

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: The United States in the World Economy

Volume Author/Editor: Martin Feldstein, editor

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-24077-0

Volume URL: <http://www.nber.org/books/feld88-1>

Publication Date: 1988

Chapter Title: International Competition in Agriculture and U.S. Farm Policy

Chapter Author: Bruce L. Gardner, H. B. Atwater, Jr., John R. Block

Chapter URL: <http://www.nber.org/chapters/c6215>

Chapter pages in book: (p. 423 - 474)

7 International Competition in Agriculture and U.S. Farm Policy

1. Bruce L. Gardner

2. H. B. Atwater, Jr.

3. John R. Block

1. Bruce L. Gardner

7.1 Introduction

The United States has been the world leader in agricultural technology and the dominant factor in world grain markets. Between 1970 and 1980 the value of U.S. agricultural exports more than doubled in real terms, with the real value of grain exports more than tripling. Yet by 1986 the export and net trade positions had returned almost to the 1970 levels (table 7.1). What happened?

During the 1980s the following additional and interrelated events have caused concern about the U.S. farm economy: market prices of the grains have fallen about 30 percent (nominal) between 1980 and 1986; the average price of farmland has fallen 21 percent during the period; perhaps 150,000 commercial-scale farms, 20 percent of the total, are under severe financial stress; U.S. farm commodity programs in the 1980s were larger and more costly than ever before in real terms, even than in the 1930s and 1950s.

This paper assesses the available explanations of the decline in agricultural exports, the possible policy responses to the situation, and prospects for the near future.

Some leading hypotheses explaining weakness in the foreign market for U.S. farm products are (1) expansion of world agricultural output abroad; (2) declining (rate of increase of) demand in the developing countries; (3) macroeconomic or financial factors, notably a rise in the foreign exchange value of the dollar and weakened import demand due to events associated with the "debt crisis" in many countries; (4)

Table 7.1 U.S. Agricultural Trade (billions of dollars)

Year	Exports				Imports	Net Trade
	Grains ^a	Other Crops ^b	Livestock Products	Total ^c		
1940	1.5	1.5	.7	3.8	9.9	-6.1
1945	2.5	3.2	5.7	14.6	10.8	3.2
1950	3.3	6.3	1.2	12.1	16.7	-4.6
1955	3.3	4.8	3.7	11.8	14.7	-2.9
1960	5.5	6.5	1.9	15.5	12.3	3.2
1965	7.4	6.2	2.4	18.3	12.1	6.2
1970	6.2	6.2	2.2	18.2	14.5	3.7
1971	5.2	7.4	2.2	17.3	13.1	4.3
1972	7.1	7.7	2.4	20.2	13.9	6.2
1973	2.7	11.9	3.2	35.7	16.9	18.8
1974	18.5	13.9	3.3	40.5	18.9	21.7
1975	19.1	10.8	2.9	36.9	15.7	21.1
1976	17.0	11.1	3.8	36.4	17.4	19.0
1977	12.6	13.4	4.0	35.0	19.9	15.1
1978	15.8	15.6	4.1	40.7	20.5	20.2
1979	17.8	15.6	4.8	44.1	21.2	22.9
1980	20.6	15.9	4.4	48.1	20.4	27.9
1981	20.2	13.8	4.5	46.0	17.9	28.3
1982	14.3	12.6	3.9	36.6	15.3	21.3
1983	14.1	11.6	3.7	34.8	15.9	18.9
1984	14.4	11.4	3.9	34.9	17.8	17.1
1985	10.2	8.5	3.7	26.5	17.4	9.1
1986 ^d				22.9	18.2	4.7

Source: Council of Economic Advisers.

Note: Dollars are deflated by implicit GNP deflator; 1982 = 100.

^aWheat, rice, and feed grains.

^bCotton, tobacco, oilseed products.

^cIncludes commodities not itemized.

^dAuthor's estimate based on data through November 1986.

protectionist policies among industrial-country food importers; and (5) U.S. agricultural policies that overprice exported commodities.

Each hypothesis embodies several more specific causes of reduced demand for U.S. commodities. For example, expansion of world output occurs because of improvements in technology in developing countries, as in the Green Revolution, or because countries change their policies, as in Indonesia's promoting of self-sufficiency in rice. Also, some issues cut across several of these hypotheses, notably the issue of whether the U.S. grain export decline reflects mainly a deterioration in U.S. competitiveness as compared to other countries or a worldwide shrinkage in commodity demand compared to supplies. To present the evidence in an orderly fashion, the discussion is organized as it bears on the five hypotheses listed.

7.2 World Agricultural Output

In response to pessimistic appraisals of the prospects for food production in the developing countries (e.g., U.S. Council on Environmental Quality 1980; Brandt Commission 1980), several authors have pointed to evidence that technical progress in farming is accelerating in many countries (Avery 1984; Sanderson 1984; Johnson 1983). Impressive recent technical advances have occurred in milk production, control of livestock disease (e.g., new vaccine for foot-and-mouth disease), improved varieties of traditional crops, and development of non-traditional crops that are drought resistant or insensitive to water salinity. In addition, changes in the agricultural policies of some countries have been cited as causing increased output. India's freer pricing and regional trade and Argentina's cutting of grain export taxes are examples. The most important case, however, is China, whose agricultural output is estimated to have increased 31 percent between 1980 and 1984.¹

While these and other such episodes provide concrete evidence about emerging events, an aggregate account—the account that really matters—requires combining the well-documented instances of growth with less successful commodities and countries. While the accuracy of measured year-to-year output changes is questionable, we have no better choice than to base our overall judgment of world output trends on collections of national data, particularly as published by the Food and Agricultural Organization (FAO) of the U.N.

To see how the pre- and post-1980 data fit in with longer-term trends, figures 7.1–7.3 summarize statistics of the recent history of world agricultural production. The data are given in the appendix in table 7.A.1. Figures 7.1–7.3 are plotted on a semilogarithmic scale so that the slope indicates the rate of growth.

Figure 7.1 shows an index of worldwide aggregate agricultural production, constructed by the U.S. Department of Agriculture. The index grows at a trend rate of 2.3 percent over the 1955–85 period. This rate exceeds the world population growth rate, so we should not expect to see price rises owing to population-food pressure. Perhaps less well known, in view of the emphasis on droughts and famines in popular discussion of agriculture, is the stability of the growth of output. The index never departs from a band ± 4 percent of the trend value, and the lowest point relative to trend in recent years, in 1983, is largely attributable to the United States idling about 20 percent of its cropland under its payment-in-kind (PIK) acreage idling program.

The most significant point for U.S. exports in the 1980s is lack of evidence that the rate of growth of output in the 1980s is different from that of the preceding twenty-five years. There have been subperiods in which the growth of output accelerated, most notably between 1961

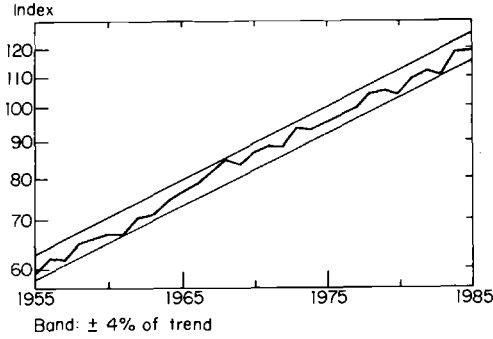


Fig. 7.1 World agricultural production.

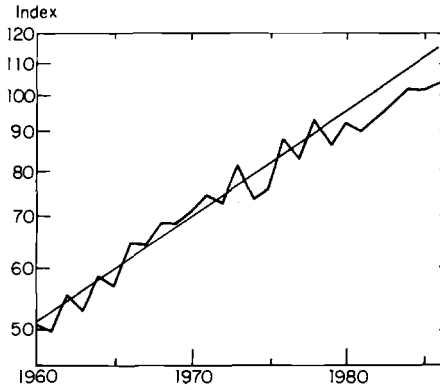


Fig. 7.2 Grain production outside the United States.

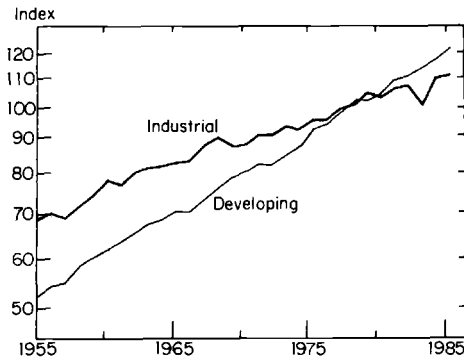


Fig. 7.3 Agricultural production in developing and industrial countries.

and 1968, and this could help explain the general agricultural price weakness of the 1960s. But nothing here explains the price weakness of the 1980s.

To focus more directly on the most discussed source of U.S. farm export problems, figure 7.2 shows the production of grains (wheat and coarse grains aggregated) outside the United States. The trend rate of growth, 3.1 percent annually in 1960–80, is higher than for all food, and grain output is less stable. A band of about 7 percent around trend is necessary to encompass all the observations, with output on several occasions rising or falling 8 percent to 10 percent within a year. The salient fact about the 1980s is that even more clearly than for all agricultural output, the production of grain outside the United States provides no explanation for the weak export market of the 1980s. Indeed, if non-U.S. production were the dominant market force, U.S. exports would be greater in the 1980s than in the 1970s. Every observation in the 1980s lies below the 1960–80 trend line drawn in these figures.

Figure 7.3 disaggregates to show developing and industrial countries separately. Aggregate agricultural output in the developing countries is growing more rapidly than in the industrial countries, at a trend rate of 2.7 percent annually in 1955–85 in the former compared to 1.6 percent in the industrial countries. The rate does not seem to have changed appreciably during this period. Although there is an apparent acceleration in the late 1960s, the Green Revolution and recent technical advances and policy changes have not shifted agricultural output in these countries either to a higher output growth rate or to a higher base level from which future growth may proceed (i.e., no apparent one-time permanent output increases shifting the trend line). The relatively slow growth of output in the industrial countries has to temper (but it does not negate) the notion that output-promoting policies of the industrial countries are a prime cause of world price weakness (as argued, for example, in World Bank 1986).

The lack of fluctuation of annual output around trend in developing countries as compared to the industrial countries—all observations of developing countries in 1955–85 being within 3 percent of the trend output—could reflect data problems. Statistics on annual changes in farm output for some countries are unreliable, and even *ex post* a year's stated output may be partly a trend extrapolation of the previous year's value. In this sense the observed stability may be a statistical artifact. Nonetheless, the maintenance of a steady trend for thirty years must surely reflect a real underlying stability in output growth.

The centrally planned economies also have a substantial 2.5 percent annual growth rate of agricultural output over the thirty-year period (not shown in figure 7.1–7.3—data in appendix). This may be surprising in view of the recurrent stories of problems in the agricultural econ-

omies of these countries. The data for China dominate the aggregate. Output in the Soviet Union grew less than 1 percent annually in 1970–85. Perhaps more striking than output trends in the centrally planned economies, given that we call them “planned,” is the variability of output around trend. While the world as a whole and the developing countries as a group are always within a 4 percent bank around trend output in 1955–85, the centrally planned economies in aggregate are more often than not outside this band. Even for this group, however, production in the 1980s is not above the thirty-year trend line.

7.2.1 Trends in Competitive Advantage

The United States is thought to be an efficient, some say the world’s most efficient, agricultural producer, but the evidence for this proposition is thin. Total factor productivity as an index of aggregate output, divided by an index of land, labor, and other inputs, can be revealing, but data appropriate for international comparisons are not available. Partial productivity measures, such as yields per acre or output per worker, are available, but must be used with care. For example, in 1982 Indonesia harvested 2.5 tons of rice per hectare while the U.S. yield was 3.9 tons. But we cannot draw conclusions about productivity without information about nonland inputs per hectare in the two countries. And even if we could obtain total cost-of-rice comparisons for the two countries, we need information about the cost of producing rice relative to other goods.

These difficulties notwithstanding, the most pertinent productivity indicators are as follows. The index of total factor productivity in U.S. agriculture published by the USDA has a trend rate of growth of 2.0 percent annually between 1950 and 1985. During the 1980s the index has been unusually volatile. It ranged from a low in 1983 of 98 (compared to a base level of 100 in 1977) to a high of 127 in 1985. The index’s average in 1981–85 was 114, compared to 101 in the previous five-year period, 1976–80, implying a 2.5 percent annual productivity growth rate. This is above the thirty-five-year trend rate of productivity growth, but the volatility of measured productivity in the 1980s is too large to infer that the increase is significant. Still, there is no evidence that U.S. agricultural productivity growth is slackening, and so no reason to suspect declining international competitiveness on this score.

Cross-country partial productivity comparisons can be made using data on grain output per hectare. For the 1960–85 period my estimate of the trend rate of growth of wheat and coarse grain yield is 2.4 percent annually in the United States. For the countries outside the United States, as an aggregate the rate of increase in grain yield is 2.6 percent for the same period. So U.S. yields are growing slightly less rapidly. But the non-U.S. countries started at a much lower yield level, and in

1986 U.S. grain yields at 4.7 tons per hectare are still more than double the 2.1 tons yield in the non-U.S. aggregate. Looking at more recent trends, the rate of growth in grain yields seems to have slowed slightly in the non-U.S. countries in the 1970s, and then accelerated in the 1980s to about a 3.0 percent annual rate of growth. The United States has remained more nearly at a steady 2.4 percent growth rate. The year-to-year volatility in yields is such that one cannot be confident that the differences between growth rates in different time periods are significant. And as the earlier caveats indicate, cross-country comparisons of yields are dubious indicators of productivity because they omit nonland inputs from the accounting. But such as they are, the grain yield data provide no cause for worry about a loss of U.S. competitiveness in agriculture.

Another approach to competitiveness is to compare the export price of competing commodities from different countries, as in the indexes of price competitiveness of Kravis and Lipsey (1971, 44). The U.S. Department of Agriculture estimates that in June 1986, when the U.S. Gulf Coast price of no. 2 hard red winter wheat averaged \$2.94 per bushel, the most nearly comparable Argentine wheat price was \$2.32, while Canadian and Australian wheat was selling from \$2.40 to \$2.70 per bushel. Moreover, since 1981 the price of Argentinian wheat declined from a 7 percent premium over the U.S. Gulf price to the 21 percent discount as of June 1986. The USDA attributes lagging U.S. wheat sales to these differences, which in their calculations persist after accounting for transportation cost and quality differences (U.S. Department of Agriculture 1986a, 2).

The significance of such price differentials is unclear; in particular, it is unclear whether they say anything about competitiveness. Neither of the two plausible views about the nature of the world wheat market permits a straightforward measure of competitiveness using the price differences. One view is that (quality-adjusted) wheat is essentially a homogeneous good. In exporting grain, international grain-trading companies such as Cargill, Continental, and others compete for sales to importers by acquiring grain interchangeably from that available at various exporting locations, according to which is cheapest at the moment. Their joint bidding and action establishes something close to competitive pricing structure in which export prices from different countries differ only because of locational or quality advantages. The price ratios then are uninformative about countries' relative production costs or competitiveness.

Still, price ratios of grain from different countries change over time in ways that cannot readily be explained by changes in marketing costs, as in the Argentina wheat case cited above, and these changes are associated with shifts in market shares (U.S. Department of Agriculture

1986c). A view that explains such observations is that wheat from different countries is a different commodity, not just quality-adjusted versions of the same commodity, so, for example, demand shifts can change what counts as “high-quality” wheat. For example, some wheats are good for spaghetti, others for bread; which kind sells at a premium to the other depends on relative supply of and demand for the two types. Since exporting countries produce different proportions of different types, they are selling different or at least differentiated products. Grennes, Johnson, and Thursby (1978) develop the argument that the world wheat market is like this. In this situation, we can speak of U.S. wheat becoming more or less competitive with imperfectly substitutable wheat from other countries and look at changing relative prices of wheat from different countries to measure competitiveness.

The most conclusive evidence that the United States is efficient or competitive in agriculture has been its dominance of the export markets. But now that dominance is slipping. U.S. farm output grew 1.9 percent annually in 1955–85 and 1.8 percent in 1970–85. Since the agricultural output of the developing countries—indeed that of the non-United States generally—grew at a faster rate while all countries faced the same world market prices, can we conclude that the United States is becoming less competitive in agriculture? No. Most countries insulate their domestic producer prices from world prices, and differential trends have occurred in the degree of protection. Some developing countries have moved from taxing their agricultures (paying producers less than world prices) to subsidizing them by paying more.

Such changes in policy could explain the decline in the U.S. share of world agricultural production that is implied by the slower U.S. output growth rate. But our knowledge of the effects of these policies is not sufficient to determine if this hypothesis explains the facts. Alternative hypotheses involve changes in factor supplies—changing trade patterns as some countries increase their ratio of farmland to labor, or farmland to other resources, by clearing jungles, constructing irrigation projects, and the like. But again our knowledge is too sketchy to draw conclusions.

A problem with any numerical indicator of efficiency or competitiveness is that the indicator may change as supply and demand conditions change. For example, the U.S. corn belt could well be the most efficient supplier of corn to the world market—the supply activity including both producing the crop and getting it shipped to importing locations—in the sense that as world prices fall low enough to squeeze out corn suppliers, the corn belt would stay in business at the lowest world prices. But at the current level of production, the U.S. marginal cost is at the higher levels that prevail in other regions. An indicator based on this cost level might show the United States as declining in

competitiveness. As this example suggests, however, the real issue is not any overall indicator of competitiveness, but rather changes in the demand for and supply of the exported commodities in the United States and elsewhere.

7.3 World Food Demand

One of the principal recurring reasons for optimism about increasing demand for U.S. agricultural commodities has been pessimism about world population growth confronting limited food production capacity. Increasing scarcity of food would in this scenario result in an increasing real price of agricultural commodities, and of land as a specific factor in agriculture, and thus real gains to food-exporting countries. In fact, real prices of agricultural commodities for which long-time series are available, such as wheat or sugar from colonial times to the present, show a persistent downward trend. For grains in the twentieth century the trend rate of price decline is about one percent annually, so real prices have declined by little more than one-half since 1900. The main reasons seem to be technical change in food production and marketing, together with a failure of demand to grow fast enough to pressure specific factors in agriculture.

Notwithstanding the long-term trend, the sharp price rises of agricultural commodities in the 1970s rekindled worries about global food scarcity. Evidence of this worry is contained not only in alarming articles, but also in speculative commodity price rises and increases in agricultural land prices. Between 1970 and 1980, U.S. crop prices received by farmers increased by 17 percent in real terms. During this same period the USDA's farm real estate price index rose 52 percent in real terms. The land price increases were large enough that they must have embodied expectations that high rental returns would persist or continue to increase for many years.²

The preceding section indicates that the failure of these expectations to be realized in 1982–86 is not attributable to a detectable surge in world food output. The natural alternative cause to look for is a decline (relative to other commodities) in world food demand. The two main possibilities for a decline from earlier expectations in demand involve the rate of population growth and the rate of consumer income growth.

Population has not grown as fast in the 1980s as forecast in some earlier projections, but it is still positive enough to add significantly to food demand each year. The U.S. Department of Agriculture publishes an index of food output per capita (fig. 7.4) that indicates world food demand pressure on available supplies. The rate of growth of agricultural output per capita over the 1955–85 period is one-half of one percent annually for the world as a whole; the same rate (to the nearest

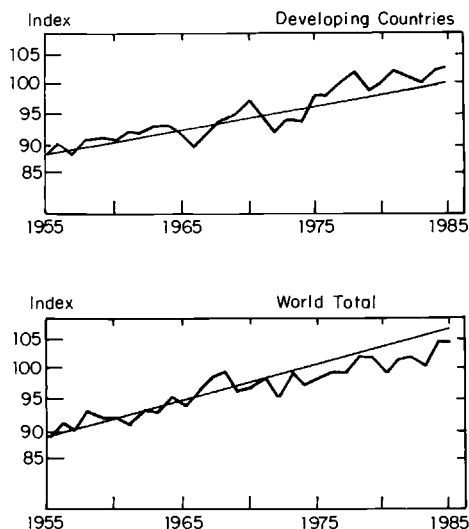


Fig. 7.4 Indexes of agricultural output per capita.

tenth of one percent) is found for the developing countries. Both time series look as if a constant-rate-of-growth trend line would fit well, but there are statistically significant departures from a constant trend. The least-squares trend lines for both the developing and whole world are drawn in figure 7.4 as estimated, using 1955–70 as the sample period. The post-1975 data depart significantly from this trend line. For the world as a whole, every observation after 1975 lies below the trend line—agricultural output is increasing faster than population, but not at as fast a rate in 1975–85 as in 1955–70. On the other hand, in the developing countries no observation after 1975 lies below the trend line. Thus, comparing figure 7.4 with figure 7.1–7.3 shows that the period of the Green Revolution and after experienced a lessening of food-population pressure in these countries because population grew slower, rather than because output grew faster.

Although the data show no trend toward an expanding *necessity* for agricultural imports prior to 1980, or a reduction in such necessity since, there is evidence that the demand for food imports rose through the 1970s and declined in the 1980s. Table 7.2 shows relevant data for some important regions. Africa, Asia, and Latin America all have been increasing their net imports of grains, at least up to 1980, in quantities that are unlikely to be caused by movements along a demand curve as real prices fell. Indeed, in 1973 and 1980, prices were high and yet imports were highest in these years. Therefore, the demand for imports must be increasing. Why? Having cast doubt on population–food supply pressure, the likely candidate is real income.

Table 7.2 Annual Net Imports of Grain (million metric tons)

Date	Africa	Asia	Latin America	East Europe and USSR	Western Europe
1948-52	0	6	-1	no data	22
1960	-2	17	0	0	25
1966	7	34	-5	4	27
1973-74	6	45	2	18	20
1980	18	64	16	43	11
1985	46	14	1	32	-16

Sources: 1948-80: *Development*, 1982:4, p. 5; 1985: U.S. Department of Agriculture 1986b.

Although the demand for food products in the industrial countries does not increase as much as income increases, perhaps 1 percent to 3 percent for each 10 percent increase in real income, the demand for food is more responsive to income in the developing countries, typically, 6 percent to 7 percent for each 10 percent income increase (see Ritson 1982, 34, for summary of estimates). Nonfood commodities as an aggregate must have an even higher income elasticity if that for food commodities is less than one, so the income growth scenario is consistent with a declining relative price of food. Still, the empirical evidence is that income growth is associated with increased food imports. The key factor in grain import demand for some rapidly growing economies is the switch from food to feed use of these commodities as the demand for meat increases. Mellor and Johnston (1984) cite the case of Taiwan, where feed use of cereals rose from 1 percent to 60 percent of total use between 1961 and 1981.

Thus, the most plausible reason for increases in cereal imports by developing countries despite rising output per capita is increasing real income in these countries. Projecting increased per capita income into the future leads to quite substantial increases in projected imports by developing countries. For example, a report by Winrock International (1983, 42) projects cereal imports of 152 million metric tons by Africa, Asia, and Latin America in 1993. A recent study by the U.S. Department of Agriculture's Economic Research Service projects an increase of 40 million metric tons in grain imports by the developing countries during the 1980s (White, Mathia, and Overton 1986, 143). However, the 1985 data of table 7.2 are not on the paths to these outcomes. Except in Africa, imports have decreased substantially in the 1980s.

What happened? Since real income growth is credited with causing agricultural imports to rise until 1980, perhaps real income per capita has stopped growing in the developing countries. The World Bank estimates that real GDP per capita in the developing countries as a

group increased at an annual rate of 3.2 percent in 1973–80 and 1.3 percent in 1980–85 (World Bank 1986, 45). This decline seems small, but it could have had a significant effect because the market for traded grains is thin. The developing countries produce about four-fifths of the grains and over 95 percent of the rice they consume. If the rate of growth of demand fell by 1 percent, while the rate of growth of output continued to rise at almost 3 percent per year, it is not hard to accumulate a 20 percent to 30 percent reduction in excess demand over five years. Suppose the decline in the rate of GNP growth of 1.9 percent (from 3.2 to 1.3) caused a decline in the rate of food demand growth of 1 percent (income elasticity of .5), from 2.5 percent to 1.5 percent per year. With output growing at 2.7 percent per year, excess demand decreases by 1.2 percent of consumption each year. This 1.2 percent is about 5 percent of quantities imported. If this occurs every year between 1981 and 1986, we accumulate a 25 percent reduction in aggregate food import demand.

The slow-income-growth explanation does not, at first glance, fit well with less aggregated data for the developing countries. Low-income countries in Asia had faster-growing real GNP in 1980–85 than in 1973–80, yet their agricultural imports declined most, as seen in table 7.2. Low-income countries in Africa had a 2 percent annual decline in per capita real GNP in 1980–85, yet their cereal imports increased. These apparent anomalies are explained by concurrent changes in other determinants of demand growth. In Asia, because of technical change, increased price incentives for producers, and decreasing rates of population growth, increases in supply outpaced the growth of demand; some Asian countries achieved self-sufficiency in cereals, particularly rice. In Africa, the income decline was accompanied by, and indeed was in part caused by, slumping growth in agricultural output. And the population growth rate remained high. Between 1974–76 and 1982–84, food production per capita declined by more than 10 percent in Somalia, Ghana, Kenya, Mozambique, Zambia, Lesotho, Zimbabwe, South Africa, Cameroon, and Botswana (World Bank 1986, 190). The potential for increased import demand was realized without the income growth normally required, in part because of increased food aid shipments, which count as imports.

Several recent papers have argued that an important cause of developing-country import increases in the 1970s was cheap (negative real interest rate) credit plentifully supplied by the industrial countries. Then the “debt crisis” of the 1980s turned this situation on its head and caused import demand to weaken (see White, Mathia, and Overton 1986, 128; Insel 1986; Watkins and Galston 1986). A helpful review of arguments and evidence on this hypothesis is provided in Dutton, Grennes, and Johnson (1986).

There seems to be no clear a priori reason for debt to be strongly associated with food imports. Nonetheless, there is an empirical linkage between decline in growth of debt and declining agricultural imports in the 1980s. Dutton, Grennes, and Johnson estimate that for a set of debtor countries that bought U.S. farm products in 1972–84, each \$1 billion in annual net financial inflow induced \$400 million in agricultural imports.

7.4 Macroeconomic and International Financial Policies

Monetary and fiscal policies in both the United States and abroad have been linked to the export performance of U.S. agriculture. To the extent that these policies influence real income growth or debt, they affect the demand for imports as discussed in the preceding section. The macroeconomic effects that have received most attention, however, are the consequences of changes in exchange rates. A recent assessment by the World Bank (1986, chap. 4) finds exchange rate overvaluation to be one of the principal sources of a bias against agriculture that is widespread among developing countries. The bias works against agriculture mainly because many of the overvaluing countries are traditional agricultural exporters; by overpricing their currencies they overprice their commodities from the viewpoint of foreign buyers. While movements in real exchange rates track agricultural exports quite well—the World Bank summarizes studies of Nigeria, Ghana, Argentina, and Brazil—the direction of the changes has been mixed. The African countries have been losing export markets and the Latin American countries gaining.

With respect to U.S. exchange rates, three events concerning the value of the dollar have received much emphasis: the fall in the dollar in the early 1970s, the rise in 1980–85, and the decline since the first quarter of 1985.

The importance of the depreciation of the dollar for encouraging U.S. agricultural exports during the period when the flexible exchange rate regime was introduced has been emphasized by Schuh (1975). Subsequent empirical work, notably by Chambers and Just (1981), confirmed the importance of exchange rate movements. They estimated that in 1969–77, each 1 percent decline in the value of the dollar, measured as the exchange rate of dollars for SDRs, caused exports of wheat, corn, and soybeans to rise 0.7 percent to 4.1 percent (depending on the commodity and whether a short-run or long-run adjustment). Orden (1984) attempts to distinguish the effects of exchange rates on U.S. corn exports from effects of standard supply and demand variables such as yields and foreign income, using 1970–80 data. He finds that exchange rate movements explain more of the observed variations in

export quantities in the early 1970s, during the shift in exchange rate regimes, but less in the late 1970s as compared to the standard supply-demand variables.

Assessment of the relative importance of these causal factors requires an econometric model incorporating them. Three approaches to such modeling are (1) estimation of particular structural relationships between putative causal variables and trade flows, for example, Chambers and Just's (1981) examination of the effect of the exchange rate on grain exports; (2) reduced form equations in which trade flows are explained by a list of variables assumed to be exogenous, without attempting to model the structural mechanisms that relate subsets of endogenous or exogenous variables to one another, for example, Dutton, Grennes, and Johnson (1986); (3) multivariate time series analyses of trade and related variables, attempting to deduce by leads and lags which variables cause which, for example, Chambers (1981), and Orden (1984).

The third approach can be viewed as a preliminary exploration that should be undertaken before trying either of the other two. Chambers (1981) found that the money supply influenced agricultural trade, but that a null hypothesis that interest rates influenced trade could not be rejected. Batten and Belongia (1986) found that while the real exchange rate influenced agricultural exports, they could not find any influence of monetary policy on the real exchange rate in the 1980s (through 1984:3), the particular period we are most interested in. No investigators have reported significant effects of agricultural sector variables on macroeconomic variables such as interest rates or GNP growth in recent years, although such effects were found in 1970s. While large price shocks emanating from commodity markets or policies can undoubtedly influence the overall economy—and even more so the measurement of GNP-account effects, as discussed by Tatom (1986)—persistent effects do not show up in time series data. Consequently there is some warrant for proceeding, as most investigators have proceeded, by taking macroeconomic variables as exogenous to agriculture and estimating reduced-form or structural relationships in approach (2) or (1).

The particular relationships of interest involve effects of exchange rates, foreign income and debt, non-U.S. production, and other countries' policies on the demand for U.S. agricultural commodities. The empirical work indicates great difficulty pinning down the effects. Results are sensitive to ways variables are measured (which exchange rate, which money supply), specification of estimating equation (variables excluded and econometric technique), and data period covered. The last is particularly important in limiting the usefulness of earlier studies because evidence shows that the 1980s are not like the 1970s

(Orden 1984). This situation is disappointing but not surprising, given the large range of estimated parameters for even the much-investigated domestic commodity supply and demand elasticities, not to mention the elasticity of demand for U.S. farm exports (see Gardiner and Dixit 1986).

Although econometric studies of exchange rates and agricultural exports concentrating on data of the 1980s are lacking, the results of work on earlier periods reinforce the presumption that the rise of the dollar in 1980–84 must have been an important factor in the weakening market for U.S. exports (see Schuh 1985). Relevant data for the grain markets are shown in table 7.3. Between 1980 and 1984 the real trade-weighted dollar index of the Federal Reserve Board rose by 41 percent (from 84.8 to 128.5), while grain export quantities fell by 15 percent from 111 million to 95 million tons. However, the big drop in exports did not occur until 1985, when the real trade-weighted dollar rose only 3 percent.

Short-term relationships are difficult to isolate in the annual data because of lags between price changes as perceived by importers and the induced shipments of U.S. grain. Also, the annual data show the exchange rate on a calendar-year basis but exports on a marketing-year basis, for example, 1985–86 wheat exports as shipments of the crop harvested in 1985, and shipped between June 1, 1985, and May

Table 7.3 U.S. Grain Exports and the Value of the Dollar

Marketing Year	Exports (million metric tons)	Trade-Weighted Dollar, Real (FRB)
1970–71	38.5	
1971–72	40.5	
1972–73	69.1	
1973–74	73.8	98.8
1974–75	63.6	99.2
1975–76	82.0	93.9
1976–77	76.5	97.3
1977–78	86.9	93.1
1978–79	92.7	84.2
1979–80	108.8	83.2
1980–81	110.7	84.8
1981–82	108.0	100.8
1982–83	116.4	111.7
1983–84	95.5	117.3
1984–85	95.4	128.5
1985–86	61.0	132.0
1986–87 ^a	74.6	

Sources: U.S. Department of Agriculture; Council of Economic Advisers.

^aForecast by U.S. Department of Agriculture, December 1986.

31, 1986. Thus, the value of 132.0 for the value of the dollar corresponding to exports in 1985–86 is the calendar-year 1985 value. This seems roughly appropriate since even though much grain harvested in 1985 is shipped in 1986, the contracting for these shipments is done largely in 1985. Still, because the extent and length of time in advance that is typical of forward sales vary, and because on average there appear to be one- or two-quarter lags between price changes and exports, it is possible that the export decline in 1985–86 reflects in part earlier rises in the value of the dollar.

Dunmore and Longmire (1984) attempt a synthesis of existing evidence to explain the relative importance of the following factors as causes of declining U.S. exports of grains and oilseeds in 1980–83: the change in production of these commodities outside the United States, the change in population and real per capita income abroad, the exchange rate between the importing countries' currencies and the dollar, purchase decisions by the Soviet Union, the EC's policy-determined exports, changes in freight rates, and the debt situation in importing countries. Dunmore and Longmire find foreign production and exchange rate movements to be the most important short-term contributors to the weakening export market in 1980–82. From the earlier discussion, the picture looks somewhat different for the longer-term comparison of the mid-1970s with the mid-1980s. Foreign production is less important, real income growth more important.

Haley and Krissoff (1986) estimate the effect of the value of the dollar on U.S. wheat exports during 1973–85. They improve on the work cited earlier by using multicountry real exchange rate indexes weighted by each country's share of the world wheat market. Their inflation-adjusted index of the dollar's value compared to currencies of wheat importers rose 46 percent between 1979 and 1985, and their index for competing wheat exports rose 43 percent.³ This is somewhat less than the increase of 59 percent in the real FRB index of table 7.3, but all the indexes track fairly closely in the 1980s. They estimate that a 1 percent permanent increase in the exchange rate reduces wheat export quantity by 2.5 percent over a period of eleven quarters, with essentially no effect until the fifth quarter after an exchange rate change.

Given the evidence for 1980–84, it is disappointing that there appears to have been no appreciable response of quantities exported to the decline in the value of the nominal FRB trade-weighted dollar index from a peak of 156 in the first quarter of 1985 to 124 in the second quarter of 1986, a fall of 23 percent. This could be a matter of lagged effects, but even a six-quarter lag should be showing more results than so far observed in the grains. The lack of effect is more surprising in that a principal difference between U.S. grain markets of the 1980s and the 1970s is the determination of domestic nominal commodity prices

by stock accumulation at support prices in the 1980s. There should be more pronounced export quantity response to exchange rates under 1980s conditions. A shift in foreign demand for U.S. commodities has a bigger quantity effect and a smaller price effect when the supply of marketed quantities out of stocks is very elastic at the support level.

The best explanation for the apparent lack of effect of the dollar's fall to date is that while the trade-weighted dollar has fallen, the dollar has not fallen against our principal market-oriented export competitors—Canada, Australia, and Argentina (Dutton and Grennes 1985)—or against developing country importers; the countries in Europe and Japan against which the dollar has fallen have effective quantity limits on imports and insulate their domestic producer and consumer prices. So all the falling dollar does is to increase the border protection necessary to maintain the internal price and the size of export subsidies required to meet U.S. competition for EC exports in third-country markets. The demand for imports is essentially unresponsive to lower prices offered on world markets. To consider carefully the policy options for dealing with this situation requires prior discussion of farm policies, both abroad and in the United States.

7.5 Agricultural Policies Abroad

The U.S. position in agricultural trade has undoubtedly been harmed by the agricultural policies of importers and competing exporters. Not all countries have increased their protection of agriculture in the 1980s, however; in these instances they cannot be blamed for the problems of recent years. Japan has achieved self-sufficiency in rice by paying producers and charging consumers three to five times the world price, and has set severe limitations on imports of other agricultural products. This policy has been unchanged in the 1980s, but maintaining internal prices has caused border protection to increase as world prices fell.

The more damaging change among industrialized-country importers has been that of the European community. The EC has converted itself from a net importer of 10 million (metric) tons of grain in 1975 to an exporter of 16 million tons in 1985. The internal price has been kept at about the same level relative to the world level over time, via variable levies on imports, but production at the supported price has increased so much that a substantial surplus over EC consumption occurs. This is disposed of on world markets via export subsidies. Thus, the mid-1980s world prices of grains are lower than they would be without EC agricultural protection. The policy-induced net export volume of about 20 million tons amounts to about 1.5 percent of annual world wheat and feed grain production (10–15 percent of world grain trade), which could itself drive down the world price by 10 percent to 20 percent,

given the inelastic aggregate world non-EC demand and supply functions typically estimated for grains.

Developing-country importers and exporters of grains have also changed their policies in the 1970s and 1980s in such a way as to encourage production and thus reduce the market for U.S. grain. In some cases, notably for rice in China, Indonesia, and Thailand, policies that formerly held farm prices down were replaced by policies that increased farm prices, in some cases providing effective net protection by subsidizing inputs, particularly fertilizer. This probably explains part of the reduction in Asian grain imports between 1980 and 1985. Nonetheless, as discussed with reference to figure 7.1–7.3, there has been no evident acceleration in agricultural output growth in the developing countries as a whole. Therefore, unlike the case of the EC, there is no good reason to blame developing-country farm or trade policies for the decline in the market for U.S. grains in the 1980s as compared to the 1970s.

Among competing exporters, Brazil in soybeans and Argentina in grains made substantial inroads in world markets in the 1970s. The industrial-country grain exporters, Canada and Australia, have maintained fairly low levels of intervention in the form of maintaining slightly higher domestic prices than export prices, but have not made significant changes in the 1980s.

The overall picture consists of two parts: the effects of policies on world agricultural commodity trade; and the effects of policies that reduce the U.S. share of the export market. On the first aspect, Tyers and Anderson (1986) provide simulations of the consequences for all OECD countries, all developing countries, and both groups together when they abandon their border distortions in seven commodity markets: wheat, rice, feed grains, beef, pork and chicken, dairy products, and sugar. Tyers and Anderson use supply and demand equations for each commodity, including cross-price effects, for thirty countries and regions. They assume removal of policy-created differences between world prices and internal prices for each country or region as of 1980–82. Some of their results are given in table 7.4. Liberalization by industrial countries, developing countries, or both groups jointly increases trade substantially for all commodities and raises the world price for all but rice and poultry. Exporting countries like the United States would be gainers, although the price effects as simulated are small for grains and sugar. There is a net gain worldwide of \$40 billion annually.

With respect to recent changes in the U.S. share of world commodity trade, table 7.5 summarizes recent data. The U.S. share has fallen off since 1975, mostly because of shifts to the EC. The gains of traditional exporters, Canada and Australia, for example, have been smaller. This

Table 7.4 Simulated Effects of Liberalization of Commodity Markets (percentage changes)

	OECD Liberalization	Developing Country Liberalization	Liberalization in All Market Economies
World Prices			
Wheat	2	7	9
Coarse grain	1	3	4
Rice	5	-12	-8
Beef	16	0	16
Pork and poultry	2	-4	-2
Dairy products	27	36	67
Sugar	5	3	8
Trade Volume			
Wheat	-1	7	6
Coarse grain	19	12	30
Rice	32	75	97
Beef	195	68	235
Pork and poultry	18	260	295
Dairy products	95	330	196
Sugar	2	60	60

Source: Tyers and Anderson 1986.

Table 7.5 Shares of World Grain Exports (percentage)

Year ^a	United States	EC - 10	Other Exporters ^b
1960	57	-42 ^c	45
1965	58	-26	43
1970	50	-28	51
1975	66	-9	35
1980	64	2	34
1981	61	4	35
1982	58	6	38
1983	56	6	40
1984	52	10	39
1985	49	10	41

Source: U.S. Department of Agriculture, Foreign Agriculture Service.

^aYear refers to crop year, e.g., 1960 is the period of time, July 1960 through June 1961, when the 1960 crops were sold.

^bCanada, Australia, Argentina, South Africa, and Thailand.

^cMinus sign indicates share of world imports.

suggests a greater weight for export subsidies and a lesser weight for the value of the dollar in explaining the decline in the U.S. export share in the 1980s.

7.6 U.S. Agricultural Policies

Wide agreement exists that U.S. farm commodity programs are important in determining the U.S. position in world trade, but there is much disagreement about what particular policies have done. There is even more disagreement about what policies are appropriate in 1987. Because of the range of policies for different commodities, the complexity of some of them, and disagreements about their effects, it is difficult to provide a discussion that is complete and comprehensive in a small space. This section concentrates on some of the main events and programs for key commodities.

7.6.1 Price Supports

In trade discussions, European countries argue that U.S. farm policies are equivalent to export subsidies in that these policies pay U.S. producers more than the world price and increase supplies on world markets. The opposite concern was important in U.S. farm policy discussions in 1985—that U.S. farm programs were supporting the world market price and hindering U.S. exports. An extraordinary document (U.S. Department of Agriculture 1985), authored jointly by four former secretaries of agriculture of both political parties, Freeman (Kennedy administration), Hardin (Nixon), Butz (Nixon-Ford), and Bergland (Carter), stated that cuts in market price support levels were essential to help the United States regain its former competitiveness in world markets. An assessment of which view is correct is not as straightforward as might be expected because U.S. policies have some elements that encourage exports but at the same time have other features that discourage exports.

Corn Price Support Program

Consider the price support program for corn. It has three main elements: (1) a “loan rate,” or market support price, (2) a “target” price, and (3) an acreage reduction program. These are explained in turn, with examples drawn from the program for corn up to 1985.

Loan rate. The loan rate is not an interest rate but the price at which the Commodity Credit Corporation (CCC) values corn as collateral for nonrecourse loans under provisions established by law. *Nonrecourse* means that the CCC must accept corn valued at the loan rate as payment in full, including interest. The corn loan rate for the 1985 crop was \$2.55 per bushel; thus a farmer could place 1,000 bushels under loan

(meaning having the corn in commercial storage or approved on-farm bins) and receive a loan of \$2,550. If the market price rises above the loan rate plus interest charges, the farmer repays the loan and reclaims the corn. If not, the farmer turns over the corn to the CCC. Since this program guarantees the loan rate (less storage costs), it places a floor under the market price at roughly the loan-rate level. Whatever excess supply exists at the loan rate ends up in CCC stocks.

The implication for international trade is that no one is going to sell corn for export at less than the market support level. When the United States sets its loan rate at above the U.S. border price that would prevail in the absence of intervention, corn goes under loan instead of being exported. The only reason exports are not choked off completely is that as U.S. corn is withdrawn from the world market, world prices rise. The United States is not a small country in the sense of being able to sell any quantity at the prevailing world price. Between 1972 and 1980 the market price of corn was generally above the loan rate. But in 1981, market prices fell and CCC stocks began to accumulate rapidly. By the time the 1982 crops were harvested, it was clear that CCC stocks of corn were going to approach the levels that had characterized the 1960s. This situation led to the Payment-in-Kind (PIK) Program of 1983, which reduced harvested area by about one-fourth of 1982 acreage, drove up prices in the world market, and placed U.S. prices well above the loan levels. Higher prices permitted carryover stocks to be reduced from 3.5 billion to 1.0 billion bushels. However, support prices were not reduced, and with no PIK in 1984, stocks began building up again. By the fall of 1985, CCC corn stocks were projected at 4.0 billion bushels, larger than ever. This realization led to the view that loan rates should be cut in the new farm legislation being debated in 1985.

Complications in the loan program are that Congress establishes a national loan level or range within which the secretary of agriculture can establish it, but variations from state to state occur, presumably reflecting the price surface justified by regional differences in normal prices. Also, loan rates are defined for particular grades of the commodity, with discounts or disqualification for lower quality. Moreover, to receive the CCC loan, grain must be in approved on-farm storage facilities or in commercial storage which the farmer must pay for. Therefore, particularly in the immediate postharvest period, the U.S. average farm price can fall well below the loan rate. For example, in November 1985 the average price received by farmers was estimated by the USDA to be \$2.20 per bushel, even though the loan rate was \$2.55 and there was no lack of corn eligible for the loan program. Thus the price floor is somewhat spongy. The average price for the 1985–86 crop year (September 1–August 31) was \$2.35, 20 cents below the loan rate.

Target price. The target price is a support level for producer receipts but not for the market price. Producers receive deficiency payments equal to the difference between the target price and higher of the loan rate or the average farm price for the first five months of the marketing year. In 1984 and 1985 the corn target price was \$3.03 per bushel, 48 cents above the \$2.55 loan rate. Farmers cannot realize \$3.03 on all they wish to produce. The net benefits to farmers are reduced by the requirement that acreage be idled in order to qualify for payments.

Acreage reduction. In 1985, program participants had to idle 10 percent of their corn base acreage, a percentage established by the U.S. Department of Agriculture. To obtain a notion of the cost to farmers, suppose land yields 140 bushels per acre and has an annual rental value of \$100 per acre, or \$.71 per bushel. For each bushel that would normally have been produced, the participating farmer receives the deficiency payment of \$.48 on 0.9 bushel, but has to give up the rental value of \$.71 on idled land that could have produced 0.1 bushel. Therefore, the net gain is $($.48 \times .9) - ($.71 \times .10) = $.36$ per bushel. The alternative action, not participating, provides the farmer \$2.55, assuming the market price is supported at that level. The effective price guarantee for a participating farmer is thus $\$2.55 + .36 = \2.91 .

Complications change the program benefits further. There are complications that make things better for producers: (1) a farmer may have low-quality land to idle, with rent foregone of less than \$100 per acre; (2) in a special provision for 1985, hay could be harvested from certain nominally idled land; (3) a portion of deficiency payments is paid in advance, at planting time, so the farmer gets about six-months interest on part of the \$.48; (4) although the regulations proscribe this, if the farmer only idles 9 percent rather than 10 percent of the corn base, the government will probably not discover the fact, and it is probably also safe to grow potatoes or melons, or run cattle on some idled land for a short time, even though these activities are not permitted. There are also complications that make things worse for producers: (1) the regulations require that land be idled, but weeds must be controlled and conservation practices followed; (2) the farmer may have fixed resources, equipment, and perhaps the farmer's own labor which will be idled along with the land; (3) when the market price on a U.S. average annual farm-level basis falls 20 cents below the loan level, the guaranteed price is correspondingly 20 cents below the target price.

The acreage reduction program's complications mean that a 10 percent set-aside does not simply reduce output by 10 percent from the no-program output. Although participation generates a net gain in the example given above, and does so also for plausible parameter values using U.S.- or state-average yield and rental values, there are evidently

farmers for whom participation does not pay since only 69 percent of corn production was enrolled in the 1985 program. This means actual output is reduced by less than 10 percent. Moreover, since we expect lower-quality land to be idled, and perhaps even some cheating, output will be reduced by less than the 6.9 (10×69) percent of the acreage base enrolled. Finally, since the payment increases the net incentive to produce corn, we expect farmers to try to produce more corn on their reduced acreage by using more fertilizer, pesticides, or other measures. So output falls by an even smaller percentage than quality-adjusted, truly idled land does. These complications all work in the same direction and taken together constitute "slippage." Slippage has proven difficult to measure beyond the nonparticipation aspect, but the aggregate evidence indicates that in recent years, for both corn and wheat, it has been about 30 percent for a given output price (Norton 1985). That is, the 10 percent corn ARP of 1985, which reduced base acreage by 6.9 percent, probably reduced output by ($6.9 \times .7$) about 5 percent from what would have been produced on the base acreage.

What is the effect of all three program elements together? The target price protection causes farmers to produce more than they would with no price supports, and their excess production drives down world and U.S. prices, providing justification for the European complaints. But the acreage reductions work in the other direction, tending to hold world prices up. Which effect dominates? The acreage reductions have already been estimated to have reduced corn output by 5 percent from what otherwise would have been produced given the price incentive that existed. But how much extra production potential was caused by target-price protection?

To estimate the output effect, two facts are needed: the producer price under the 1985 guarantee compared to the market price that would have existed in the absence of the program, and the response of production to higher prices, that is, the elasticity of supply of corn.

To estimate the market price in the absence of the program, we need a judgment about how low prices would have to go to make annual U.S. corn production equal domestic consumption plus exports. In the 1985 crop year, 6.5 billion bushels of corn were marketed, giving an indicator of demand. On the supply side, to estimate no-program output at trend yields (to abstract from random yield fluctuations) we add 5 percent additional acreage to reflect the absence of acreage controls, giving output of 9.1 billion bushels. Thus the excess supply is 2.6 billion bushels. The 6.5 billion bushels were marketed at an average farm level price of \$2.35 per bushel. The 9.1 billion bushels correspond to output at a producer price of \$2.91, from earlier calculations. How much would prices have to fall to achieve a common producer and consumer price that would clear the market? To answer this question requires an es-

timate of elasticity of demand as well as supply. Neither elasticity is known with precision, but a demand elasticity in the range $-.35$ to $-.70$ and a supply elasticity of $.15$ to $.40$ seem defensible (see Gardner 1986 or Lin 1986 for further discussion). The most price-responsive elasticities, $.4$ and $-.7$, imply that price would have to fall to \$1.87 per bushel to clear the market. The least price-responsive elasticities imply that price would have to fall to \$1.28.⁴ The corresponding quantities at which production equals use are 8.0 billion bushels and 7.6 billion bushels. The largest no-program quantity would occur with the more elastic demand and less elastic supply combination, in which case no-program output would be 8.4 billion bushels.

For the whole range of assumptions, the quantity of corn produced in the absence of the corn program is less than the 8.6 billion bushels, given the 1985 program. Therefore, the Europeans seem to be correct in asserting that U.S. policy increases supplies and is expected to be world-price depressing. However, the CCC loan program must still be considered. The 6.5 billion bushels that go onto the markets at the \$2.35 supported price are less than the lowest simulated output with no program. Therefore, because of the CCC loan program the European view cannot be sustained—the three elements of U.S. price support policy taken together result in world prices higher than they would be if the U.S. abandoned its programs.

The preceding simulations pertain to the corn program of 1985. The story would be essentially the same for all the crops marketed under the Agriculture and Food Act of 1981, that is, the 1982–85 crops. The biggest departure from the calculations would have occurred in 1983. Then the acreage reductions were larger, and U.S. policy was world-price supporting even without the CCC loan program.

The situation is different in detail but qualitatively the same for the other exported feed grains—barley and sorghum—as well as for wheat, rice, and cotton. In each case the U.S. loan program tended throughout 1982–85 to support the world price by diverting commodities that would otherwise have been exported or consumed domestically into CCC stocks. So there is no case for the programs through 1985 being world-price depressing. It is more nearly correct to argue, as many did, that U.S. price supports were providing an umbrella under which other exporters could expand output at prices higher than would prevail in the absence of U.S. programs. Thus the commodity programs of the 1980s must have caused a decline in the share of world grain trade accounted for by U.S. exports. In cotton, the United States was essentially priced out of the market in 1985, as exports declined from 6 million to 2 million bales between the 1984–85 and 1985–86 marketing years.

The Food Security Act of 1985

The 1985 Food Security Act, in effect since January 1986, is in some respects a response to the situation of export depression and stock accumulation. The act reduces the loan rates and, moreover, introduces provisions that completely divorce the loan rate from market prices for rice and cotton, and provide options for doing so in wheat and corn. The corn loan rate, for example, fell from \$2.55 in 1985 to \$1.92 per bushel for the 1986 crop (28 percent); the Gramm-Rudman budget reduction legislation resulted in a further 4.3 percent cut. For changes in other commodities, see table 7.6. In the fall of 1986 and early 1987, the cash price of corn at Chicago was in the \$1.50–1.60 range, about \$1.00 lower than a year earlier. In real terms these prices are about one-fifth the corn prices of 1974–75 and are about half the levels of 1969–71, before the commodity boom began. In cotton the percentage declines in market price were about the same, and in rice even larger, with 1986 prices about one-half the 1985 level.

While the 1986 programs cut market support levels, this was much less a move toward market orientation than one might at first suppose. The target prices were left unchanged. Acreage controls were tightened. And export subsidy activities were intensified.

Table 7.6 U.S. Support Prices in 1985 and 1986

Commodity	Type of Support	1985	1986 ^a
Wheat	target	\$ 4.38/bu	\$ 4.38
	loan	3.30	2.40
Corn	target	3.03	3.03
	loan	2.55	1.92
Soybean	loan	5.02	4.77
Cotton	target	81.0¢/lb	81.0
	loan	57.3	ineffective
Rice	target	\$11.90/cwt	11.90
	loan	8.00	3.60 minimum
Milk	support	11.60 (after July 1)	11.20 ^b
Sugar	support (attained via quotas)	18.0¢/lb	18.0

^aGramm-Rudman-Hollings budget reduction act results in 4.3 percent cut in effective target prices and loan rates.

^bCCC support remains at \$11.60, but a 40 cent per hundredweight producer assessment was introduced in April 1986.

Freezing the target prices while loan rates were cut meant big increases in deficiency payments. The payment in corn goes from \$.48 in 1985 to \$1.11 per bushel in 1986. Moreover, farmers' participation jumped from 69 percent to 83 percent of the acreage base. After Gramm-Rudman adjustment we still end up with about \$6 billion to be paid on corn. In the case of rice, the target price is at \$11.90 per hundredweight, and the 1986 program let the market price fall from \$8.00 to about \$4.00. Thus, government payments to rice producers will be about twice the market value of the rice crop.

Keeping target prices up while cutting market prices makes the commodity programs more like production subsidies, so the Europeans' complaints seem more appropriate in 1986 than 1985. And one can sympathize with the other rice exporters, notably Thailand, who, with a halving of the U.S. export price along with the depreciating dollar, face a much tougher marketplace. However, a complicating factor is that acreage controls were tightened in 1986. Plantings of corn in 1986 were down 8 percent from 1985, with wheat down 5 percent, rice 4 percent, and cotton 10 percent. However, these cuts are probably not large enough to reduce production to no-program levels.

Moreover, further steps were taken in 1986 that, coupled with loan rate cuts, place U.S. policy indubitably in the world-price-depressing category. These steps involve the disposal of CCC stocks accumulated from past (1982-85) surpluses and the export subsidies that accompany this action. Carryover stocks of corn and rice are currently about one-half of a year's production, and carryover stocks of wheat three-fourths of annual output. Cutting loan rates can prevent further accumulation, but existing stocks have to be pared down to economically appropriate levels. Since current production is not randomly large, nor is export demand high because of transitorily low production abroad, carryover stock levels that can be justified for stabilization purposes are probably quite low—no more than 10 percent of normal production. Therefore it makes sense in terms of financial management by the government to dispose of some of existing stocks, even at a loss. The U.S. government has been disposing of stocks by using them in food aid, in payments in kind to producers to compensate program participants for some acreage diversion, and to exporters as an in-kind subsidy.

The Export Enhancement Program (EEP) is intended to be targeted specifically at markets into which the EC has sent subsidized commodities. Under this program, exporting companies can bid for sales to markets designated by the secretary of agriculture, undercutting competitors' prices by amounts negotiated between the importer and the company. If the negotiated price is approved by the U.S. Department of Agriculture, the company receives sufficient CCC grain to compensate the company for the difference between the negotiated

sale price and the prevailing U.S. domestic price taken as the company's cost of grain exported. An example is shown in table 7.7 for wheat sales to Morocco. The availability of subsidies for 1.5 million tons of wheat sales to Morocco was announced in September 1985. In December 1985 and December 1986, deals were consummated as shown in table 7.7. Given the negotiated sale price and terms, the Department of Agriculture payment ("bonus") varies according to judgments about the loss the exporting company would incur if not compensated. The bonus is then paid in bushels of wheat from CCC stocks, valued at the U.S. price deemed appropriate. The subsidy varies from sale to sale, averaging \$22.56, or 20 percent of the average f.o.b. price.

Overall, between June 1985 and December 1986, sales under the EEP amounted to 7.3 million tons of wheat and flour, 1.5 million tons of barley, 17,750 head of dairy cattle, and small amounts of rice, semolina, and frozen poultry. The aggregate value of the commodities is \$921 million, with CCC book value (an overstatement of the market value) of bonuses equal to \$534 million.

The effects of the EEP are difficult to estimate. Because the quantities subsidized are limited, and less than the total imports of the buying countries, it is doubtful that the program has added to consumption in these countries. Instead, the main consequence is an income transfer from U.S. taxpayers to whoever gets the right to buy at the subsidized U.S. price and sell in favored importing-country markets. Since the subsidy does not add to consumption, to a first approximation, it does not change world prices even if it causes shuffling of export and import customers. But the release of CCC stocks to pay the subsidies, stocks that would otherwise be held off the market, must place some down-

Table 7.7 Export Enhancement Program, Wheat Sales to Morocco

Date of Sale	Type of Wheat ^a	Quantity (tons)	Sale Price (\$/ton)	Terms of Sale ^b	Bonus (\$/ton)
12-20-85	SRW	180,000	131.00	c&f	20.55
12-30-85	HRW	120,000	131.50	c&f	20.60
1-17-86	HRW	200,000	113.50	fob	22.81
1-17-86	HRW	60,000	113.50	fob	22.81
1-21-86	HRW	120,000	106.00	fob	25.38
1-21-86	SRW	80,000	106.50	fob	24.95

Source: U.S. Department of Agriculture.

^aSRW is a soft red winter wheat; HRW is hard red winter wheat. (SRW has less than 12 percent protein and is used in unleavened bakery products such as crackers; HRW has 8-15 percent protein and is used in bread making.)

^bC&f means priced at Moroccan port; fob means priced at U.S. port. The roughly \$18 per ton difference is transportation cost.

ward pressure on world market prices. These quantities are not recycled into CCC stocks via new loans because the loan rates for the 1986 crops have been cut while the release prices for previously acquired CCC stocks have not.

Prospects for 1987

The constellation of 1986 programs—cutting loan rates, unloading stocks, and subsidizing exports—will continue in 1987 and has real promise of causing exports to rebound. The effects to date are most apparent in cotton, where exports from the 1986 crop are projected by USDA at triple the very depressed exports from the 1985 crop. USDA projects 1986 crop exports, as compared to 1985, to be up 30 percent for rice and 25 percent for wheat and corn (U.S. Department of Agriculture 1986a). These estimates are quite uncertain, in that export projections have had considerable error in recent years. The grain export markets have remained weak and suggest that USDA may have been too optimistic. The sluggishness of exports, given that loan rate cuts and the dollar's decline have reduced the price of U.S. grain as seen by industrial-country importers by about half in the past two years, has led to criticism of the 1985 act and calls for changes in farm legislation. Congress is expected to consider several reforms in 1987.

The main recent change in farm policy discussion bearing on international trade is renewed interest in production controls. The 1985 act required that a nonbinding poll of wheat producers be conducted on their preference for a production control program. To the question; "Do you favor imposition of mandatory limits on the production of wheat that will result in wheat prices that are not lower than 125 percent of the cost of production (excluding land and residual returns to management)?"', 54 percent of 319,000 valid ballots said yes. Nonetheless it appears unlikely that such mandatory controls will be imposed. The 1987 programs already announced use 1985-act authorities of the secretary of agriculture to idle an additional 15 percent of corn acreage and maintain acreage reduction at 1986 levels for wheat, rice, and cotton. Hopes for farm price increases from production cutbacks that persisted for more than a year or two seem doomed because the demand for U.S. commodities abroad is too price-responsive.

Attempts to move further toward market pricing by additional cuts in CCC price supports for corn or wheat have the great drawback of increasing budgetary costs, which are already seen as too high. With full participation by farmers, each 13 cent cut in the CCC loan rate adds \$1 billion to government outlays through deficiency payments.

Intensification of export subsidy efforts is another possibility that runs afoul of budgetary costs. The dubious cost-effectiveness of the

targeted subsidies of 1985 and 1986 in expanding export quantities has also tarnished this approach (see U.S. Department of Agriculture 1986b).

The Reagan administration has proposed cutting target prices 10 percent in 1988 from the 2 percent reductions scheduled in the 1985 act. This would reduce budgetary costs and begin the phaseout of supporting U.S. producer prices 50 percent to 100 percent above world market prices, a phaseout that economic efficiency will sooner or later require. But this step will be difficult for Congress.

7.6.2 Policies Other Than Price Support Programs

Although the commodity programs are the most important current determinant of U.S. exports, other policies have also played a role. The export embargoes of 1973–80 continue to be controversial, as do food aid programs. More important than either for the future, however, may be multilateral agreement on agricultural policy and trade issues resulting from GATT negotiations.

The Legacy of Embargoes

The U.S. embargoed exports of soybeans in 1973, and in 1974, 1975, and 1980 suspended grain sales to the Soviet Union. Congress in 1985 enacted legislation requiring the Department of Agriculture to conduct a study to determine the losses to U.S. farmers caused by past export embargoes. Since the last such embargo occurred five years previously, in a year during which U.S. grain export quantities nonetheless reached their all-time high, this legislation shows the remarkable political strength of what would appear to be an economically minor event. The resulting study, listing as principal contributors more than twenty economists from universities across the country in addition to USDA staff, concluded that the embargoes were not a significant cause of the economic problems of U.S. agriculture in the 1980s (U.S. Department of Agriculture 1986b). Nonetheless, farm commodity groups expressed amazement and the secretary of agriculture disavowed the study.

Could the study have been so badly mistaken? The notion that there must have been significant effects has been well expressed by a spokesman for the American Soybean Association: “four embargoes in eight years set up a trend. . . . We know our reputation as a reliable supplier has been injured” (*Washington Post*, November 28, 1986). The best observable indicator of this phenomenon is that the U.S. share of Soviet grain imports dropped throughout the 1980s, until in the 1986–87 marketing year the Soviets have bought no U.S. grain. This plausibly reflects a Soviet desire to reduce its dependence on the United States, encouraged by the embargoes. However, it is far less clear that the decline in the U.S. share of worldwide aggregate grain imports has

been caused by aversion to buying from the United States as opposed to other sources. Such aversion should show up as unwillingness to pay as much for U.S. grain as for that from other sources; but as indicated earlier, U.S. prices in the mid-1980s have if anything tended to be premium rather than discounted compared to grain from other sources. Thus, the most accessible but inconclusive evidence suggests no significant lasting impact of the embargoes. More detailed investigations intended to sort out embargo effects from other events have reached the same finding.

Export Subsidies via Surplus Disposal

Going back to the P.L. 480 program initiated in the mid-1950s, the idea of disposing of surplus commodities by shipping them abroad at below-market prices has been a key element in farm commodity support efforts, especially for rice and wheat.

Some information on concessional sales is presented in table 7.8. P.L. 480 exports have remained quite constant over thirty years in dollar terms, meaning they have declined in real terms. Despite recent increased interest in these programs, they still account for a much smaller percentage of U.S. exports than they did in 1956–70.

As is the case for the targeted export subsidies of 1985 and 1986, the effectiveness of these programs is questionable. The USDA (1986b, I-20) estimates that the subsidies necessary to cause an additional ton of U.S. wheat exports would be larger than the cost of simply destroying the wheat. Surplus disposal also has been criticized for reducing production incentives in other countries, which would tend to increase

Table 7.8 Government-Assisted Agricultural Exports (billions of dollars)

Fiscal Year	P.L. 480	CCC Subsidized Sales	Subsidized Credit	Total	Percent of All Agricultural Exports
1956–60 (ave.)	1.4	1.0	0.1	2.5	61
1961–65	1.5	1.2	0.1	2.8	51
1966–70	1.2	1.4	0.3	2.9	45
1971–75	1.1	1.9	0.5	3.5	23
1976–80	1.4	0.0	1.3	2.7	9
1981	1.5	0.0	1.9	3.4	8
1982	1.2	0.0	1.5	2.7	7
1983	1.3	0.1	4.2	5.6	16
1984	1.5	0.0	3.9	5.4	14
1985	1.7	0.0 ^a	2.9	4.6	15

Source: U.S. Department of Agriculture.

^aExcludes EEP sales, which were negligible until FY 1986.

demand for imports in these countries. But we do not have good evidence on these effects.

In addition to their direct effects, these programs and the Export Enhancement Program discussed earlier have strategic aims. They are intended to increase the cost of other countries' agricultural support prices. The particular aim is to increase the cost of the EEC's export subsidies. The EEC pays the difference between its internal price and the world market price on the grain it exports. If U.S. policy cuts the world price by \$30 per ton—and the wholesale price of U.S. corn has fallen by more than this in the past year—the cost to the EEC is about \$500 million based on their 1985 exports of 16 million tons. The EEP is intended strategically to force the EEC on a country-by-country basis to either match the U.S. sale price or abandon the market. Matching the EEP subsidies to date has not been nearly as problematical as the threat posed by the lower loan rates on grains. The biggest strategic success to date may well have been the EEC's response to seeing the U.S. price of rice fall from \$8.00 to \$4.00 per ton in the spring of 1986; the contemplation of what would result from similar policies in wheat and feed grains is likely behind the increased willingness of EEC countries to place agriculture on the GATT agenda, as discussed below.

At the same time, the strategic risk exists of escalating retaliation. The lower feed grain prices resulting from 1986 programs pushed the Canadians to a finding that deficiency payments constituted an implicit export subsidy and a consequent retaliatory Canadian duty on imports of U.S. corn. The effects of this duty are quantitatively negligible, but illustrative of the risks in strategic action in trade policy. Another side of the EEP subsidies is that the USSR, in reneging on its long-term agreement to buy U.S. wheat and corn, gave as a reason for not buying in 1986–87 that the USSR could not get the subsidized prices while other countries could.

Of course, strategic action typically involves differences between stated and really intended plans, and between stated reasons and real reasons for what is actually done. The Canadian corn tariff issue must be considered jointly with U.S. hog producers complaints against imports of Canadian pork and the U.S. International Trade Commission's 1986 finding (reversing an earlier decision) that Canadian timber sales policy amounted to an export subsidy on lumber. The possible additional motives for the USSR's decision are too tangled even to attempt to list.

The highest-profile agricultural trade dispute in early 1987—the threatened U.S. tariffs on certain European wine, cheese, and related products—does seem independent of the 1986 U.S. policy initiatives, however. The issue here is proper U.S. compensation under GATT rules for the U.S. loss of feed grain markets in Spain and Portugal as

they come under the EEC's agricultural protection umbrella. This brings us to the general topic of agriculture and the GATT.

Trade Negotiations in Agriculture

The demand for U.S. commodities has been reduced by other countries' protection of agriculture. Much of the protection is consistent with the outcome of trade negotiations under the General Agreement on Tariffs and Trade, and ironically it was at the insistence of the United States that agricultural exemptions to free trade principles were introduced. The United States to the present day relies on tight import quotas to maintain its sugar and dairy price supports, in the former case achieving U.S. prices three to five times higher than world prices. In January 1987 the New York offshore price of raw sugar was 6.5 cents per pound while the New York domestic price was 21 cents. In the 1950s the United States was concerned more generally with defending its grain and cotton price supports from imports at the support levels and so achieved a GATT waiver for import restrictions necessary to maintain domestic farm programs.

Now that other countries make more use of import restrictions in maintaining domestic producer price protection, the picture is different from the U.S. viewpoint. The United States sought and achieved inclusion of agriculture in the agenda for the upcoming round of GATT negotiations. Equally important, at the Tokyo Summit in May 1986 the leaders of the United States, Japan, France, Germany, and the United Kingdom agreed that liberalization of agricultural trade was desirable and that current trade problems were inseparable from the domestic farm policies of the countries involved.

With respect to the developing countries, there is a risk that they may emulate the industrial countries and subsidize farmers in pursuit of food self-sufficiency. Dorosh and Pearson (1985) provide an interesting case study of Indonesia, and the World Bank's *World Development Report* (1986) outlines others. It is evident that such policies can make comparative advantage irrelevant. If Saudi Arabia can become a surplus grain producer, and it has, any country can. The argument for trade is that self-sufficiency can be quite costly. Saudi Arabia pays producers about \$25.00 per bushel for wheat, while the U.S. target price at \$4.38 is too high (in the sense that U.S. producers would be willing to produce more than they do now at a lower price).

The policy implication is that both the United States and other countries could make themselves significantly better off by joint agreement to reduce their protection of agricultural commodities. The deadweight losses are not the small triangles that one finds for excise taxes because instead of 5 percent or 10 percent price distortions we have ones that are 100 percent or 200 percent for some commodities, notably sugar

and dairy products. Tyers and Anderson (1986) estimate the net worldwide gains from liberalization of their seven agricultural commodities to be \$40 billion. I have estimated that unilateral liberalization of the U.S. farm programs would cost U.S. farmers about \$10 billion per year and benefit consumers and taxpayers by \$15 billion (Gardner 1986). Most of the \$5 billion deadweight loss is the opportunity cost of idled land and losses on stored commodities (not the usual triangles). If other countries liberalized jointly with the United States, the costs to U.S. farmers would be less because world prices would be raised.

While this could make U.S. liberalization more palatable politically, it is not in the cards at present despite the attention given to this year's \$25 billion budgetary cost of farm programs. Candidates of both major parties campaigned in 1986 with promises to do more for farmers; no candidate in any state promised to work to cut back farm supports; Congress, in its pre-election positioning, acted to increase, not to reduce, farm program costs; and in the election itself the Democrats, who had promised farmers most, gained in both houses. In this climate the preliminary agreement to place agriculture on the agenda in the upcoming GATT negotiations is the only bright spot on either the domestic or international agricultural policy scene. Belated discussions between the United States and Canada and the United States and the EC have succeeded only in the limited sense of having prevented recent increases in agricultural protection from accelerating as rapidly as they have threatened to do.

7.7 Conclusion

Several hypotheses concerning the decline of U.S. agricultural exports in the 1980s have been discussed, along with some evidence bearing on them. The hypotheses that seem most important are (1) the slowdown in population and real income growth among importers and accompanying debt problems, (2) EC agricultural policies, (3) the rise in real foreign exchange value of the dollar, and (4) the U.S. CCC loan program. Recent events point to an improved export situation as far as (3) and (4) are concerned, but for (1) and (2) the prospects are less clear. Hypotheses that do not appear to be as important are expansion of agricultural output in developing countries and the legacy of past embargoes. However, there are reasons to believe that agricultural protection and the rate of growth of developing-country output might accelerate (see Avery 1984 and references cited therein). And there is a real risk that more of these countries may choose to pursue food self-sufficiency.

The outlook for world agricultural commodity markets and for the U.S. position in them is highly uncertain. Most consistent with events

observed to date, using world trading prices as a measure of market conditions, is that these prices will continue a random walk with downward drift in real terms of about one percent annually, punctuated by periodic "commodity booms." Characteristic of the three booms observed in this century, roughly corresponding to World War I, World War II, and 1973–76, is the lack of a convincing explanation of why prices rose as much as they did in any of them. In all three episodes, none of the supply and demand shift variables discussed in this paper contributes as much as dummy variables for the years in question to the explanation of why prices rose above trend in those years. The economic picture for producers is a period averaging about twenty five years of subsistence returns, irregularly interrupted by a few years of extraordinary profits. The position of U.S. agriculture in the future depends on trends in productivity and demand variables in the U.S. compared to the rest of the world, and on policies in the various countries. It is difficult to be at all confident about any projection for either the economic or political events. The volume of agricultural trade will probably resume an increasing trend, as continuing economic development fosters specialization on a worldwide basis; but the U.S. share of world agricultural production and trade could as well increase or decrease. It does seem unlikely that the U.S. share will decrease enough that its agricultural export volume will fall over time.

The problem is that even if U.S. export volume increases, but at a low rate, this will require a continuing shrinkage of not only the agricultural labor force—which is almost certain in any event—but also of capital and land in agriculture. Suppose that total factor productivity in U.S. agriculture continues to increase at about 2 percent annually, and domestic demand at 1 percent of U.S. production. This means that 1 percent of annual production must be added to agricultural exports each year to keep the current level of resources employed in agriculture. With one-fourth of output exported, this means that U.S. export volume must grow at 4 percent annually to fill the gap (and exports must continue to increase as a fraction of farm production). This rate of increase in real export value has been achieved by the United States over the past thirty years. Although there are many plausible scenarios under which the rate of U.S. export expansion could be faster or slower in the next thirty years, the theory and evidence discussed in this paper are insufficient to provide a forecast.

The implications of this uncertain situation for U.S. agricultural policy are that flexibility is required and that policies that would isolate the United States from the world market are a nonstarter for either U.S. farmers or the overall national interest. Whatever the objectives of U.S. agricultural policy, the appropriate steps in pursuit of them will change as currently unpredictable events unfold. And for any policy

that seeks to maintain a healthy farm sector over the long term, isolation is untenable because productivity trends imply that farm exports cannot simply be maintained but must grow unless the sector as a whole is to decline; yet if steps are taken to reduce U.S. productivity growth, such as a cutback in biotechnical research, the United States will lose the export markets it still retains to countries in which agricultural productivity continues to grow.

Appendix

Table 7.A.1 Indexes of Agricultural Production, 1955–85 (1976–78 = 100)

Year	United States	All Industrial Countries	Centrally Planned Countries	Developing Countries	World Total
1955	65	69	54	53	59
1956	66	70	59	55	62
1957	65	69	60	56	62
1958	69	72	63	59	65
1959	70	74	62	61	66
1960	72	78	60	62	67
1961	73	77	60	64	67
1962	73	80	61	66	70
1963	76	82	62	68	71
1964	76	82	70	69	74
1965	78	83	71	71	76
1966	77	84	78	71	78
1967	81	89	80	74	81
1968	83	91	82	77	84
1969	84	89	80	80	83
1970	62	89	85	82	86
1971	89	92	87	84	88
1972	90	92	86	84	88
1973	92	95	97	86	93
1974	87	94	95	89	93
1975	94	97	93	94	95
1976	96	96	98	96	97
1977	102	100	97	100	99
1978	102	103	104	104	104
1979	109	107	104	104	105
1980	102	105	102	107	104
1981	113	108	103	112	108
1982	113	110	110	113	111
1983	92	102	115	116	110
1984	109	112	120	120	117
1985	115	113	119	125	119

Source: U.S. Department of Agriculture 1986a.

Notes

1. Percentage changes in this paper are calculated as changes in natural logarithms. The source of production data used in this section is primarily from the U.S. Department of Agriculture 1986a, 1986b, and 1986c.

2. The land price rises were consistent with the expectations that land rental rates of the mid-1970s would continue forever, but these expectations are not possible to distinguish, in these data, from high rents existing for ten to fifteen years and then falling back. For evidence on U.S. land prices and land rents, see Alston 1986 and Burt 1986, which follow up on Melichar 1979 and Feldstein 1980.

3. Construction of these indexes is tricky because of the existence of several exchanges rates, some in parallel markets, in some of the importing countries, and because of high inflation rates that may not be measured accurately. For example, the value of the dollar against the countries that import U.S. wheat, weighted by each country's share of U.S. sales, rose from an index value of 85 in 1982 to 105 in 1985. But the nominal value of the dollar, before adjusting for inflation rates, rose from 488 in 1982 to 11,841 in 1985 (U.S. Department of Agriculture 1986a).

4. The calculations are as follows. To fit the with-program price-quantity points, the constant elasticity supply curve at the elasticity extremes must be $Q_s = 7.75 P_s^{.15}$ or $Q_s = 5.94 P_s^{.40}$, where Q_s is quantity produced and P_s is the producer price. The demand curves must be $Q_d = 8.77 P_d = 8.77 P_d^{-.35}$ or $Q_d = 11.8 P_d^{-.70}$. Finding equilibrium by equating $Q^s = Q^d$ and $P^s = P^d$, the implied prices and quantities are as stated for the elasticity extremes.

References

- Alston, Julian M. 1986. An analysis of the growth of U.S. land prices. *American Journal of Agricultural Economics* 68:1-9.
- Avery, Dennis. 1984. World food productivity: Rising fast. Bureau of Intelligence and Research, U.S. Department of State. Report 969-AR.
- Batten, D. S., and M. T. Belongia. 1986. Monetary policy, real exchange rates, and U.S. agricultural exports. *American Journal of Agricultural Economics* 68:422-27.
- Brandt Commission. 1980. *North-South: The report of the Independent Commission on International Development Issues*. London: Pan Books.
- Burt, Oscar R. 1986. Econometric modeling of the capitalization formula for farmland prices. *American Journal of Agricultural Economics* 63:934-41.
- Chambers, Robert G. 1981. Interrelationships between monetary instruments and agricultural commodity trade. *American Journal of Agricultural Economics* 63:934-41.
- Chambers, Robert G., and R. E. Just. 1981. Effects of exchange rate changes on U.S. agriculture. *American Journal of Agricultural Economics* 63:32-46.
- Dorosh, Paul A., and S. R. Pearson. 1985. Macroeconomic policy and agricultural development in Indonesia. Food Research Institute, Stanford University Mimeo.

- Dutton, John, and Thomas Grennes. 1985. Measurement of effective exchange rates appropriate for agricultural trade. North Carolina State University. Economic Research Report, no. 51.
- Dutton, John, Thomas Grennes, and P. R. Johnson. 1986. International capital flows and agricultural exports. *American Journal of Agricultural Economics* 68 (forthcoming).
- Dunmore, John, and James Longmire. 1984. Sources of recent changes in U.S. agricultural exports. Economic Research Service, USDA. ERS Staff Report no. AGES 831219.
- Feldstein, Martin. 1980. Inflation, portfolio choice, and the prices of land and corporate stock. *American Journal of Agricultural Economics* 62:910–16.
- Gardiner, W. H., and P. V. Dixit. 1986. Price elasticity of export demand. USDA. ERS Staff Report no. AGES 860 408.
- Gardner, Bruce. 1986. Economic consequences of U.S. agricultural policies. World Development Report background paper. World Bank, Washington, D.C.
- Grennes, T. J., P. R. Johnson, and M. Thursby. 1978. *The economics of world grain trade*. New York: Praeger.
- Haley, S. L., and B. Krissoff. 1981. The value of the dollar and competitiveness of U.S. wheat exports. U.S. Department of Agriculture. ERS Staff Report no. AGES 860611.
- Insel, Barbara. 1986. Comment. In R. Paarlberg, ed., *U.S. agricultural exports and third world development*. Curry Foundation, Washington, D.C.
- Johnson, D. Gale. 1983. The world food situation. In D. G. Johnson and G. E. Schuh, eds., *The role of markets in the world food economy*. Boulder, Colo.: Westview Press.
- Kravis, Irving B., and Robert E. Lipsey. 1971. *Price competitiveness in world trade*. Studies in International Relations, no. 6. National Bureau of Economic Research, New York.
- Lamm, R. 1980. The role of agriculture in the macroeconomy. *Applied Economics* 12:19–35.
- Lin, William. 1986. Effects of farm commodity programs: The cases of corn and rice. Paper presented at the American Agricultural Economic Association meetings, Reno, Nevada.
- Longmire, Jim, and Art Morey. 1982. Exchange rates, U.S. agricultural export prices, and U.S. farm program stocks. USDA, International Economics Division.
- Melichar, E. 1979. Capital gains versus current income in the farming sector. *American Journal of Agricultural Economics* 61:1058–92.
- Mellor, J. W., and B. F. Johnston. 1984. The world food equation. *Journal of Economic Literature* 22:531–74.
- Norton, Nancy. 1985. *The effect of acreage reduction programs on the production of corn, wheat, and cotton*. M.S. thesis, University of Maryland.
- Orden, David. 1984. The exchange rate and international corn market. Virginia Polytechnic and State University. Mimeo.
- Ritson, Christopher. 1982. *Agricultural economics*. Boulder, Colo.: Westview Press.
- Sanderson, Fred H. 1984. World food prospects to the year 2000. *Food Policy*.
- Schuh, G. Edward. 1975. The exchange rate and U.S. agriculture. *American Journal of Agricultural Economics*.
- . 1985. International agricultural and trade policies. In B. Gardner, ed., *U.S. agricultural policy*, 56–78. American Enterprise Institute, Washington, D.C.

- Tatom, J. A. 1986. How federal farm spending distorts measures of economic activity. Federal Reserve Bank of St. Louis. *Review* 68:16-22.
- Thompson, Robert L. 1981. A survey of recent developments in international agricultural trade models. USDA-ERS, Washington, D.C.
- Tyers, Rod, and Kym Anderson. 1986. Distortions in world food markets: A quantitative analysis. World Bank. Mimeo.
- U.S. Council on Environmental Quality. 1980. *The global 2000 report*. Washington, D.C.: GPO.
- U.S. Department of Agriculture. 1985. Joint statement on agricultural policy by former secretaries of agriculture, Freeman, Hardin, Butz, and Bergland. Press release.
- . 1986a. *Agricultural outlook*. August and October issues.
- . 1986b. Embargoes, surplus disposal, and U.S. agriculture. Economic Research Service. Staff Report no. AGES 860910.
- . 1986c. World indices of agricultural and food production. Economic Research Service. Statistical Bulletin no. 744.
- Watkins, A. J., and W. A. Galston. 1986. International debt, domestic credit, and the rural economy. Mimeo.
- White, T. K., G. Mathia, and E. Overton. 1986. Global trends in agricultural production and trade. In *U.S. agricultural exports and third world development*. Curry Foundation, Washington, D.C.
- Winrock International. 1983. *World agriculture: Review and prospects for the 1990s*. Morrilton, Ark.
- World Bank. 1986. *World development report 1986*. New York: Oxford University Press.
-

2. H. B. Atwater, Jr.

From the Club of Rome to Agricultural Surplus: The Dramatic Reversal in World Agricultural Trade

The dramatic reversal in world agricultural trade in the last ten years has confounded the predictions of grain traders and economic pundits alike. In the 1970s, world agricultural markets were booming. There was even a high level of hysteria that widespread starvation was inevitable because production could never keep up with growing demand. By 1987 there had been a complete reversal of these trends, with heavy worldwide stocks of grain and a slackening in world demand for agricultural imports. In particular, the position of the United States as the dominant supplier has deteriorated rapidly and dramatically.

I explore the factors responsible for the export boom of the 1970s and the export bust of the 1980s. With that background, and bearing in mind the hazards of forecasting, I then talk very gingerly about the

future direction of world agricultural trade and our political choices in the United States.

The thesis I develop is that world agricultural markets have changed dramatically and will not return to their previous condition. The United States has gone from being the world's largest net exporter of agricultural commodities to the point where we were a net importer for two months last year. I do not expect the United States will regain the position we enjoyed in world agricultural trade during the 1970s. Furthermore, we can no longer expect a large U.S. agricultural trade surplus to offset trade deficits in manufacturing and services.

All the evidence in the 1970s would have sharply contradicted this thesis. International agricultural trade was growing rapidly, and most experts predicted continuing growth. For example, total world wheat imports grew by 71 percent from 1970 to 1980. Some other grains and commodities more than doubled their world imports from 1970 to 1980.

The lesser developed countries of Asia, Africa, and Latin America were major players in this import growth. Four factors stimulated LDC imports: first, rapid population growth; second, a deemphasis of agricultural development relative to urban industrial development; third, a belief that their mineral, oil, and industrial exports would be able to pay for a greater dependence on agricultural imports; and fourth, readily available debt in international financial markets, which they used, in part, to pay for agricultural imports.

In addition to the LDC pressures for imports, the farm economy of Eastern Europe and Asia was in disarray, as poor weather, particularly in the Soviet Union, exacerbated the problems of command economies with few incentives for agriculture.

Frightening projections of future supply and demand for food became the conventional wisdom. The Club of Rome issued a siren call noting the rapidly increasing growth in world population and predicting drastic shortages of all raw materials and commodities, including food, by 1985. In 1974 the environmental fund issued a declaration on population and food, stating, "we have reached, or nearly reached, the limit of the world's ability to feed even our present numbers adequately." To offset the terrible consequences of this anticipated world food shortage, books such as Frances Moore Lappé's *Diet for a Small Planet* urged us to eat grains and other complex carbohydrates rather than meats and heavily processed foods. Since it takes roughly seven pounds of grain to produce one pound of beef, a switch from beef to grain consumption in the richer countries of the world would free up food supplies which could be shifted to the starving and malnourished in the lesser developed countries.

These concerns were not the mere doomsday prophecies of well-meaning Cassandras: the prices of agricultural commodities and of the

factors of production in agriculture were increasing substantially. Food prices were escalating dramatically in the United States, and, as a food marketer, I can well remember the consumer boycotts of supermarkets in cities across the United States during the mid-1970s. Grain prices were skyrocketing, and the price of farmland was escalating. Companies in the grain-trading business dramatically expanded their investment in barges, ships, and grain terminal facilities, as it appeared that continued increases in worldwide demand were inevitable.

The United States was uniquely positioned to take advantage of the opportunity provided by expanding international markets in agriculture. We had the world's best technological infrastructure, including superb internal transportation, a system of land grant colleges and agricultural extension services, and plenty of capital for agricultural investment. U.S. farmland was planted from fence row to fence row, and we moved aggressively, building our share of the world grain trade in the late 1970s to a position of such dominance that it enabled some to talk of the possibility of the United States exercising "green power" in a fashion analogous to OPEC's exercise of oil power.

All of this kind had a very positive effect on U.S. trade statistics. The U.S. agricultural trade balance grew from a \$1 billion surplus in 1960 to a \$26.6 billion surplus in 1980. Our very success in building our agricultural export business masked the fact that we were running an increasingly large trade deficit in manufacturing. Without the agricultural surplus, the U.S. trade account would have been in deficit for sixteen of the last eighteen years, instead of only ten of those last eighteen. Our 1981 agricultural trade surplus of over \$25 billion enabled the United States to report a current account surplus of \$6.3 billion.

The 1980s have witnessed a virtually complete reversal. The boom markets of the 1970s have stagnated worldwide as import demand for agricultural commodities slackened. World wheat imports, for example, increased by less than 7 percent over the first four years of the 1980s after growing by 71 percent over the previous ten years. Indeed, from 1981 through 1983 there was *no* increase in the world volume of wheat imports. And this pattern is characteristic of many agricultural commodities in the 1980s.

The conventional wisdom of the impending global catastrophe of world food shortages has been changed in the 1980s: now we live in an era of tremendous agricultural surplus. In mid-1986, for example, the stored grain surplus of the United States and EEC alone amounted to approximately one-sixth of total world consumption, an amount considerably larger than the total volume of grain traded in international markets that year.

As agricultural trade slowed and world stocks expanded, prices fell. Falling prices and incomes are measured in the agony of our farm

economy, with numerous personal bankruptcies, failing agricultural banks, and the great distress of agricultural implement manufacturers and other agribusiness segments.

This agony is compounded by the sharp deterioration of the position of the United States as principal world supplier. Whereas in 1981 a trade surplus of over \$25 billion contributed to a current account surplus of \$6.3 billion, by 1986 the United States had a current account deficit of more than \$100 billion and an agricultural trade surplus of only \$5.4 billion. Furthermore, our share of world grain trade, which was over 50 percent in 1980, had dropped to 34 percent by 1986. For every year from 1980 through 1986, the U.S. share of world grain exports declined, without exception. In the space of seven years we have gone from dominating world trade in agriculture to having a net deficit in agricultural trade for two months last summer.

These are dramatic changes that mark an unprecedented reversal. The question is What caused this dramatic reversal and what does it tell us about the future? And why has the U.S. position of market dominance deteriorated so sharply in this stagnant, oversupplied international market?

The most basic and important long-term cause has been the change in agricultural policies by the governments of countries that were traditionally major agricultural importers. These policies have transformed former importers into self-sufficient and, in some cases, exporting countries. As a result, world import markets have been reduced.

The most important changes are in the lesser developed countries. Today, the conventional wisdom in many of these countries is that the key to economic development lies first in strengthening the agricultural sector of the economy. This is almost a complete reversal of the situation in the 1960s, when most development programs ignored the agricultural sector entirely. The political leaders of LDCs are now recognizing that the agricultural sector offers a number of important opportunities not available in other parts of the economy. Agriculture tends to be much more labor-intensive than manufacturing. Therefore, an investment in the agriculture sector tends to create more jobs. More jobs in rural areas means less urban crowding. Most lesser developed countries have found that the rush to the cities is a socially destabilizing process. Increases in the price of food in a highly urban economy can topple a government. Also, the necessary capital investments required for successful agricultural development tend to be smaller than the capital requirements for manufacturing development projects. Furthermore, many of the roads and other infrastructure improvements required for agriculture also serve other segments of the economy.

The recent *World Development Report* for 1986 issued by the World Bank noted the dramatic effect that third world agricultural policy

changes could have. For instance, the introduction of market incentives for the production of agricultural goods has had stunning results in a number of countries. Chinese wheat production more than doubled over the last ten years, due to the introduction of market incentives.

Technological changes in the agricultural sectors of the LDCs is another important policy-induced factor in increasing their self-sufficiency and reducing import demand. India has gone from being a country plagued by food shortages and starvation to the point where it is now a significant exporter of grains, particularly wheat. While the introduction of new strains of wheat and similar "high technology" efforts have been central to the success of India's Green Revolution, the use of very simple technology has played an important role as well. Improvements in the transportation system and storage infrastructure have cut waste to 20 percent of production from its previous level of 80 percent in the 1950s.

The LDCs are no longer dependent upon the developed countries for agricultural technology. During the 1970s, LDC spending on agricultural research and development tripled. Further, the Office of Technology Assessment, in a recent study, listed twenty-nine different technical areas with at least a medium potential for significant productivity increases in agriculture. In nine of those areas, developing countries are playing a leading role. The OTA also noted that the diffusion of existing agricultural technology was occurring much more rapidly than in the past.

In a few countries, most notably Brazil and Mexico, the government has designed policies expressly to foster the development of agricultural export sectors. This effort has been spurred by the massive foreign debt accumulated during the 1970s, which contributed to the expansion of the international agricultural market in that decade. Mexican production now accounts for more than 50 percent of the consumption of fresh fruits and vegetables in the United States during the winter months. Brazil, with the largest debt of all the third world countries, has expanded soybean exports so that they account for 12 percent of Brazil's total foreign exchange earnings.

Africa is the one part of the world that is a significant food problem area. There is great potential for the expansion of agricultural production in Africa, but the biggest stumbling block is the role of the African governments. With few exceptions, they have managed to effectively thwart any significant increase in agricultural production. Should they adopt constructive agricultural policies in their countries, as some are now beginning to do, they could easily become self-sufficient. This is made clear by the fact that "for the first time in more than a decade and a half, agricultural output in Africa in 1986 grew by more than 3 percent—a figure which is more than the population growth rate,"

according to the executive secretary of the U.N. Economic Commission for Africa.

Developed countries can also create major changes in agricultural trade. The EEC in 1970 was a substantial net importer of grains, with 28 percent of net world imports. In 1985, by contrast, the EEC accounted for 10 percent of net total world exports of grains, in large part due to the production incentives built into the common agricultural policy.

The special political position of the farm community in the United States has also worked to our disadvantage in agricultural trade. That special relationship has been manifested for the past fifty years in a set of agricultural support policies that induce a degree of productive inefficiency: price supports, surplus storage programs, and acreage reduction policies. While these programs were largely irrelevant to U.S. export performance during the boom markets of the 1970s, their inefficiency-inducing effects may be quite significant for American competitiveness in a relatively sluggish and highly competitive world market in the 1980s.

There are at least two reasons beyond the policy considerations discussed above for the current stagnation in agricultural trade. First, the effects of the global recession in the early 1980s have not been overcome in many parts of the world, and personal income growth rates have been sluggish. This is especially relevant because of the strong relationship between rising income and increased food consumption in lesser developed countries. Current statistics show that in developing countries with annual per capita income above \$1,250, food consumption is ten times greater than in those countries with incomes below \$250 per capita.

As per capita incomes increase, diets tend to be upgraded, switching from vegetable protein first to rudimentary baked goods and sugars, and then to meats and poultry. Obviously these kinds of consumption changes would create increased markets for feed grains and processed agricultural goods.

A second factor has been the third world debt crisis. The heavily indebted countries have curtailed agricultural imports and have added aggressive export promotion policies in agriculture. For example, effective January 1, 1987, Nigeria, which was the second largest purchaser of American wheat, has banned all imports of wheat. In the past year and a half, Nigeria has banned imports of rice, corn, vegetable oil, and day-old chicks. The reason is simple—Nigeria cannot afford to import food, given its huge debt service requirements. At independence in 1960, Nigeria was largely self-sufficient in agriculture, and agricultural exports, such as cocoa, peanuts and palm oil, accounted for 70 percent of Nigeria's total export earnings. In 1985, food exports accounted for only 3 percent of total exports and Nigeria had to import

both peanuts and cooking oil. In response to these trends, Nigeria has set an extremely ambitious goal. It intends to make this nation of 100 million people totally self-sufficient in food by the end of 1987. Once there, they intend to stay self-sufficient.

Another example of the impact of the debt crisis in the 1980s is provided by Argentina, whose total foreign debt equals 46 percent of its GNP. Argentina has expanded its agricultural exports by 43 percent in volume in an effort to meet its debt service requirements. Costa Rica, while admittedly not one of the major players in international markets, nevertheless also illustrates in interesting ways the impact of the debt crisis. Reprocessed coffee wastes, which are abundant in that country, are now being used to replace imported corn in the diets of cattle. Such innovations, born of the fear of additional international debt, can have a significant effect in reducing world demand for agricultural imports, when aggregated across many similar countries.

An additional factor that put pressure on U.S. agricultural trade was the strengthening of the dollar between 1980 and 1985, which dramatically raised the price of our exports. Because this increase in the value of the dollar was substantial relative to almost all of the world's currencies, it gave a significant boost to the agricultural export promotion policies of all of our principal competitors. As a result, the United States lost some market share to many other exporters. The post-1985 decline in the value of the dollar has been great relative only to our major industrial trading partners; the value of the currencies of some of our primary competitors in international agricultural markets, such as Argentina, Australia, Brazil, and Canada, has remained relatively low.

The United States has also been hurt by the perception that we are an unreliable supplier. This was an outgrowth of the U.S. grain embargoes, which not only opened the door to new suppliers, as in the case of Brazil and soybeans, but also destabilized established customer relationships as with the Soviet Union. These agreements are only now beginning to be reestablished.

Finally, the increasingly intense, subsidized agricultural trade war being waged with the EEC is hurting our exports. Last August the European community offered butter on international markets at a price that was 3 percent of the EEC's cost to purchase it. The Common Agricultural Program is inducing budget crises in the EEC, but for a number of domestic reasons—particularly the special political position of farmers, notably in France—it is not clear that they will abandon this subsidized trade policy.

While U.S. agricultural trade will not return to the booming situation of the 1970s, conditions *can* be made better than they are now. There is not a single and simple solution, but a package of reforms on several fronts should serve to improve the current picture.

First, the long-term special political position of the farm community in the United States must be transformed. The agricultural support policies that have been in place for the past fifty years are not working now, except as a restraint on our international competitiveness.

The United States needs to replace governmental incentives for production with market incentives. The return on investment for farmers varies dramatically with the size of their farm, the level of sophistication of the farmer, the kind of job the farm represents—full time or part time—and the cost of the major capital factors of land and equipment. In other words, farmers with reasonably priced capital inputs are making money at farming even with today's prices. Small farms, hobby farms, and farms with high-priced assets and heavy interest burdens are in terrible financial shape. Rather than spending \$26 billion to support farm prices for an existing farm, farmers who cannot compete in the new environment must be helped to move to new employment.

We must avoid the temptation to take large quantities of agricultural land out of production by paying farmers for acreage set-asides. This delivers money to the wrong hands and slows down the necessary process of having inefficient farmers leave agriculture. Furthermore, it has the potential of dramatically raising prices for American consumers and absolutely pricing us out of export markets without heavy export subsidies. Congress will not easily give up its special relationship with agriculture, but long-term prospects for America's role in international agricultural trade are rather dim if it does not.

Second, as a step toward reinvigorating the international agricultural markets, the United States should do its part to spur world economic growth, especially in the third world. As much as anything, this probably means avoiding the increasingly strong temptation in Congress to impose import restrictions on manufactured goods from the newly industrialized countries of the third world and more vigorously attempting to reduce our government budget deficit, which annually drains some \$200 billion of potential investment finances out of the world economy. Healthy world economic growth will not resume without a resolution of the debt problems of the lesser developed countries.

Lastly, the United States needs urgently to resolve its growing agricultural trade war with the EEC. International agricultural markets have been more subject to governmental intervention than virtually any other international economic sector. The consequence is a very expensive and market-distorting burden for the world's consumers and taxpayers. We must move now to the bargaining table to negotiate joint reductions in the level of subsidization of agricultural exports.

While the seemingly endless "good times" of the 1970s will not return to agriculture, both the United States as well as individual American farmers must be able to profit from participation in international agricultural markets. We must have the political will to craft our agri-

cultural programs so that they reflect the realities of international markets. U.S. policies must help move the domestic agricultural sector to become an effective competitor in the new world agriculture scenario.

3. John R. Block

Food Policy in an Evolving World Marketplace

I speak from personal experience because I have spent a lifetime in agriculture. I was born and raised on a farm and have lived the agriculture industry from a tractor seat to the cabinet room, and seen a lot of things happen—some of them good and some of them not particularly good.

If you look back to the year 1700, one farmer was feeding three people, only three. By the year 2000, one farmer in the United States will be feeding more than a hundred people. When I was a boy, we had two old horses called Bert and Bill, and my sisters and I milked ten cows with my father, by hand, morning and night. And those old horses pulled a two-row corn planter. It took a long time to plant the corn under those conditions.

Today we have a farming operation of seven people. Those seven people are producing ten thousand head of hogs a year, and three thousand acres of corn and soy beans. Not only is the operation vastly different today, but it is a capital-intensive business. Then it was much more labor-intensive. But also the things you talked about and look toward were entirely different.

As a boy we would bale the hay in the afternoon and, with the hay put away, would sit around visiting with the neighbors. The men were always talking about the weather and a host of things, but they never talked about the international market place. They did not talk about the strength of the dollar; they did not talk about penetrating the Soviet market and sending another million metric tons of wheat into the Soviet Union; they did not talk about any of those things because we had an industry that was labor-intensive. It was national, and in some cases even regional and local, in scope.

We bottled our own milk in the basement and took it and sold it in my grandfather's store. We gathered the eggs and took them to town and sold them in his store. It is certainly not like that today.

Agriculture is a global industry. And for the most part, this has happened in my lifetime and yours. If you look back to the 1930s, 25

percent of the people in this country lived on farms. Today 2 percent live on farms. Even more important, of that small percentage who live on farms and farm, 14 percent of the farmers produce 75 percent of the farm production.

As Bruce Gardner pointed out, when we went into the 1970s, the world market exploded. Earl Butz was out selling grain everywhere, all around the world, and the expectations were just unbelievable. Those expectations carried forward to the day I went to the office of secretary of agriculture. Just two months before I stepped into that chair, the *Wall Street Journal*, on November 28, 1980, was telling the world: "Big increases in food prices loom as world demands more U.S. grain. U.S. can no longer be a bread basket to the world. Food will be in the 80s what oil became in the 70s. Scarce and expensive." It goes on and on, and the situation we know does not resemble anything in that article. It just shows how the whole country and the whole industry and the whole world was caught up in these expectations; it is no different from people who thought we would see \$100 a barrel of oil. The high-price incentive brings on more production, regardless of what it is, and the whole thing collapsed as we went into the 1980s.

In the agricultural industry, prices plunged, and land values declined. Frankly they were in a free-fall in the early part of the 1980s, but they have started to change a little bit now. You sit in the Cabinet Council of Economic Affairs and the cabinet room and you wish you could get your hand on the handle to straighten it out. But there is no handle to pull. Because the handle is all wrapped up in international macroeconomic policies. And no one really understands what those policies are.

So you have got all these problems to deal with, with a strong dollar. Bruce Gardner pointed out that the ability of our customers to buy products from us collapsed, the European economic community turned into a big exporter, and they are subsidizing exports all over the world because they have to get rid of them too—they don't know what to do with the stuff. We have a farm program in place that was put in place in 1981; it, unfortunately, is designed in a way to encourage production. It provides for an escalating support price, escalating target prices, targets and supports that everyone in the world shot for because they knew they were guaranteed. One of the things we have to fix is a farm program that is not related to the conditions of the day. That means lowering supports, and you know how many people want to lower supports under those conditions. That is the kind of situation we wrote the 1985 farm bill under, I might add.

Of course not all farm commodities are given these direct supports. In fact, in dollar terms, more than half of our commodities are not supported this way. They may have some indirect support, however. Wheat, feed grains, rice, cotton and dairy, peanuts, and tobacco are

supported, but all the meats and all the special crops are unsupported. Meats of course get an indirect support because they rely on the grain that must be fed to the animals.

The 1985 farm bill did some good things. We lowered the loan rate dramatically so that we did not have that guarantee to our farmers and the rest of the world that the price was always going to be high. In Bruce Gardner's paper, table 7.6 really shows how the loan rate came down. In some cases it needs to come down still more. Prices in some cases are about half what they once were.

Where are we today? I will talk a little about our domestic farm programs, because you cannot divorce domestic policy from trade policy.

Our domestic policies impact Europe. European domestic policies impact the Caribbean because they are dumping sugar all over the world, depressing the price of sugar. Frankly, they would not be able to compete if they had to do it on an open market. But farm programs in different countries are impacting everyone else in the world.

American agriculture is starting to stabilize somewhat, after being in a free-fall since about 1981 or 1982. Land values, although declining, are not declining as fast today. Exports, in terms of dollar sales and especially in terms of volume, look like they may be starting to turn back up again.

The United States is using a host of subsidy programs to penetrate markets and to pressure the European community into abandoning their farm policies that have been disastrous for us and a lot of other countries.

And we are using our surpluses to push product into the market. We'll sell something, and then we'll give them a little extra wheat so they'll have a good deal, and we'll be able to sell more product that way. We are zapping countries all over the world. We are taking markets away from Argentina by selling beef to Brazil. We took sugar markets from Australia by selling sugar to China. We have everyone in the world angry at us for what we are doing. So we are successful in getting the world's attention that agricultural subsidies are a world problem.

When you look at the rest of the world, a very important point is the battle cry for food self-sufficiency. I think it is going to have a big impact. It is already starting to.

I saw the sands of Saudi Arabia green with wheat. They should not have been raising any wheat there at all, but Saudi Arabia is now a net wheat exporter. They are an exporter of wheat which is absolutely insane. They are paying their farmers a thousand dollars a ton to produce, raise, and sell wheat. I could raise wheat on this floor for a thousand dollars a ton and make money.

But it is a fact of life—there is a battle cry for food self-sufficiency. But wanting it is one thing; knowing how to achieve it is another. Many of them have figured this out because they realize that price incentive

is the way to get it done. Let the prices rise and then technology will flow, and they will produce more food as time goes on.

Technology is flowing now. You get farm people complaining that we are transferring our technology to other countries so they can compete against us. I don't buy that. We do some of that, but technology just plain flows. Technology is for sale. It is for sale because we are a country of private companies.

I went to Hungary a year and a half ago to visit their agriculture experiment station—the most beautiful corn you have ever seen outside of corn in Illinois. What do you think those experiment station people were wearing. They were wearing Pioneer caps, all of them. And that is in Hungary. You can find similar examples everywhere. Technology transfer is occurring.

Finally, the other agricultural exporting countries in the world are feeling a pinch like the United States. In Europe, in many cases, the price of product in real terms has gone down. Their budgets are being taxed to the limit; they are trying to find more revenue to keep their supports in place; and land values have declined, in France in particular.

I have read reports that in Australia, with these lower prices, which is a disincentive to produce wheat in Australia, that by year 1991 their acres in wheat production will be about half what they were at their peak in 1981 or 1982, unless they turn around the policies. And in Canada, they are cutting their acres for corn because the prices are not as attractive as they once were. This tells us that these lower prices are working. But it takes a while for them to work, to put this disincentive through the whole system.

I suggest that the 1985 farm bill will not be changed very much. There is a lot of talk of wild-eyed ideas, like Senator Harkins' supply management, but the closer the proponents of that idea get to it, the more they are going to run away from it like the plague. It would raise the cost of food dramatically, and politically it is an untenable position. I am amazed at Gephardt. I am not amazed at Harkins. That is his populist mentality, but I can not imagine why Gephardt signed on to that kind of approach. I say it is not going to happen.

The administration's dramatic cuts are not going to happen either, this year, because politics will not allow it.

The longer-range solution to the farm problem should involve what they popularly talk about as decoupling, as promoted by Senators Boschwitz and Boren. This solution really says, let's see which farmers receive subsidies, let's figure out about how much they were getting, and let's just give them those subsidies. We'll give them a little less each year, but we won't ask them to do anything. You don't have to cut production; you can go down to the breakers and enjoy the weather; you can do anything you want with those subsidies.

That is a good solution because it buys farmers off of this kick of being on the dole of the farm program. And in the final analysis the farmer will start responding to market signals. The key to it is not to have any production requirements placed on the farmer. Let him raise what he wants, whatever he wants.

The time for that approach has finally arrived. Farmers argue that it is a welfare-type program. Well, call it what you like—I call it a transition program to get out from under the heavy hand of government. I think something like that will be written into the next farm bill, but it is not due to be written until 1990. Maybe they will write it before then, but Congress never does anything until it has to. It won't write a new farm bill until the old one expires.

The rules for trade in agricultural products are going to be written or not written with these GATT talks that we talked about before. It is important that agriculture have a priority there. Writing new rules is going to be enormously difficult because countries are still providing a great many special privileges to agriculture. All over the world, there is no industry that has been given this kind of special consideration. In my judgment, agriculture should not be given special treatment in the world, especially in the developed countries. It should take its place alongside other businesses and industry in the world economy since it is a global industry today. But to break away from these old ties of special support will not be easy. I am optimistic that, given the kind of change we have seen in our lifetimes in trade and agricultural, in the next twenty years we will see more dramatic changes, where many of these national borders will melt away or diminish. And hopefully the tension in the world will diminish as trade tends to increase, and we will have a little safer place in the world.

I will close my remarks by quoting a few words that have to do with food diplomacy, agriculture, and the food industry as the foremost diplomatic tool in world affairs. In fact this quote shows beyond a shadow of a doubt that food and agriculture are the foremost diplomatic tool. This is a letter written to a newspaper in my state of Illinois. Peoria, Illinois, How does it play in Peoria? Well, this was written to a Peoria newspaper. "I saw a newspaper picture of the Soviet Minister of Agriculture holding a pig while standing next to U.S. Secretary John Block who was also holding a pig. A year ago I saw another picture of the President of France and Block, holding pigs, during a visit to Block's Illinois farm. Obviously I'm missing something because I don't understand this. Can you help me."

The newspaper writes back: "Not really. For reasons that not even the State Department understands, whenever foreign dignitaries arrive in the United States, they immediately ask if they can hold a pig with John Block. It's simply one of those international mysteries. It's pig diplomacy."

Summary of Discussion

John Block explained the apparent contradiction between the huge increase in federal farm payments and the desperate shape of so many farmers: most of the money passes through the hands of the farmers on to their bankers. The real question, he said, is how we got to where we are. He proposed that under the scenario given in a 1980 *Wall Street Journal* article that predicted food shortages in the 1980s, the programs as designed would not have been so expensive. In the seventies the same types of programs worked reasonably well, since the farm economy stayed ahead of the support prices. The 1985 farm bill represents some improvement, since the lowering of the loan rate makes agriculture more competitive in world markets, although the outlay is still enormous since the difference was made up with direct payments to farmers. Obviously, farmers have enormous clout in Congress.

Bruce Atwater attributed the special treatment of farm debtors to the strength of the farm block. When small farms approach bankruptcy, there is significant political reaction; when small industrial companies borrow too much, prices fall, and they approach bankruptcy, there is not a similar political reaction. Government lending agencies were encouraging farmers to borrow in the late seventies, since the petrodollars had to be recycled and agriculture was considered to be a sector of comparative advantage. James Schlesinger added that Iowa has an early presidential primary.

Block saw little cause to predict rapid change in the strength of farm interests, pointing out that it is especially difficult to change a program that is already in place. He added that while there are relatively few farmers, rural America, which is closely related to farm America, is very important, since 25 percent of Americans are rural, as are 75 percent of governmental units and 90 percent of natural resources. He predicted nonetheless that we have seen the high water mark for agricultural outlays both in the United States and Europe. The fall in the dollar helps, as does the effect of the 1985 farm bill on export prices, and while Japan says it will be self-sufficient in rice at any cost, it will be importing in ten years. Block noted that it is a myth that the family farm will disappear. Almost all farms are and will be family farms.

Several discussants speculated on the fate of the EEC farm policy. Schlesinger suggested that the EEC situation will fall apart when the Left takes over in the United Kingdom and Germany, as the support for the current conservative governments is very rural, and the high domestic food prices will not be tolerated, particularly at an exchange rate of one DM to the dollar. Atwater disagreed, citing the support of the French government for the current agriculture policy and the pro-agricultural implications of the addition of Spain to the community and the growing strength of Italy. Anne Krueger expressed the belief that

the European common agricultural policy (CAP) would encounter trouble due to budgetary issues within the community, and remarked that the French generated only token flack about the 1986 World Bank *World Development Report*, which was critical of aspects of the EEC farm policy.

The prospects for a large contribution of U.S. agriculture exports to the resolution of the trade imbalance were discussed by several people. Block reported the forecasts of the National Association of Food Producers, which projected an increase of food exports in volume (64 percent) and value (42 percent) by 1991. He expressed less bullishness but agreed that exports would recover, and predicted that imports would increase at a slower pace. He noted that the prospects for serious discussion of agriculture at GATT are good since current U.S. policy of stealing markets from the EEC and LDCs has created a desire in these countries for some rules on trade in agriculture.

Bruce Gardner tempered this optimism with the remark that the striking aspect of the trend in per capita food production since the mid-1970s is not so much that the rate of increase in food production has gone up but that the rate of population growth has slowed. The relationship of this trend to income growth is the key to an increase in food exports; since little can be done to change it, at least in the remainder of the 1980s, this is gloomy news for agricultural exports.

Krueger saw hope for U.S. agricultural exports in the immanent changes in EEC policy, in the prospective takeoff of Japan and Korea as food importers, and in the importance of the dollar exchange rate in agricultural trade. She noted that while macro forecasts often turn out to be self-fulfilling, micro forecasts are generally the reverse of the truth.

Jack Sawyer suggested that economists not ignore questions of political economy. For example, on the issue of competitiveness, much of the current discussion is couched in overly general language. He wondered if some politically useful ideas about entitlement programs could not be framed in terms of consumption subsidies and savings incentives. Peter Peterson predicted an eventual revolution against the entitlement constituencies, but pointed out that currently there is no sign of this. A modest proposal to reduce the COLA frequency from twice to once per year generated armfuls of negative mail, for example.