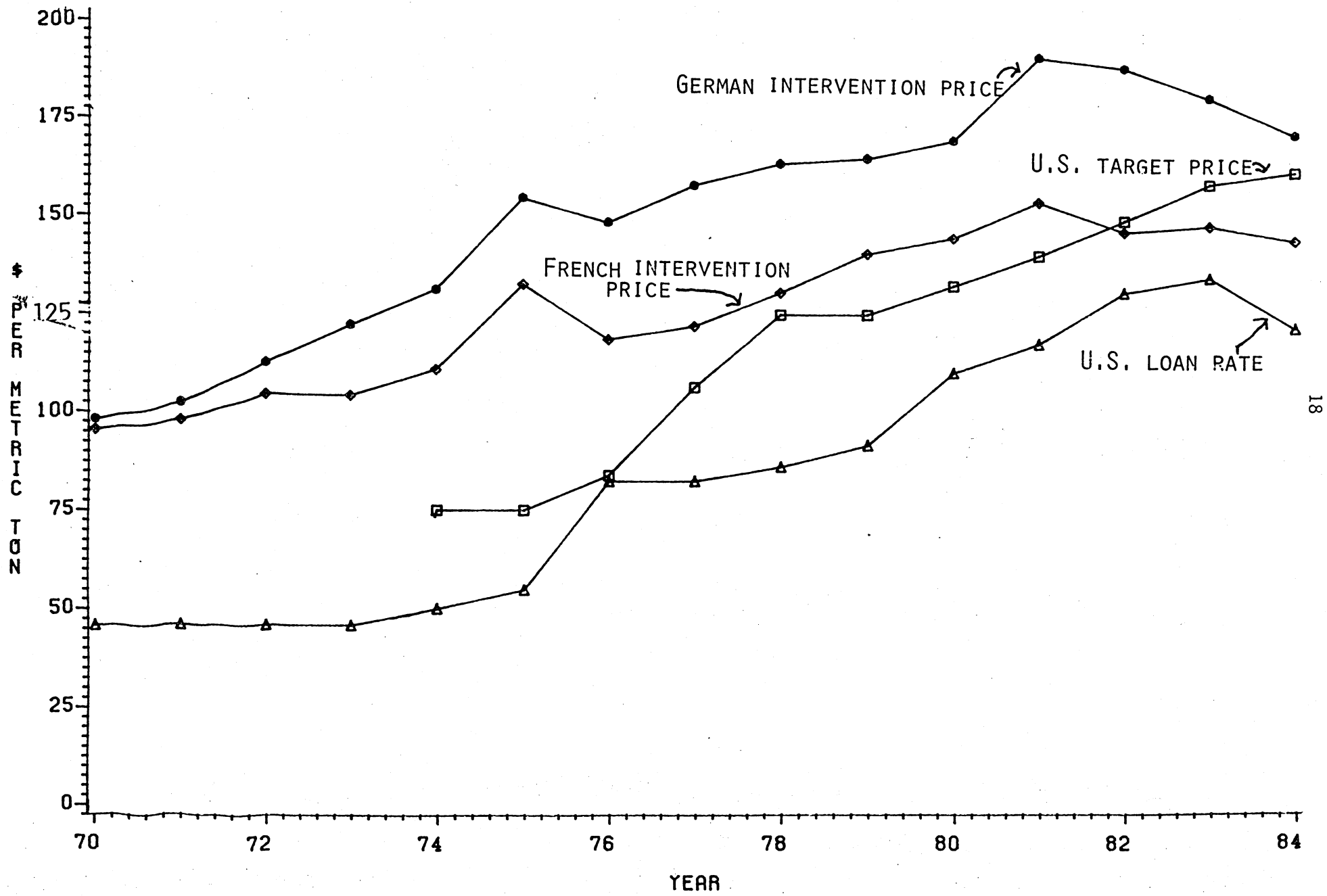


FIGURE 8

WHEAT SUPPORT PRICES

(1970–1984)



(Figure 9). Since then, U.S. production has been growing more rapidly than that of the EC. Years when production levels have converged tend to be years of sizeable acreage reduction programs in the United States. Most growth in the U.S. was due to expanded area, while EEC production growth largely came from yield increases. Both were influenced by the level of prices, as we will report in the next section.

Production growth in the U.S. made possible large expansion in exports, while the EEC reduced its imports and then became a net exporter after 1973 (Figure 10). This has increased the concern in the U.S. over the support levels maintained in the EEC and the subsidies that are made on exports.

Coarse grain production growth in the EEC has not been as rapid as that of the U.S. (Figure 11) nor as rapid as EEC wheat. Nevertheless, the EEC is projected to be a net exporter of coarse grains in 1984 for the first time (Figure 12). Aside from the modest production growth, substitution of other feed ingredients for high priced grains is an important factor in this development.

Comparison of Demand and Policy Factors

A source of much concern to U.S. policy makers is the extent to which the EEC has reduced its imports of U.S. grains and has become an export competitor in third markets. Especially in recent years when foreign markets have been stagnant or shrinking and U.S. surpluses have been piling up, the EEC policy has often been high on the list of cited causes. In order to gain some perspective on the importance of EEC price policies relative to other factors, we compare the impact of these with two other often cited factors--income growth and exchange rates. This analysis is not meant to be conclusive with respect to magnitudes of impacts but rather to indicate the relative importance of the factors.

Figure 9

WHEAT PRODUCTION

(1967–1984)

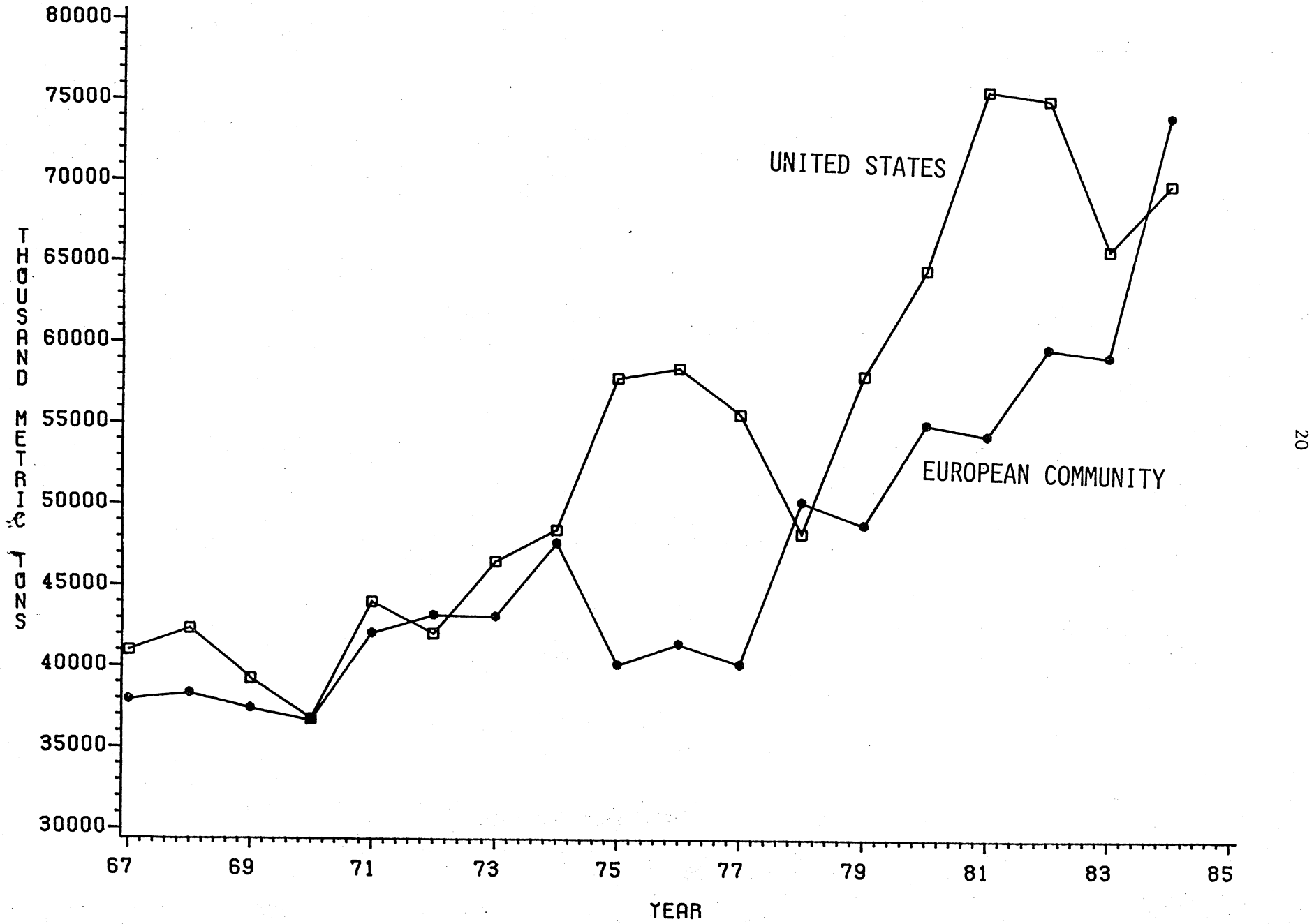


FIGURE 10

WHEAT NET EXPORTS

(1967-1984)

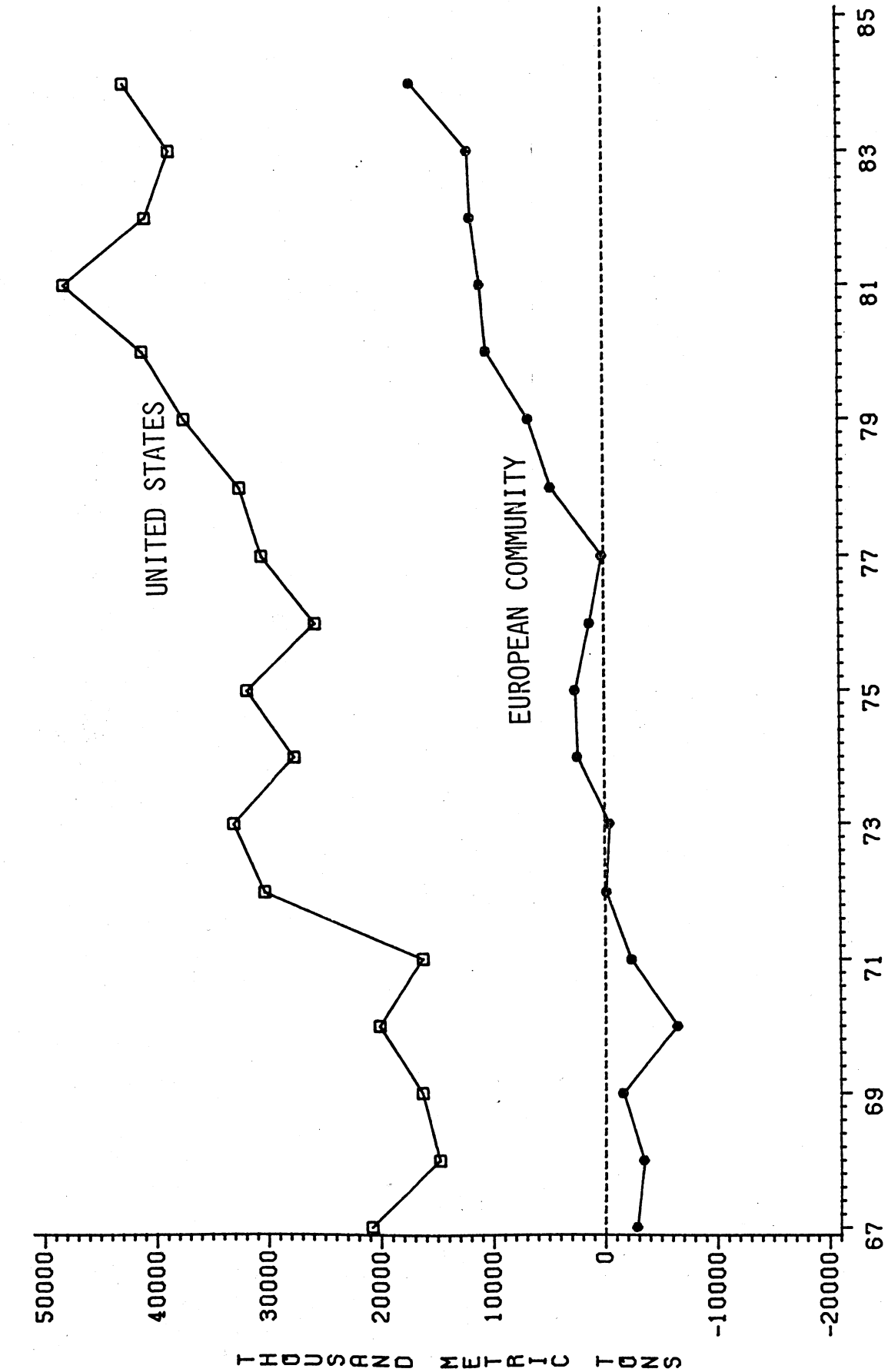


FIGURE 11

COARSE GRAIN PRODUCTION

(1967–1984)

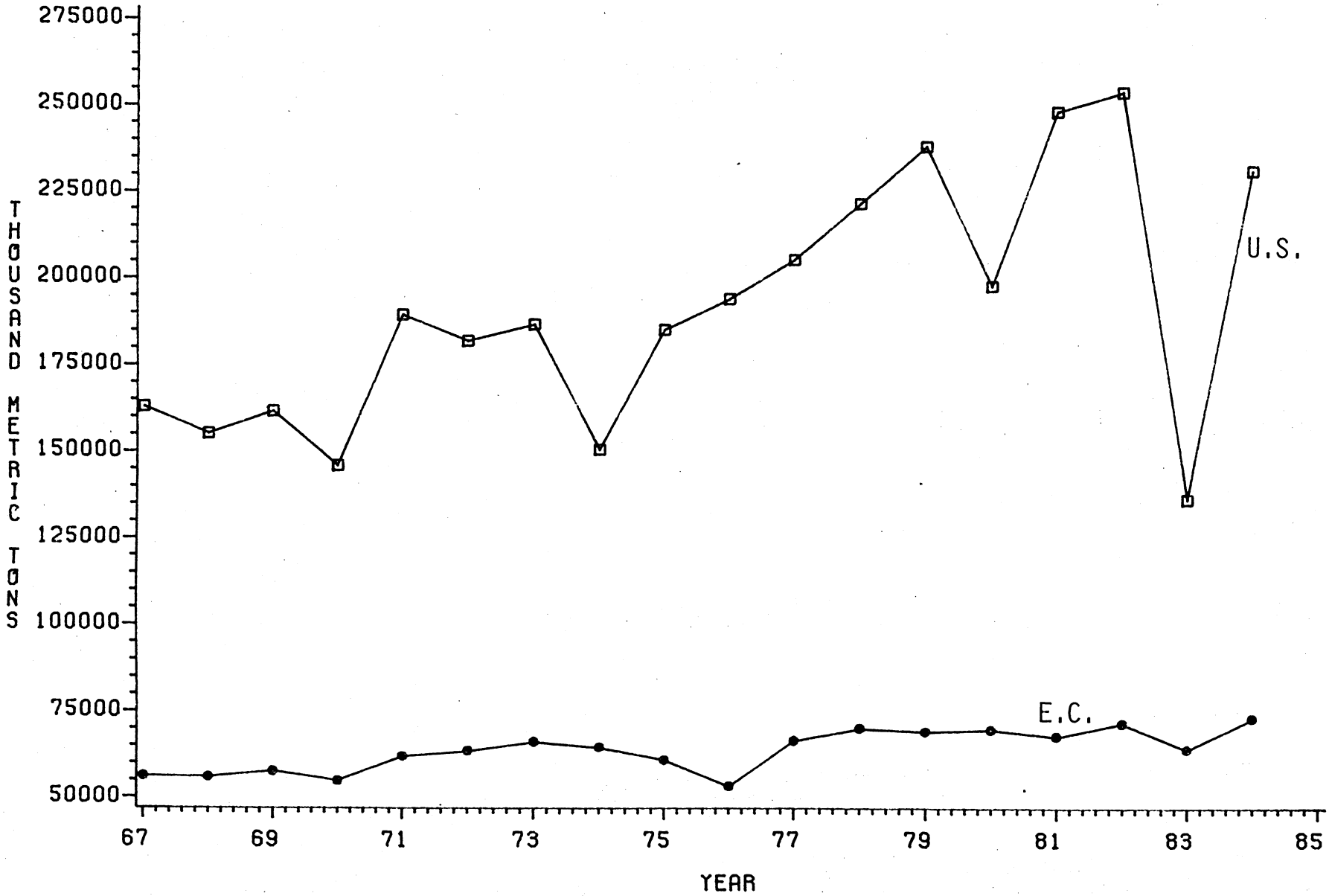
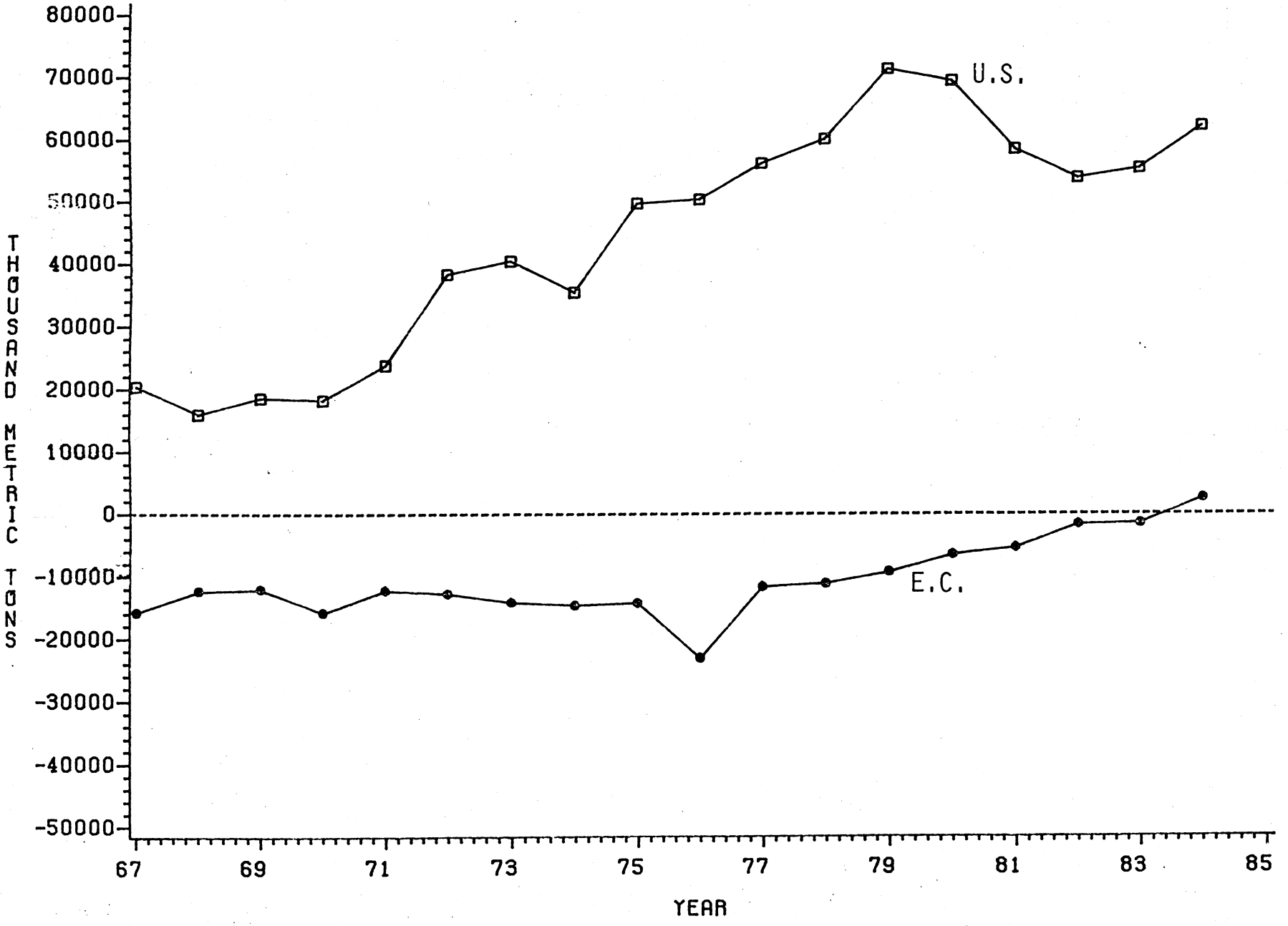


FIGURE 12

COARSE GRAIN NET EXPORTS

(1967-1984)



Supply Response to EEC Prices

One of the key questions in any discussion of the CAP pricing policy is the extent of the supply response to these prices. In order to measure this relationship for corn, barley and wheat, we related the yield of each crop to a technology trend and the ratio of its price to the fertilizer price. In the case of wheat and corn this was a good relationship. In the case of barley it was area harvested rather than yield that we found to be responsive to price.

The results are presented in the form of elasticities in Table 3. The corn response is the highest, primarily because it started from a lower level. As corn production has increased, the percentage response to a 1 percent increase in price changed from .75 percent in 1970 to .4 percent in 1980. The supply response elasticities for coarse grains (.24) and wheat (.37) in 1980 are similar in magnitude to those that have been estimated for the U.S. These magnitudes suggest that a 10 percent reduction in the threshold price levels would result in a 2.4 percent and 3.7 percent decline in coarse grain and wheat production in the EEC. These effects would largely come as the result of reduced input levels. These relationships are used in the analysis which follows.

Table 3. Estimated coarse grain and wheat production response elasticities for the European Community

European Community	1970	1980	1967-80 Average
Barley	.116	.178	.15
Corn	.752	.400	.57
Coarse Grains	.319	.242	.25
Wheat	.442	.374	.42

Impact Comparisons for Soybeans, Wheat and Coarse Grains

As noted above, the soybean is not a protected commodity in the EEC but the level of grain prices affects its use in feed. As grain threshold prices increase, demand for soybeans increases. Thus, as the primary exporter of soybeans, the U.S. soybean industry has benefited from these higher threshold prices. Wheat and coarse grains would be expected to benefit from a reduction in EEC threshold prices. We expect that all three of these sectors have been negatively impacted by the trade effects of the strong U.S. dollar and the slow economic growth in the 1980s.

Our approach in this analysis is to simulate the period 1979-83 under differing assumptions. The base simulation is made with actual EEC policies, exchange rates, and income levels. Then three alternatives are simulated and compared with the base. The alternative assumptions are:

1. Hold the EEC threshold prices at the 1978 level.
2. Hold all exchange rates at the 1978 level.
3. Let income growth of all countries be the rate achieved in the 1970s.

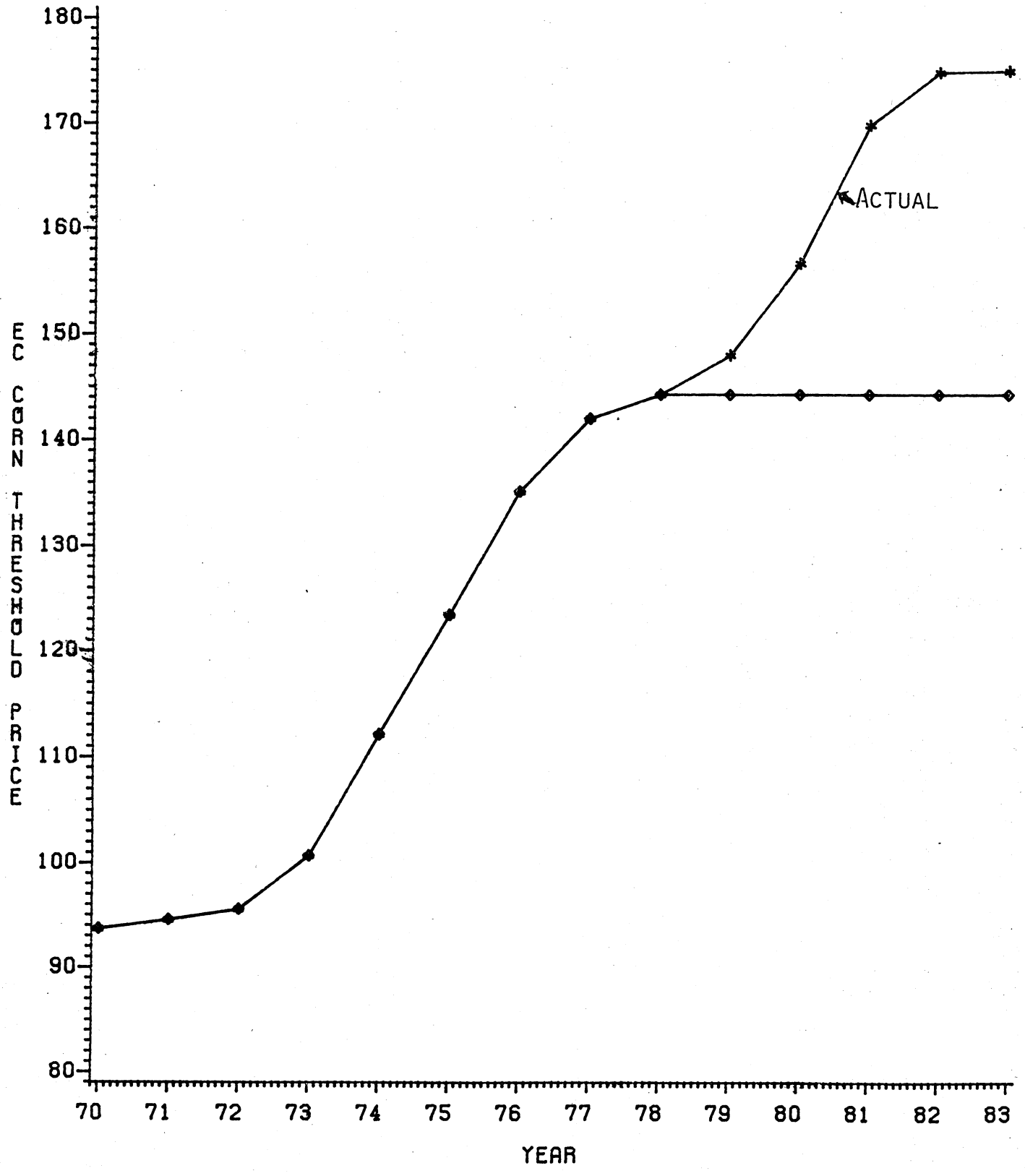
The alternative scenario assumptions are illustrated in Figures 14-16. Similar exchange rate and income changes were assumed for other regions in the model. In each case the results of the base simulation were subtracted from the results under the alternative assumption. The difference measures the impact of the alternative assumption on supply, demand and prices in the model. The average impact in the last two years of the simulation is reported to capture the dynamic supply effects.

Different models are used for each commodity, incorporating the major importing and exporting regions. Brief descriptions of the soybean, wheat and coarse grain models are given in the Appendix.

FIGURE 14

EC CORN THRESHOLD PRICE

(UA/MT)



ACTUAL=STAR
IMPACT=DIAMOND

FIGURE 15

EC EXCHANGE RATE

(UA/$US)

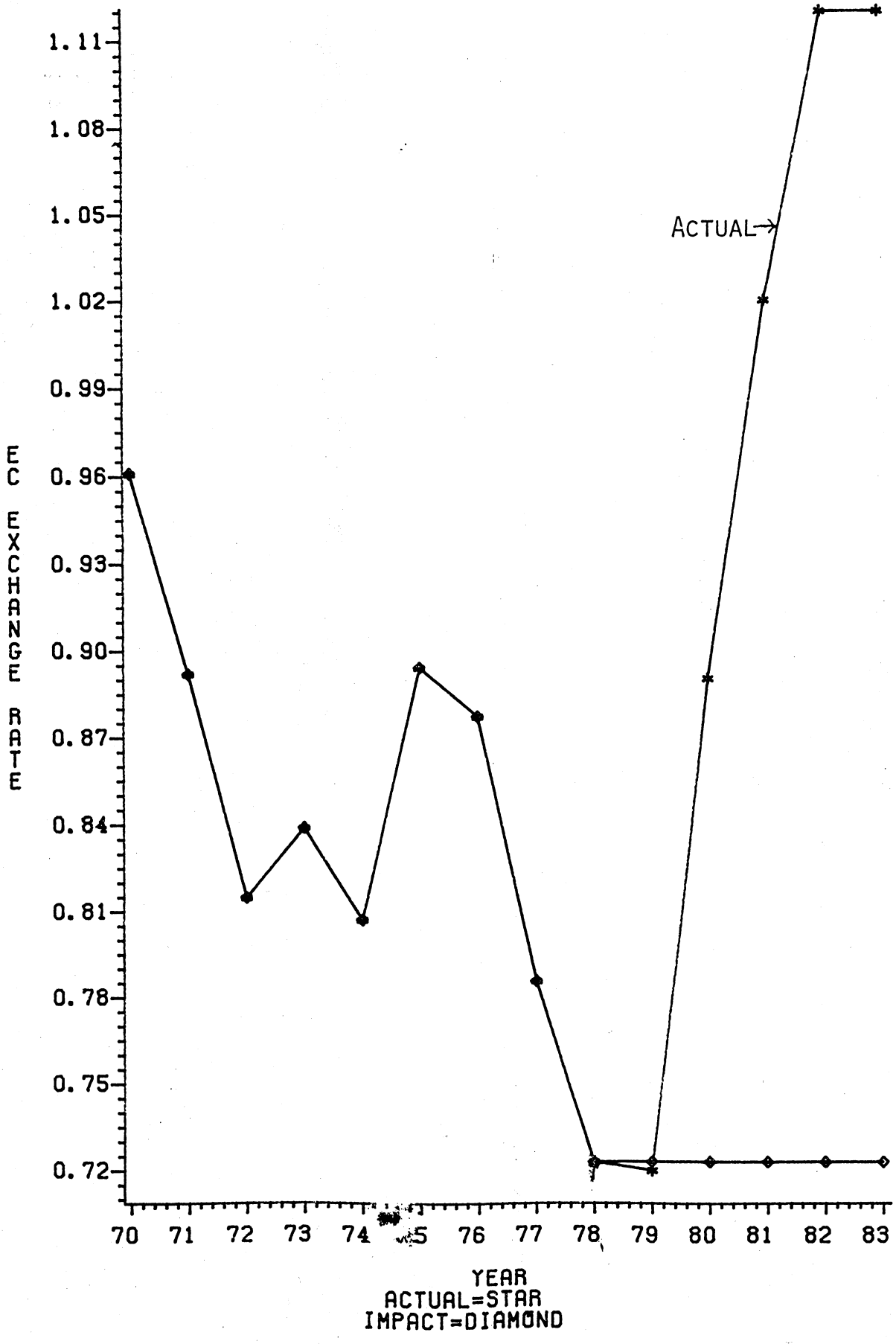
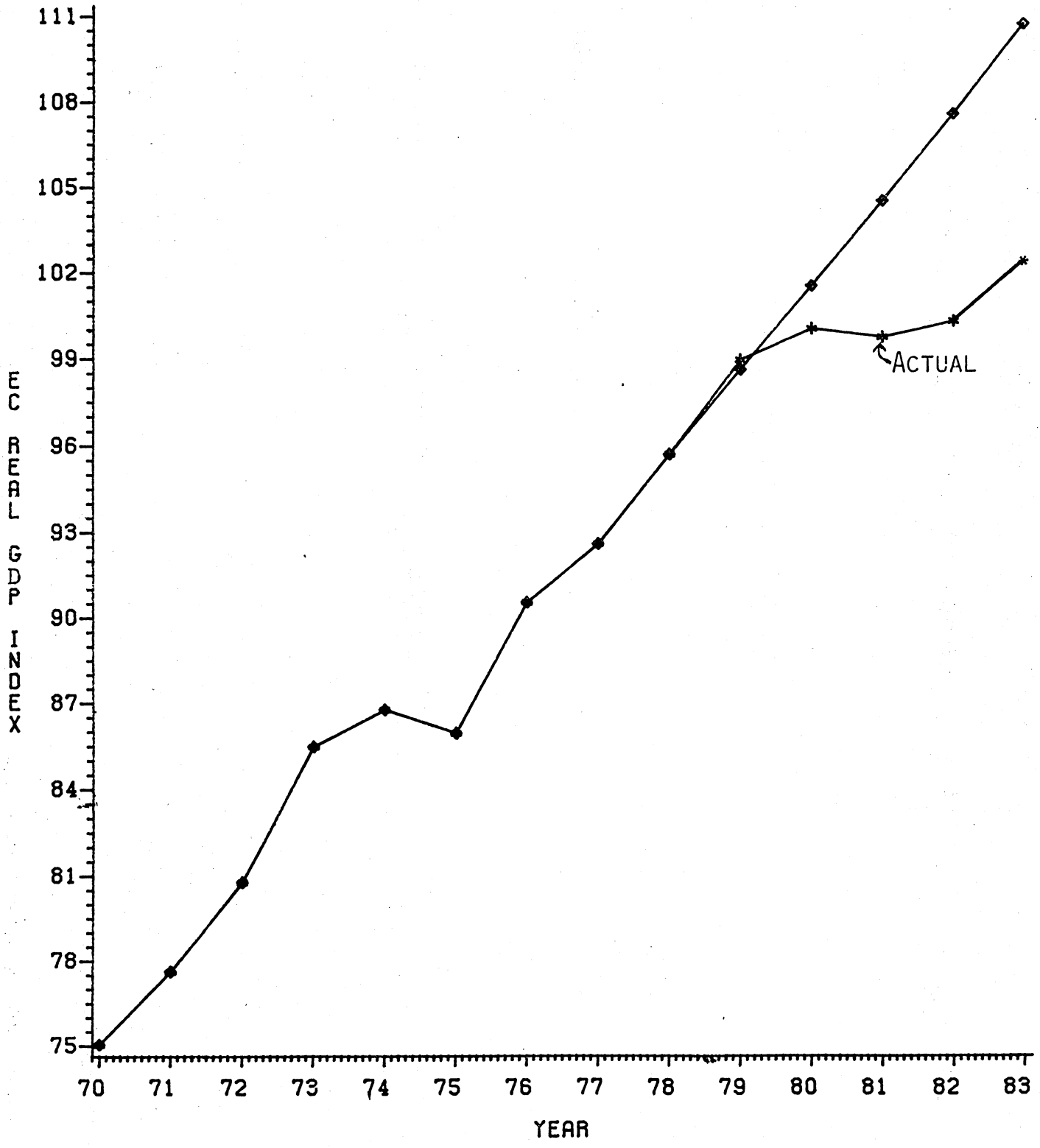


FIGURE 16

EC REAL GDP INDEX

(1980=100)



ACTUAL=STAR
IMPACT=DIAMOND

Soybeans The soybean impact analyses are based upon the regional soybean and soymeal trade model developed by Huyser (1983). Some adjustments have been made to the model to allow forecasting and analysis of these policies. The nonlinear econometric model contains ten country regions, where seven regions (U.S., Brazil, Argentina, EEC, Spain, Japan, and Eastern Europe) are endogenous and have their domestic market behavior estimated based on 1965 to 1980 data (Appendix). Two regions (USSR and PRC) are exogenous, and the rest of the world is aggregated.

As expected, a reduction in the corn threshold price lowers the import demand for soybean and soymeal by the EEC. Because of this lower import demand, the U.S. exports, prices, production and values of exports and production decline. The value of exports is about 12 percent lower under this scenario, and the production value declines by over 6 percent.

A weaker exchange value of the U.S. dollar makes the U.S. soybean products less expensive in the EEC market, leading to higher import demand. As a result, the U.S. exports, prices, production and values of exports and production increase. A more robust income growth in the World has similar effects on U.S. prices, production and the values of production and exports.

Wheat The wheat analysis is based on a regional trade model developed by Mahama (1985). The model includes 16 regions, five net exporting and 11 net importing regions (Appendix).

The results of simulation experiments are presented in Table 5. Holding the wheat threshold price at its 1978 level, reduces EEC exports by more than 51 percent. Because of this lower EEC export level, the U.S. share of wheat trade increases. The U.S. net exports increase by 3.79 mil. metric tons. As a result, the U.S. wheat price, production, and value of exports and production increase.

Table 4. Comparative annual impacts of EEC threshold prices, exchange rates and income on the soybean market (average of 1982 and 1983).

Variable	Base Level	Lower Threshold Price	Weaker Exchange Rate	Higher Income Growth
United States				
Soybean price ($/mt.)	254.27	-6.25	14.70	15.06
Soymeal price ($/mt.)	222.82	-18.53	6.90	33.04
Soybean production (1000 mt)	52064	-2149.2	3342.4	3113.8
Soybean exports (1000 mt)	22391	-1359.9	3447.1	1656.4
Soymeal exports (1000 mt)	5720	-1015.1	-553.5	1596.1
Value of exports (mil. $)	6890	-805.0	1187.0	1387.8
Value of production (mil. $)	12647	-795.9	1381.2	1304.7
European Community				
Soybean imports (1000 mt)	10907	-516.8	1756.2	641.5
Soymeal imports (1000 mt)	6602	-1666.8	-740.6	26.0

Table 5. Comparative annual impacts of EEC threshold prices, exchange rates and income on the wheat market (average of 1982 and 1983).

Variable	Base Level	Lower Threshold Price	Weaker Exchange Rate	Higher Income Growth
United States				
Farm Price ($/mt)	129.52	5.44	5.58	2.48
Production (1000 mt)	71264	2514	754	674
Net exports (1000 mt)	39762	3786	2642	943
Value of exports (mil. $)	5172	789	631	240
Value of production (mil. $)	9235	656	460	245
European Community				
Net exports (1000 mt)	10700	-5492	0	-8

Similar price effects are obtained when the U.S. exchange rates are held at their 1978 levels. As explained earlier, the EEC wheat market is not affected, since its prices are insulated. A higher growth rate of income has a smaller effect than the other two scenarios, and it is smaller than the income effects of soybeans and coarse grains. This is because of the smaller income elasticity of demand for wheat.

Coarse Grains The coarse grain impacts are based on a model originally developed by Denbaly (1984). A supply and demand model of the EEC was added to the system as well as several other supply and demand price elasticities. The countries and regions included in the expanded model are the U.S., EEC, Canada, Australia, Thailand, South Africa, USSR, Japan and an aggregate of other importers (Appendix).

The impacts of the threshold price and income growth scenarios are similar in magnitude (Table 6). Since coarse grain demand is primarily for livetock feed, the income effect in the EEC is important. The exchange rate impact is smaller because of the soymeal price effect on feed demand. Since grain prices are fixed by the CAP and soymeal is not, a depreciation of the dollar makes soymeal a more attractive feed substitute. Thus, coarse grain imports decline and partially offset the positive exchange rate effects in other regions. This result is consistent with the threshold price impact in the soybean model discussed earlier.

Table 6. Comparative annual impacts of EEC threshold prices, exchange rates and income on the coarse grain market (average of 1982 and 1983).

Variable	Base Level	Lower Threshold Price	Weaker Exchange Rate	Higher Income Growth
United States				
Coarse grain price ($/mt)	173.67	8.75	4.71	9.17
Production (1000 mt)	193100	1175	782	1073
Net exports (1000 mt)	54856	3971	2137	4139
Value of exports (mil. $)	6794	998	356	1066
Value of production (mil. $)	22808	1776	948	1643
European Community				
Net imports (1000 mt)	1820	6313	-1405	5571

Conclusions and Implications

The purpose of this study has been to assess the importance of the CAP relative to other factors affecting U.S. export markets in the 1980s. For this comparison we selected the U.S. exchange rate appreciation and the stagnant income growth abroad. These do not exhaust the other factors that have influenced export patterns in the 1980s, but they are certainly two of the major ones. The impact of holding threshold prices constant at their 1978 level is compared with holding U.S. exchange rates at the very favorable 1978 level and with a 1970s style rapid income growth scenario.

The impacts obtained from the three models are aggregated in Table 7 to provide a comparative summary across all three commodities. These are the average of the fourth and fifth year impacts of these alternatives. All three factors have important effects on the value of U.S. exports and production. The impact of the CAP, as represented by the threshold price levels, is the smallest of the three impacts. The income and exchange rate effects together have 5 times

more impact on the value of U.S. exports and 3.5 times more impact on the value of U.S. production. One reason for this result is that some of the gains from the lower EEC prices in wheat and coarse grain markets was offset by losses in the soybean sector.

Table 7. Comparison of annual changes in the U.S. value of exports and production for soybeans, wheat and coarse grains under alternative scenarios (average of 1982 and 1983).

Variable	Base Level	Lower Threshold Price	Weaker Exchange Rate	Higher Income Growth
Value of exports (mil. $)	18,855	982	2174	2694
(percent of base)		(5.2)	(11.5)	(14.3)
Value of production (mil. $)	44,690	1636	2789	3193
(percent of base)		(3.7)	(6.2)	(7.1)

The implication of these relative impacts is that, while the CAP has a negative effect on U.S. agriculture, it cannot be claimed that a reversal of the policies would bring back the boom times of the 1970s. Moreover, holding EEC prices constant, had the effect of reducing 1983 threshold prices by about 20 percent. This would mean a substantial adjustment in the CAP support levels.

The evidence in this analysis suggests that, while seeking the benefits of a more open market for grains, we should not ignore the more important macroeconomic factors that have wrenched U.S. agriculture. The strong U.S. dollar and weak income growth worldwide are among the consequences of U.S. monetary and fiscal policies in recent years. Agriculture in the United States is both export sensitive and capital intensive, so the combined effects of high real interest rates, a strong exchange rate and weak economic growth abroad are devastating.

It is useful at times to focus on other smaller but important factors such as the CAP. There clearly are potential gains to the U.S. grains sectors from lower support levels in the CAP, and the EEC has already found it in its self interest to reduce support levels and initiate some supply reductions. But if the U.S. and the EEC become too entangled in disputes over market shares, they may overlook the importance of positive efforts to expand effective demand for agricultural exports in the rest of the world (Meyers and Bredahl). A balanced approach would seek agreements toward more open markets while pressing for action on the even more important macroeconomic policies that are vital to the health of agriculture in both the United States and the European Community.

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Appendix

Summary of model specification and key elasticities used in the paper

"Effects of European and American Farm and Agricultural Trade Policies"

by

W. H. Meyers, R. Thamodaran and M. Helmar

Appendix

Description of the Trade Models

The models used in this analysis are characterized as dynamic non-spatial equilibrium models. The basic elements of a non-spatial equilibrium supply and demand model are illustrated in Figure A.1. Net imports and exports are determined in the model but not trade flows between specific regions. The summation of net demands of importers (EDT) less the net supplies of other exporters (ESO) is the net excess demand facing the U.S. market (EDN). The necessary components of this model are detailed in the equations below:

(1) $EDT = \Sigma\ DM_i - \Sigma\ SM_i = \Sigma\ f_i(P_i, Z_i) - \Sigma\ h_i(P_i, Z_i)$ $\quad i = 1,..,n$ Importers

(2) $ESO = \Sigma\ SX_j - \Sigma\ DX_j = \Sigma\ f_j(P_j, X_j) - \Sigma\ h_j(P_j, Z_j)$ $\quad j = 1,..,m$ Exporters

(3) $ESUS = h_u(P_u, X_u) - f_u(P_u, Z_u)$ United States Exports

(4) $EDT = ESUS + ESO$ Market Equilibrium

(5) $P_i = P_u e_i + M_i$ $\quad i = 1,..,n$

(6) $P_j = P_u e_j + M_j$ $\quad j = 1,..,m$

where

DM = importer demand
DX = exporter demand
e = exchange rate
M = trade margin (transport cost, tariff, or subsidy)
P = domestic price
SM = importer supply
SX = exporter supply
X = vector of demand shifters
Z = vector of supply shifters

The wheat and coarse grain models used in this study have this general form, but the demand is often disaggregated into feed and food components. The soybean sector is more complex than the grains. First, the soybean sector includes three

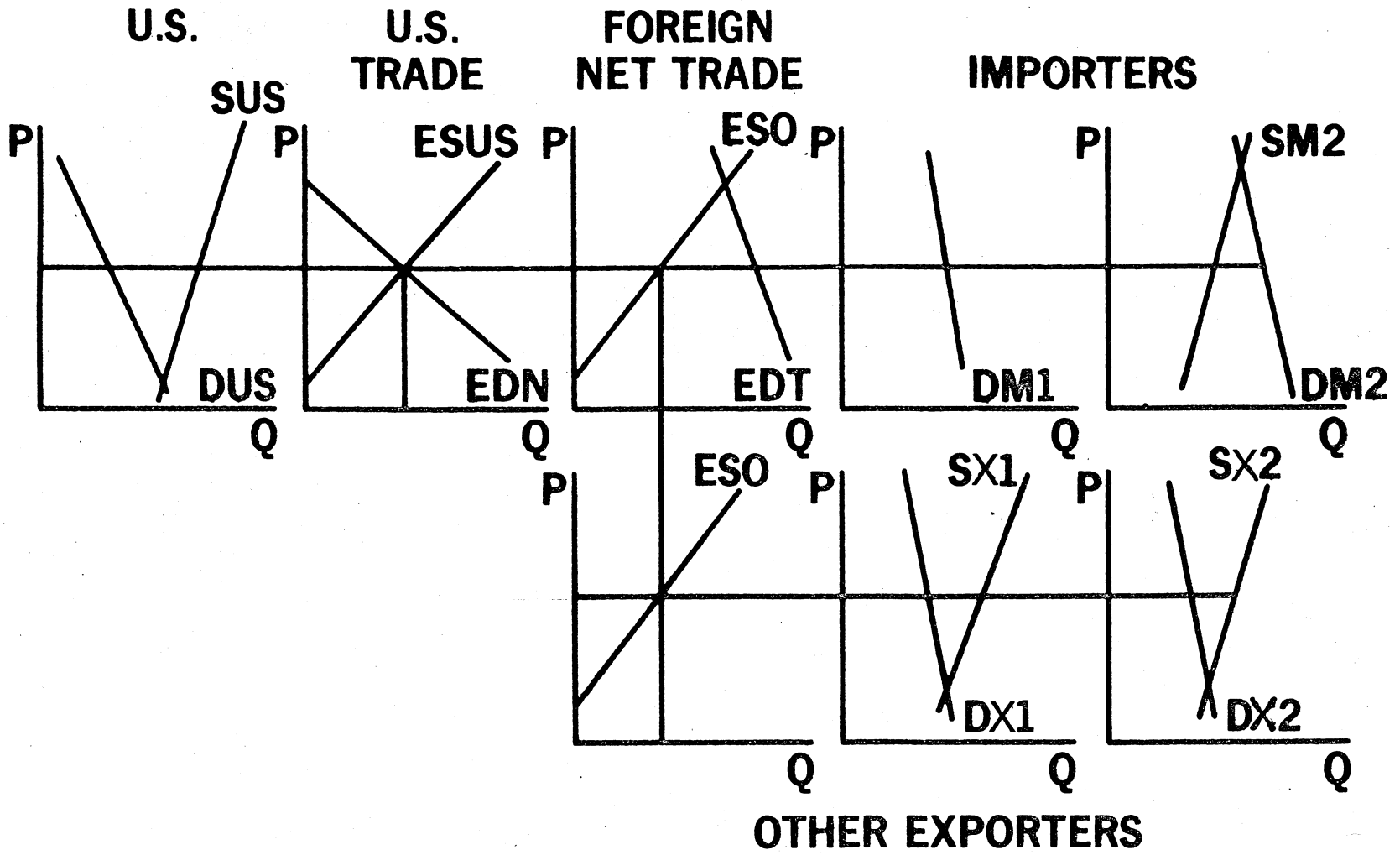

FIGURE A-1. ILLUSTRATION OF REGIONAL SUPPLY AND DEMAND MODEL

distinct but closely related markets for soybeans and its two products, soymeal and soyoil. Second, the domestic demand in the U.S. is disaggregated into crush and inventory demand for soybeans, and consumption and inventory demand for soybeans, and consumption and inventory demand for soyoil. To keep the model relatively small, oil markets were not endogenized outside the U.S. but soymeal markets were.

Soybean Model. The soybean sector model components for each country or region are shown in Table A.1 below. As explained in the body of the paper, some adjustments have been made to the original model developed by Huyser to allow forecasting and policy analysis. The model includes 3 exporting (U.S., Brazil and Argentina) and 4 importing (EC, Spain, Japan and Eastern Europe) regions. The price elasticities of the behavioral equations are summarized in Table A.1.

Wheat model. The wheat model includes 16 regions, 5 net exporting and 11 net importing regions (Mahama). The exporting regions are the U.S., Canada, Australia, Argentina, and EC. The importing regions are other West Europe, Japan, Soviet Union, People's Republic of China, Middle America, other South America, Central Africa, other South Asia, East Europe and Rest of the World.

Internal supply and demand equations are estimated for the U.S., Canada, Australia, India, and the EC. Stock equations are also specified for the U.S., Canada, and Australia. Only an area harvested equation is estimated for other west Europe, while demand equations are estimated for all other regions. Production and demand elasticities of the wheat trade model are summarized in Tables A.2 and A.3.

Coarse Grain Model. The structure of the coarse grain model differs from the other two in that it largely uses a net trade approach (Denbaly). The model has 9 regions (the U.S., EEC, Canada, U.S.S.R., Japan, Australia, Thailand, South Africa, and the rest of the world). The model includes domestic production, demand and inventory relationships for all the coarse grains for the U.S. Since this study focuses on the EEC policy, supply and demand relationships for the EEC are also endogenized in the model. Argentina and the rest of the world are exogenous. For all other regions, net trade equations are specified. Structural elasticities of supply and demand for coarse grain model are given in Table A.4.

Table A.1. Price Elasticities of Supply and Demand for Soybean Trade Model.

	Soybean Price	Soymeal Price	Soyoil Price	Value of Meal & Oil	Corn Price
U.S.					
Production	0.5				
Soybean crush	-2.06			1.83	
Soybean stocks	-0.78				
Soymeal demand		-0.43			0.15
Soyoil demand			-0.44		
Soyoil stocks			-0.19		
Brazil					
Production	0.014				
Soybean crush	-0.42			0.83	
Soymeal demand		-0.35			-0.10
Argentina					
Production	0.23				
Soybean crush	-6.83			7.53	
Soymeal demand		-0.38			
EC					
Soybean crush	-0.72			.75	
Soymeal demand		-0.14			0.86
Spain					
Soybean crush	-1.29			1.36	
Soymeal demand		-0.32			0.49
Japan					
Soybean crush	-0.27			0.17	
Soymeal demand		-0.05			0.21
Eastern Europe					
Soybean crush	-1.20			1.21	

Table A.2. Summary of Estimated Production Elasticities from the Wheat Trade Model

	Elasticity with respect to price of:			
Region	Wheat	Barley	Sorghum	Rice
U.S.A.	0.45	-	-0.41	-
Canada	0.35	-0.43	-	-
Australia	0.75	-0.48	-	-
EC-10	0.42	-	-	-
Other West Europe	0.95	-0.45	-	-
India	0.13	-	-	-0.49

Table A.3. Summary of Estimated Domestic Demand Elasticities from the Wheat Trade Model

	Elasticity with respect to price of:					
Region	Wheat	Barley	Sorghum	Rice	Corn	Income Elasticity
U.S.A.	-1.05	-	0.61	-	-	0.12
Canada	-0.24	-	-	-	-	-
Australia	0.01	0.12	-	-	-	0.19
India	-0.78	-	-	0.34	-	0.13
Other South Asia	-0.05	-	-	0.32	-	-0.88
Japan	-0.06	-	-	-	-	0.06
Central Africa	-1.13	-	-	-	0.82	2.23
Middle America	-0.40	-	-	-	0.20	0.40
Other South America	-0.20	-	-	-	0.07	-
E.C.	-0.35	-	-	-	-	-0.03
China	-	-	-	-	-	0.33
U.S.S.R.	-	-	-	-	-	0.37

Table A.4. Elasticities of Supply, Demand and Trade for Coarse Grain Trade Model.

	Price						
	Corn	Sorghum	Barley	Oats	Wheat	Soybean	Income
U.S.							
Corn supply	0.09					-0.12	
Sorghum supply		0.28			-0.28		
Barley supply			0.34	-0.34			
Oats supply			-0.29	0.29			
Feed demand	-0.36[a]		-0.36				
Non-feed demand	-0.41[a]		-0.41				
Stocks	-0.78[a]						
E.C.							
Corn supply	0.57						
Barley supply			0.15				
Corn, feed use	-0.13		-0.13				0.65
Corn, non-feed	-1.06						0.31
Barley, feed use			-0.104				0.39
Barley, non-feed			-0.87				
Canada							
Coarse grain supply			0.30[b]				
Coarse grain net export			1.31				
Australia							
Coarse grain supply			0.3[a,b]				
Coarse grain net export			1.01[a]				-1.13
Thailand							
Coarse grain supply	0.30[b]						
Coarse grain net export	0.25						-0.65
South Africa							
Coarse grain net export							-0.83
Japan							
Coarse grain net import	-0.36					0.35	1.34
USSR							
Coarse grain net import	-1.11[a]						5.86

[a]Weighted average price of coarse grains.
[b]Restricted parameter.