

ECONOMIC COMMENTARY

The Decline in U.S. Agricultural Exports

by Gerald H. Anderson

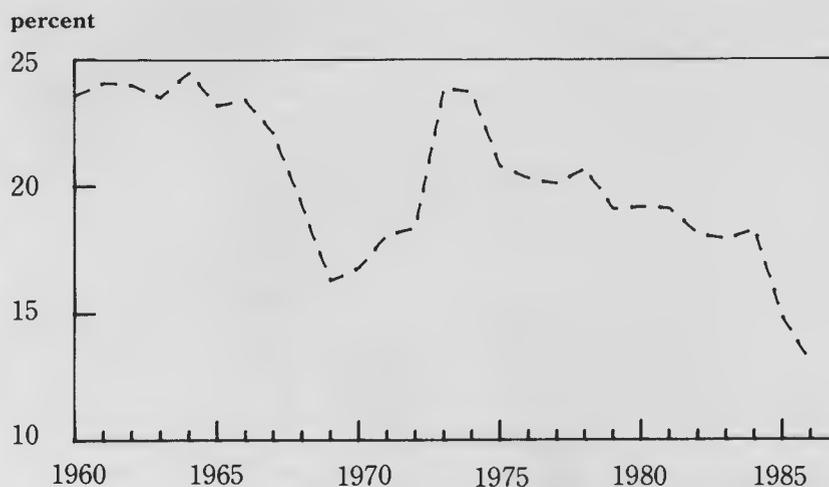
Agriculture has always been a show-piece of American technology, efficiency, and productivity growth.¹ Less than 3 percent of U.S. workers are engaged in farming, yet our farms produce enough to feed our population, to add to domestic surpluses, and to export enormous quantities. Agricultural exports have made major contributions to our merchandise trade balance, accounting for about one-fifth of total U.S. exports in the last 25 years.

The most recent developments in agricultural exports, though, are in sharp contrast to the strength agricultural trade has demonstrated over the years. After peaking at \$44 billion in 1981, agricultural exports fell rapidly to only \$26 billion in 1986 (table 1). As a share of total U.S. exports, agricultural exports fell from 19 percent to 13 percent over the same period (see chart).

This unexpected, rapid export decline has attracted great attention and concern, especially because it compounds the difficulties plaguing the domestic farm sector and exacerbates the already large deficit in our merchandise trade balance.

The decline in agricultural exports is complex. It is more than just simple participation in the general decline that U.S. exports have experienced in the 1980s. From 1981 to 1986, agricultural exports shrank by 40 percent, while nonagricultural exports declined by less than 5 percent (table 1). The agricultural decline stems from a combination of U.S. farm policy, sharp appreci-

CHART 1 Ratio of Agricultural to Total Exports



SOURCE: USDA, *Agricultural Outlook Year Book Issue*, October 1986, p. 37.
USDA, *Foreign Agricultural Trade of the United States*, November/December 1986, p.6.

ation of the dollar, the international debt problem, and increased foreign agricultural output.

Recent changes in U.S. farm policy and the dollar depreciation that began early in 1985 will no doubt stimulate agricultural exports. However, it is unlikely that agricultural exports will return quickly to the level of 1981 because a substantial surplus in world agricultural capacity probably will con-

tinue to restrain U.S. farm exports for many years.

The Decline in Exports

The decline in exports has been concentrated in feed grains (mostly corn), wheat, oilseeds (mostly soybeans), rice, and cotton. Together, these products account for about two-thirds of U.S. agricultural exports. Annual exports of these commodities fell by \$16.5 billion

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1. For example, in the last 25 years, real farm output per hour of farm work has almost quadrupled. See *Economic Report of the President*, February 1986, p. 361.

between 1981 and 1986, accounting for 94 percent of the decline in total agricultural exports (table 2). Exports of most other agricultural products also fell, with the notable exception of animals and animal products.

The export revenue decline resulted both from reduction in export volumes and falling export prices. The physical volume of exports of major crops fell sharply between 1981 and 1986, with declines ranging from 8 percent to 60 percent (table 2). In addition to hurting the farm sector, these declines in physical volume caused losses of business for the firms involved in transporting agricultural products. Prices of agricultural exports declined by amounts ranging from 24 percent to 44 percent (table 2).

U.S. agricultural exports have declined to almost every important customer country or region. From 1981 to 1986, exports to the industrialized nations of Canada, Japan, and Western Europe fell 33 percent, exports to Latin America fell 48 percent, and exports to the rest of the world fell 46 percent. Within these groupings there were wide divergences; for example, exports to China fell 95 percent, exports to Japan fell 24 percent, while exports to Taiwan were unchanged.

Reasons for the Decline in Agricultural Exports

Exports declined in the 1980s because foreign agricultural production accelerated, many customer and competitor nations experienced financial difficulties, and a combination of dollar appreciation and the effects of government farm programs made American products less competitive in world markets.

Most of our export decline is in cereals—primarily corn, wheat, and rice. A major cause of this decline is the fact that foreign production of cereals accelerated while population growth slowed. Per capita production of cereals outside the United States increased only 0.6

percent annually from 1975 to 1981, but accelerated to a 1.4 percent annual growth rate in the 1981-1985 period.

More rapid growth of cereals production abroad relative to population has hurt U.S. exports in two ways. First, importing nations have less need to import grains to supplement their domestic production. Second, our foreign competitors have greater surpluses to export to other markets, where they compete with U.S. grains. These developments can be seen by comparing consumption and export data averaged for 1981 and 1982 with data averaged for 1985 and 1986. Using two-year averages reduces any distortions from unusual years.

First, although world consumption of grains increased 8.5 percent over the period, consuming nations became more self-sufficient and world imports fell 5.4 percent (table 3). Thus, the market for total grain exports shrank significantly. Second, increased production by competitors enabled them not only to capture larger shares of the shrinking world market, but to actually increase their sales. From 1981-82 to 1985-86, world grain imports fell 11.4 million metric tons, but other countries increased their grain exports by 20.6 million tons, while U.S. exports fell by 32 million tons. This pattern of absolute U.S. export losses and absolute competitor export gains in the face of a shrinking total export market existed for each major grain, that is, for wheat, rice, and feed grains (table 3).

U.S. grain exports were also hurt because the U.S. is more specialized in feed-grain exports than in wheat, in terms of both absolute tonnage and market share (table 3). The world market for feed-grain exports shrank much more sharply than the market for wheat, with feed grains shrinking 9 million tons (8.7 percent) and wheat

Table 1 U.S. Agricultural Exports 1960-1986 (fiscal years)
(billions of dollars)

Year	Agricultural Exports	Non-agricultural Exports
1960	4.5	14.6
1965	6.1	20.2
1970	7.0	34.3
1975	21.8	83.2
1980	40.5	169.8
1981	43.8	185.4
1982	39.1	176.3
1983	34.8	159.4
1984	38.0	170.0
1985	31.2	179.3
1986	26.3	176.6

SOURCE: USDA, *Agricultural Outlook Yearbook Issue*, October 1986, p. 37.

USDA, *Foreign Agricultural Trade of the United States*, November/December 1986, p.6.

shrinking 2 million tons (1.7 percent).

Our major competitors—Argentina, Australia, and Canada—have fared much better than the United States in the 1980s. From 1981-82 to 1985-86, their combined grain export tonnage increased 15 percent, including a slight decline in exports from Canada. Canada's decline, 4 percent, is far less than the U.S. decline of 28 percent.

Cereals output accelerated for reasons that vary from country to country, but in general it was not because of an increase in acres harvested. Cereals acreage harvested in the world, excluding the United States, increased only 0.5 percent between 1980 and 1985, while yield per acre rose almost 15 percent. Output per acre can increase either because more fertilizer or pesticides are used to aid production, improved varieties of seeds are intro-

duced, irrigation is improved, farming techniques are improved, weather is more favorable than usual, or because improved economic incentives result in more careful attention to crops by workers. Improvements in transportation and storage facilities can also increase the percentage of a harvest that safely reaches the final consumer. Weather in the major grain-growing regions outside the United States has apparently not been any more favorable in the 1980s than in the 1970s, so weather probably is not among the reasons for the recent acceleration in foreign cereals production.

Agricultural output in China expanded by about one-third between 1980 and 1985, making China the world's largest wheat producer. This expansion was achieved with almost no increase in acres planted or in the use of fertilizer or improved seed varieties; improved economic incentives to farm workers caused most of the output gain.² In contrast, food output in India has increased because of "...a combination of large investments in irrigation, introduction of high-yielding grain varieties, and increases in farm prices."³ Regardless of the reasons for the output gains, the result has been sharp declines in U.S. exports to China and India.

The partial embargo on U.S. grain sales to Russia from January 1980 to April 1981 encouraged grain production in other countries. In response to the Soviet invasion of Afghanistan, the United States limited grain sales to the Soviet Union to the minimum required by the U.S.-U.S.S.R. grain sales agreement. When Russia turned elsewhere to meet its import needs, producers in other countries had an incentive to increase their output to serve the Soviet market.⁴ In fiscal 1986, the Soviet Union did not purchase even the minimum amount of grain required by the Soviet-American long-term grain sales agreement and, according to preliminary data, U.S. exports to the U.S.S.R. fell to about 30 percent below their 1981 level.⁵

Table 2 U.S. Agricultural Exports by Component
(fiscal years)

Product	Value ¹		Volume ²		Price ³	
	1981	1986	1981	1986	1981	1986
Feed grains	10.4	3.7	69.0	36.0	150.73	103.95
Wheat	7.7	3.3	42.4	25.5	182.43	127.85
Oilseeds and products	9.3	6.3	29.8	27.6	312.23	227.39
Rice	1.5	0.6	3.2	2.4	484.70	271.80
Cotton ex linters	2.2	0.7	1.2	0.5	1,843.55	1,406.49
Product	81-86 Change	81-86 % Change	81-86 Change	81-86 % Change	81-86 Change	81-86 % Change
Feed grains	-6.7	-64.4	-32.9	-47.7	-46.78	-31.0
Wheat	-4.4	-57.1	-16.8	-39.7	-54.58	-29.9
Oilseeds and products	-3.0	-32.3	-2.2	-7.5	-84.84	-27.2
Rice	-0.9	-60.0	-0.8	-24.9	-212.90	-43.9
Cotton ex linters	-1.5	-68.2	-0.7	-60.2	-437.06	-23.7

1. Billions of dollars.
2. Million metric tons.
3. Dollars per metric ton.

SOURCES: USDA, *U.S. Foreign Agricultural Trade Statistical Report, Fiscal Year 1981*, April 1982, Table 15; and USDA, *Foreign Agricultural Trade of the United States*, November/December 1986, Table 5; and USDA, *Foreign Agricultural Trade of the United States Fiscal Year 1985 Supplement*, March 1986, Table 4.

The debt problem affecting many developing nations also appears to have contributed to the fall-off in U.S. agricultural exports. In 1982, it became apparent that, because of high real interest rates and other problems, many developing nations were having difficulty servicing their foreign indebtedness.

Difficulty servicing debt would cause a reduction in U.S. agricultural exports in several ways. Debtor countries could restrict agricultural imports to conserve foreign exchange. Austerity programs required by the International

Monetary Fund (IMF) and creditor banks as a condition for restructuring existing loans, or making new loans, could cause debtor-nation income to fall and thus reduce the demand for all goods, including U.S. agricultural exports. Creditor banks could lend less additional money to heavily-indebted nations for use in financing agricultural imports. Debtor nations that subsidize food consumption could reduce those subsidies, thereby reducing effective demand for food. Debtor nations could encourage domestic agricultural production to reduce the need for imports. Debtor nations such as Argentina,

2. World Bank, *World Development Report 1986*, pp. 104-106; and *Economic Report of the President*, January 1987, pp. 167-8.

3. World Bank, *ibid.*, p. 89.

4. See *Embargoes, Surplus Disposal, and U.S. Agriculture*, Economic Research Service, U.S. Department of Agriculture, Staff Report #AGES860910, November 1986, especially pages 10-4 and 10-5.

5. Some analysts argue that the United States defaulted on the U.S.-U.S.S.R. agreement by not offering to sell grain to the U.S.S.R. at the world market price.

which export agricultural products that compete with U.S. products, could encourage greater agricultural exporting in order to increase their earnings of foreign exchange. And debtor nations could devalue their currencies in real terms relative to the U.S. dollar, making food imports more expensive and food exports more competitive.

There is apparently no econometric study that attempts to quantify the relationship between the foreign debt problem and U.S. agricultural exports. However, agricultural imports of a group of 10 major debtor nations declined 24 percent between 1981 and 1984. Moreover, U.S. agricultural exports to Latin America, which includes most of the large, heavily indebted nations, fell by nearly one-half between 1981 and 1986. U.S. exports to Mexico, where debt difficulties have been severe, fell almost 60 percent.

Dollar appreciation in the 1980s also contributed to the decline in U.S. agricultural exports. One popular measure, the Federal Reserve Board's trade-weighted average index for the dollar, rose by 83 percent between the third quarter of 1980 and the first quarter of 1985. If it were adjusted for inflation, the index would have risen 74 percent. Dollar appreciation makes U.S. exports more expensive in foreign currencies, decreasing foreign demand and encouraging foreign supply. The exchange rate elasticity of U.S. agricultural exports was found to be -0.71 over a recent 13-year period.⁶ That means that a 1 percent real appreciation of the dollar would cause a 0.71 percent decline in U.S. agricultural exports, assuming nothing else was affecting the exports. Assuming that relationship was valid in the 1980s, the 74 percent real dollar appreciation would have tended to cause a 53 percent decline in U.S. agricultural exports by

mid-1986. In fact, exports fell from \$43.8 billion in 1981 to \$26.3 billion in fiscal 1986, a 40 percent decline.

Domestic farm policies also have hurt U.S. agricultural exports. There are, of course, a wide range of farm policies and programs. Some have encouraged research into better farming methods, led to development of improved animals, seeds, pesticides, and fertilizer, improved irrigation and soil conservation, facilitated the dissemination of technical information, and provided financial incentives to increase production. These have all helped to increase farm output, making products available for export if buyers could be found. However, policies designed to support farm incomes have raised prices of farm products, making it more difficult to sell those commodities in the international market.

The Agricultural Adjustment Act of 1933 established the Commodity Credit Corporation (CCC) to help support farm incomes. In one important program, the CCC establishes loan rates for crops such as corn, wheat, and soybeans. For example, in the 1985-86 crop marketing year, the loan rate for corn was \$2.55 per bushel. An eligible farmer could use his corn harvest as collateral for a loan from the CCC, borrowing \$2.55 for each bushel of corn offered as collateral. If the market price of corn subsequently went high enough, a farmer could repay his loan, with interest, and sell his corn in the market. However, the CCC loan is a nonrecourse loan, which means that if the farmer chooses to let the CCC keep the corn, his obligation to repay the loan and pay the interest is forgiven. Obviously, that is what a farmer will do if the market price of corn is below the loan rate, plus interest. In effect then, the CCC

loan program puts a floor under the price of corn produced by farmers eligible for CCC loans. If the loan rate is higher than the market price, eligible farmers will, in effect, sell their corn to the CCC instead of in domestic or export markets. The law prevents the CCC from reselling the commodities at prices below the loan rate. Usually, enough farmers will enter the program to keep the market price at or above the loan rate.

To be eligible for the loan program, a farmer usually must keep a certain percentage of his land out of production. In 1985, for example, a farmer had to idle 10 percent of his land to be eligible for CCC loans on corn. Some farmers produce corn on all of their land, foregoing CCC program eligibility. A farmer who foregoes program eligibility is in essence betting that the profit from corn produced on 100 percent of his land and sold at market price will exceed the profit from producing corn on 90 percent of his land and selling it to the CCC at the loan rate, plus collecting any associated "deficiency payments."

For many crops, including corn, eligible farmers may also receive direct payments from the CCC based on a target price for their crop. These deficiency payments equal the difference between the target price and the greater of either the loan rate or the market price, times the number of bushels produced. Thus, in choosing whether to become eligible for the program, a farmer considers the target price instead of the loan rate.

In the early 1970s, loan rates were low relative to market prices determined by supply and demand, so the loan rates did not affect market prices. In the mid-1970s, loan rates were raised rather sharply and became in some years a support to the market prices. U.S. exports were able to continue

6. The relationship was estimated for the period first quarter 1971 to first quarter 1984, using a CPI-inflation-adjusted version of the Federal Reserve Board's trade-weighted index for the dol-

lar. The effect of the real exchange rate change on agricultural exports was found to occur during the following five quarters. See Batten, Dallas S. and Michael T. Belongia, "The Recent

Decline in Agricultural Exports: Is the Exchange Rate the Culprit?" *Economic Review*, Federal Reserve Bank of St. Louis, October 1984, vol. 66, no 8, pp. 12-13.

growing, however, because the dollar was rather weak in foreign exchange markets. But after 1981, as the dollar continued to appreciate, high loan rates prevented U.S. market prices from falling in response to dollar appreciation, and U.S. exports suffered major losses of market share.

Outlook for Agricultural Exports

It is quite likely that U.S. agricultural exports have bottomed and are now improving. However, a quick return to the high level of exports of five years ago seems unlikely.

A major favorable development for agricultural exports was enactment in December 1985 of the Food Security Act. This new farm law is lowering the loan rates for grains and soybeans to allow these products to become more competitive in world markets. For example, the loan rate for wheat fell from \$3.30 per bushel in the wheat marketing year that ended on May 31, 1986 to \$2.40 for 1986-87 and \$2.28 for 1987-88. As the reductions in prices take hold, the volume of U.S. agricultural exports should rise. Of course, export earnings will not rise proportionately, and might even fall initially, because of the lower prices that will be received.⁷

The Food Security Act also provides a new marketing loan program for producers of rice and cotton. Under the program, CCC loans on rice and cotton can be paid off at the market rate for the product, even if that is below the loan rate. Thus, producers are encouraged to export at the world price rather than transfer ownership of the commodity to the CCC. The program went into effect in April 1986 for rice and in August 1986 for cotton; it is already boosting exports. Export volumes for rice and cotton are forecast to increase 9 percent and 171 percent, respectively in fiscal 1987 from fiscal 1986. However, export prices for rice and cotton

Table 3 World Exports, U.S Exports' Share of World Exports and Exports as Share of World Consumption^a
(million metric tons and percent)

	Two-Year Average 1981-82 ^b	Two-Year Average 1985-86 ^c	Change	% Change
Wheat				
Total world exports	97.7	96.0	-1.7	-1.7%
U.S. exports	44.7	31.8	-12.9	-28.9%
U.S. share world exports	45.8%	33.1%	-12.7 percentage points	
Total world consumption	443.7	497.3	53.6	11.2%
World exports as share of world consumption	22.0%	19.3%	-2.7 percentage points	
Rice				
Total world exports	12.5	11.7	-0.8	-6.4%
U.S. exports	3.9	2.7	-1.2	-30.8%
U.S. share world exports	31.2%	23.1%	-8.1 percentage points	
Total world consumption	276.9	313.8	36.9	13.3%
World exports as share of world consumption	4.5%	3.7%	-0.8 percentage points	
Feed grains				
Total world exports	102.3	93.4	-8.9	-8.7%
U.S. exports	65.2	47.3	-17.9	-27.5%
U.S. share world exports	63.7%	50.6%	-13.1 percentage points	
Total world consumption	742.4	776.2	33.8	4.6%
World exports as share of world consumption	13.8%	12.0%	-1.8 percentage points	
Total grains				
Total world exports	212.5	201.1	-11.4	-5.4%
U.S. exports	113.8	81.8	-32.0	-28.1%
U.S. share world exports	53.6%	40.7%	-12.9 percentage points	
Total world consumption	1462.4	1587.2	124.8	8.5%
World exports as share of world consumption	14.5%	12.7%	-1.8 percentage points	

a. World exports exclude intra-EC trade.

b. Crop market years 1980-81 and 1981-82.

c. Crop market years 1984-85 and 1985-86.

SOURCE: USDA, *Agricultural Outlook Yearbook Issue*, October 1986, tables 16 and 21.

7. The conclusion that a decline in export prices will increase export earnings assumes that foreign demand for U.S. agricultural exports is price elastic, that is, a one percent decline in export price will lead to an increase in export volume exceeding one percent. However, the price elasticity of agricultural exports is still a matter of debate among agricultural economists. See

"Challenge to the Economics Profession: World Agricultural Trade in a New Environment," remarks delivered by Robert L. Thompson, Assistant Secretary of Agriculture for Economics, at the International Banquet, American Agricultural Economics Association, Reno, Nevada, July 28, 1986, p. 12. Some researchers expect export revenues to fall initially, declining by about 7

percent in 1986-87, because they estimate the short-run price elasticity to be about 0.5. See *The Food Security Act of 1985: A Ten-Year Perspective*, Food and Agricultural Policy Research Institute, Iowa State University, July 1986, pp. 21-22. The U.S. Department of Agriculture expects export earnings to be the same in 1986-87 as in 1985-86. See USDA, *Outlook for U.S. Agricultural Exports*, December 2, 1986, p. 1.

in August 1986 were 30 percent and 54 percent below their year-earlier levels, respectively, which will restrain the change in export earnings. Moreover, because rice and cotton together have accounted for less than 9 percent of agricultural exports in recent years, this program is likely to contribute a relatively small improvement to total agricultural exports.

In another new program authorized by the Food Security Act, the CCC began in January 1986 to issue generic commodity certificates in lieu of a portion of the cash payments due to producers participating in CCC grain and cotton programs. These certificates can be used to repay CCC crop loans, but the loan collateral is redeemed at market price instead of at the loan rate. In effect, the certificates convert a portion of crop loans to marketing loans similar to those available for rice and cotton. Thus the certificates program tends to make U.S. crops more competitive in world mar-

8. The U.S. Department of Agriculture (USDA) publishes an inflation-adjusted trade-weighted dollar index with weights based on each nation's purchases of U.S. agricultural exports, but exchange rates for competitor countries' currencies are not included. It is not appropriate to use that index in this calculation because that is not the

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kets. The certificates are generic in that they can be used in connection with any crop held by the CCC, but most have been used to obtain corn.

The depreciation of the dollar since early 1985 holds the promise of a substantial increase in agricultural exports. The Federal Reserve Board's trade-weighted average index for the dollar, if adjusted for inflation, fell 31 percent from first quarter 1985 to fourth quarter 1986. If the relationship reported above holds for this period, agricultural export revenues should increase by 22 percent in response to that exchange rate change. Unfortunately, some of that benefit will have already been felt so only a portion of it lies ahead. Also, one should be cautious about forecasting the improvement to exports from dollar depreciation because the Federal Reserve Board's dollar index excludes the currencies of many important customer

index used in the Batten-Belongia study cited above. For the USDA index see USDA, *Agricultural Outlook*, January-February 1987, table 27.

9. Referring to world capacity, D. Gale Johnson asserts "We have created substantial excess production capacity in agriculture that will haunt us for most of the rest of this century. Even if appropriate policies started tomorrow, it would

and competitor nations. Therefore, the relationship between that index and exports, estimated for the past, might not hold for the future.⁸

Overall, the combined effects of the Food Security Act and dollar depreciation are likely to be favorable for U.S. agricultural trade. But the increased production capacity abroad will remain, and there is likely to be excess capacity in world agriculture for many years.⁹ Because of this excess capacity, any decline in U.S. export prices will encourage price declines abroad, thus hampering U.S. efforts to regain market share.

The excess worldwide capacity in agriculture has been partially offset in recent years by reductions in U.S. exports. While price reductions can increase the quantity of agricultural products demanded in the world, it is unlikely that prices will fall enough to eliminate the excess world capacity or to raise U.S. exports in the next few years to their levels of five years ago.

take the EC and the United States nearly a decade to eliminate this excess capacity...." See his "Commentary on Exhancing Competitiveness: International Economic Policies," *Competing in the World Marketplace: The Challenge for American Agriculture*, A Symposium sponsored by the Federal Reserve Bank of Kansas City, October 31-November 1, 1985, p. 109.

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