CHAPTER 4

Food and Agriculture

AMERICAN AGRICULTURE is one of the most successful examples of agricultural development in the world. The industry is very productive: only 3.1 percent of the civilian labor force produces enough to feed the entire domestic population at low cost and still export enough to earn almost 20 percent of the total export revenue of the United States. Although farmers in most countries earn much lower incomes than nonfarm workers, the average disposable income of the U.S. farm population over the past decade has averaged close to that of workers in the rest of the economy. Average wealth per farmer is much higher than of people employed in the rest of the economy, and half of American farmers have no debt.

Despite these successes, all is not well with American agriculture. Farm export earnings and asset values have declined for the past 2 years. Recent entrants and farmers who have recently expanded their businesses have experienced cash flow difficulties. Although the farm bankruptcy rate is well below that for nonfarm businesses, the number of farm bankruptcies has substantially increased. The fraction of the farm population with incomes below the poverty level is still almost double that for the nonfarm population.

In fiscal 1983, Federal Government outlays for farm price and income support programs totaled $18.9 billion, an increase of $12.3 billion in 2 years. To this must be added another $9.4 billion worth of payment-in-kind (PIK) commodities committed in 1983 to compensate farmers for reducing their crop acreage in order to reduce inventories. These programs cost taxpayers almost $12,000 per farm. While Federal expenditures have been curtailed in many domestic program areas, the cost of farm programs has exploded.

Farm programs affect not only the taxpayer but also the consumer. Some farm policies clearly benefit the consumer. In particular, federally sponsored research has lowered food costs by generating a steady increase in agricultural productivity. Other policies artificially raise food prices through price supports and restrictive marketing and trade practices. This reduces consumers' purchasing power.

The present Federal farm programs were designed to address the problems of farming as it existed in the 1930s, but American agricul-

ture has changed dramatically since then. Farming has become a much more specialized, capital-intensive, and high-technology business. Many people justify farm income and price support programs on the basis of low farm incomes. But average farm family incomes of the commercial producers, to whom most benefits of the Federal programs go, are above income levels in the rest of the economy. Net farm incomes, however, vary substantially from year to year.

Exports now account for one-quarter of all farm sales. Yet present price support programs, along with the strong dollar, make U.S. agricultural products less competitive on world markets. If we value the foreign exchange earnings generated by farm exports and the market this provides for a quarter of the Nation's farm sales, our farm price and income support policies must become more market oriented than they are now.

THE FOOD AND AGRICULTURAL SECTOR

In 1982 the farm sector employed 3.1 percent of the U.S. civilian labor force and generated 2.4 percent of national income. In 1930, for comparison, 22 percent of the labor force was employed in farming and produced 9 percent of national income. With this shift have come increases in employment and income in industries producing goods and services purchased by farmers and processing farm products. Farmers now spend almost half of their gross income on inputs, such as seed, feed, pesticides, fuel, and fertilizers, 58 percent of which is produced in the nonfarm sector. After the products leave the farm, for every dollar's worth of sales destined for domestic consumption, processing, packaging, transportation, and other services add another $2 before it reaches the retail purchaser.

FARM INCOME

In 1983 farm cash receipts from product sales totaled about $144 billion (Table 4–1). This includes the net purchases by the government to support the prices farmers received for grains, cotton, tobacco, and milk. For example, to support the price of milk the government purchased $2.7 billion worth of dairy products. American farmers also received direct government payments in cash and in kind totaling about $9 billion. These total less than the fiscal 1983 budget authority for price and income support programs because part of those outlays occurred in the fourth quarter of 1982 and because farmers will take delivery of over half of their PIK commodities in 1984. The PIK program was designed to reduce the stocks that had accumulated following 2 years of bumper crops and weak demand,

particularly from exports. The acreage cutbacks, plus the severe drought of 1983, reduced grain and cotton inventories by $9 billion.

Gross income of the farm sector totaled $159 billion. Production expenses, which dropped substantially from 1982 because of reduced plantings, came to $136 billion. This left net farm income of $23 billion, up marginally from 1982. Net cash income, which excludes nonmoney income, the value of inventory change, depreciation, and perquisites to hired labor, reached a record high of $43 billion in 1983. In addition, farmers earned $41 billion of income from nonfarm sources.

TABLE 4-1.—*Farm income, 1980-83*

[Billions of dollars]

Item	1980	1981	1982	1983 [1]
Gross farm income	150.1	167.1	162.2	158.6
Cash receipts	140.0	140.3	135.5	144.4
Net CCC loans	0.5	2.0	9.1	−2.0
Direct Government payments [2]	1.3	1.9	3.5	9.1
Other cash income [3]	1.6	2.0	2.1	1.9
Nonmoney income [4]	12.1	13.3	13.9	14.0
Value of inventory changes	−5.3	7.6	−1.9	−8.8
Production expenses [5]	128.6	137.0	140.1	136.0
Net farm income	21.5	30.1	22.1	22.6
Addenda:				
Net cash income [6]	38.1	34.7	36.3	43.4
Off-farm income	37.7	39.9	39.4	40.8
Change in loans outstanding [7]	15.2	15.5	6.8	3.8
Capital expenditures	18.0	16.8	13.9	14.1

[1] Preliminary.
[2] Cash Government payments, except 1983, which includes $4.2 billion of payment-in-kind (PIK) commodities.
[3] Custom work, machine hire, and farm recreational activities.
[4] Value of home consumption of farm products and imputed value of dwelling.
[5] Cash expenses plus depreciation and perquisites to farm labor, but excluding expenses associated with farm dwellings.
[6] Excludes nonmoney income, value of inventory change, depreciation, and perquisites to hired labor. Includes net Commodity Credit Corporation (CCC) loans.
[7] Excludes CCC loans.

Source: Department of Agriculture.

As officially defined, a farm is a place that sells at least $1,000 worth of agricultural products per year. So defined, there are 2.4 million farms, which in 1982 had an average net income from farming of $9,188 and an average income from nonfarm sources of $16,430, for a total $25,618. The average family income for the whole population that year was $27,391.

More than one-third of the 2.4 million farms sell less than $5,000 worth of products per year, and 71 percent sell less than $40,000. These smaller farms are not generally full-time commercial operations, produce only a small share of national farm production, and, on average, have negative net income from farming.

The 29 percent of the farms with annual sales of more than $40,000 generate 87 percent of total farm receipts. In 1982 these 690,000 commercial farms had average annual gross receipts of about $190,000 and net farm income of about $36,000. Their net

farm income, however, varies substantially from year to year. These farms have average assets of about $1 million and average equity of about $800,000. This group received 78 percent of all direct government payments under farm programs in 1982. This accounted for 11 percent of their net farm income. These averages mask considerable diversity. For example, the largest 1 percent of all farms, which have annual sales of over $500,000, produce 30 percent of all farm sales.

SPECIAL CHARACTER OF FARMING

The commercial farm, like the small manufacturer, is a business that buys raw materials, transforms them through a capital-intensive process, and sells the finished products.

How then does a modern commercial farm differ from a small manufacturing company? Its most distinguishing characteristic is a biological production process that involves lags arising from growth cycles. This severely constrains the speed with which farmers can respond to changing market conditions. In addition, the volume of farm production is less predictable than in the nonfarm economy because of the random effects of weather, disease, insects, and genetics. These supply conditions contribute to substantial year-to-year variability in farm incomes. Since the annual output of major field crops is harvested within a few weeks in the autumn, this requires storage capacity for most of a year's output.

Agriculture and manufacturing also differ in the role played by land. Because crop production and livestock grazing are land based, they have to be dispersed over a wide geographic expanse from which the marketing system must assemble the production. The geographic differences in climate and soil limit what products can be produced in each location.

Land has characteristics that distinguish it from other inputs. As the demand for land increases, users must bid against a relatively fixed supply. They bid on the basis of expected future returns to the use of that land. The price of farm land increases in response to expectations of higher returns—whether from strong demand for what it can grow, from inflationary expectations, or from artificial price enhancement associated with government policy. Appreciation of land prices tends to increase the wealth of its owners, and often represents a significant fraction of an owner-operator's total returns. It also raises the entry cost for new farmers. Physical capital, being reproducible, tends not to appreciate over time in this manner, but rather to depreciate.

A third way in which farms differ from manufacturing plants is in the proportions in which they use labor and capital. Most farms are family owned and operated, with little hired labor. (Only 0.2 percent

are owned by nonfamily corporations.) In 1979 American agriculture used $43,000 of physical capital stock (machinery and buildings) per worker, compared with $21,500 for the economy as a whole. Farming used three times as much physical capital per unit of production (GNP basis) as the average for the total U.S. economy. In both agriculture and the rest of the economy, this capital stock tends to be quite specialized, although machinery used to produce field crops has multiple uses.

FIVE DECADES OF CHANGE

In the 20th century the structure of U.S. agriculture and the well-being of farmers have undergone profound change. Farm production has tripled, while employment in agriculture has fallen by 80 percent (Table 4–2). The increase in labor productivity and, in turn, farm family income was achieved by improving technology and by increasing the land and capital used per worker. As a result, employment in farming fell substantially.

In the 1930s disposable farm family income per capita was less than 40 percent of that in the rest of the economy. Over the past decade, however, farm family income has averaged 88 percent of that in the rest of the economy and exceeded that in the nonfarm sector in 1973. This income differential was the driving force behind the structural change in agriculture. As the proportion of the labor force employed in agriculture fell and the proportion employed in higher productivity nonfarm employment rose, migration contributed to national economic growth.

The rate of migration from farming to the rest of the economy was strongly motivated by the income differential. As the differential narrowed in the 1970s, the rate of migration slowed. The rate has also been sensitive to the nonfarm unemployment rate—slowing when the perceived chances of getting a nonfarm job were low and accelerating when the unemployment rate fell.

Rural industrialization has increased the number of off-farm jobs in rural America. Most farmers who did not acquire more land and capital have become part-time farmers; almost two-thirds of all farm family income now comes from nonfarm sources. This additional farm family income has reduced significantly the farm-nonfarm income differential.

The number of farms and the farm labor force peaked during the 1930s. Employment in farming went into a pronounced decline after World War II, when a major technological revolution occurred in agriculture. The replacement of draft animals by the tractor, which had begun in the 1930s, was virtually completed by 1960. This released

about one-fifth of our cropland, which had been used to grow feed for draft animals.

The increased mechanization of farming permitted the amount of land cultivated per farm worker to increase five-fold from 1930 to 1980. The amount of capital used per worker increased more than 15 times in this period. As Chart 4–1 shows, total farm production grew 140 percent, but total input use rose only 5 percent. Total productivity (production per unit of total inputs) more than doubled because of adoption of agricultural research results such as hybrid seeds and improved livestock feeding. Table 4–2 illustrates that use of both agricultural chemicals and feed grew very rapidly in the postwar period. Agricultural production now relies heavily on the nonfarm sector for machinery, fuel, fertilizer, and other chemicals. These, not more land or labor, produced the growth in farm production. These changes have also greatly increased the capital investment necessary to enter farming; they have also generated new requirements for operating credit during the growing cycle.

Education has been an important stimulus to growth in the economy as a whole and agriculture in particular. Rural education facilitated the move from farm to off-farm jobs. As the rate of technological change accelerated, rural education also helped farmers to adopt new technology and adjust to technological change.

The farm sector has undergone a major shift in what it produces. Total farm production is now split about equally between crops and livestock, as it was early in the century. The composition of each, however, has changed in response to changes in demand and in technology. In value terms, the largest increases have been in beef cattle and oilseeds production and to a lesser extent in feed grains and poultry. The proportions of cotton, hogs, eggs, sheep, lambs, and wool in farm output have fallen.

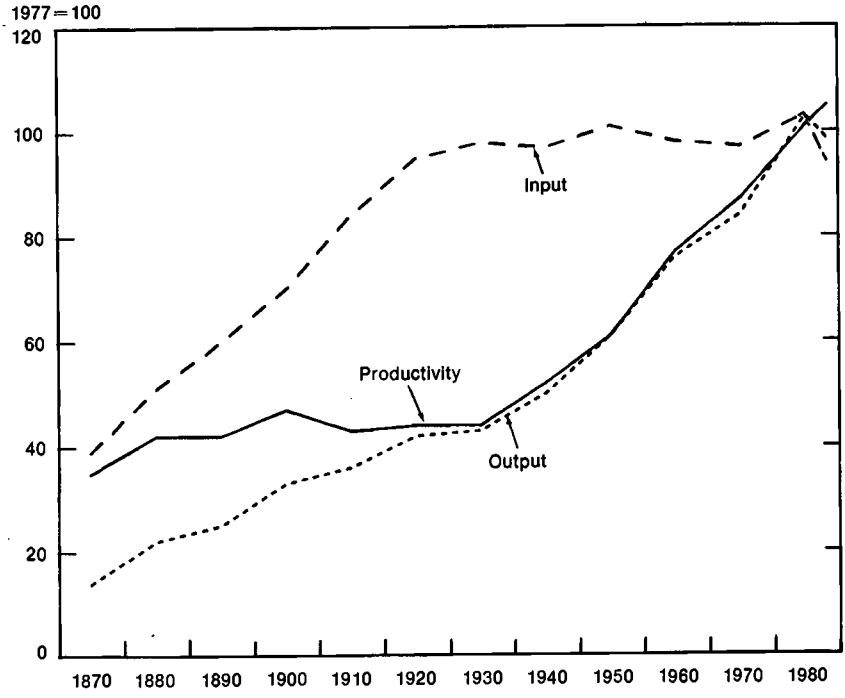
The two largest components of farm cash receipts today are beef cattle and dairy products, making up 21 and 13 percent, respectively, of the total. These are followed by corn and soybeans with 9 percent each, and hogs and wheat with 7 percent each. Cotton, chickens, greenhouse products, eggs, and tobacco each contribute about 3 percent of the total.

DEMAND FOR FARM PRODUCTS

Changes in demand have been an important factor underlying the changes in the product mix of the farm sector. In 1982 the total value of farm marketings was $144.6 billion, with $70.2 billion from livestock production and $74.4 billion from crops. The largest market for crops is domestic human consumption, which absorbed 43 percent of the value of crop sales. The second largest component of

Chart 4-1

Farm Productivity, Output, and Input



Source: Department of Agriculture.

TABLE 4-2.—*Farm input use, 1910–80*

[Index, 1910=100]

Year	Labor	Real estate	Mechanical power and machinery	Agricultural chemicals	Feed and seed
1910	100	100	100	100	100
1920	106	105	159	167	135
1930	102	104	200	200	159
1940	91	106	212	300	229
1950	68	108	424	633	341
1960	45	102	488	1067	453
1970	28	104	506	2500	565
1980	20	101	618	4000	635

Source: Department of Agriculture.

demand is exports (31 percent) followed by livestock feeding (16 percent). The remaining 10 percent goes to industrial use and seed. Within the crop sector there is great variation among these proportions. For example, most fruit and vegetable output goes for human consumption, while virtually all of the tobacco and cotton is for domestic industrial use or exports. Most of the livestock production goes to feed the domestic population, while by-products such as hides and animal fats go to industry or exports.

Domestic Consumption

In 1982 Americans spent $350 billion for food (excluding alcoholic beverages), of which $255 billion was for consumption at home and $95 billion for eating away from home. On the average this represents 16 percent of their disposable personal income, although the poor spend a larger percentage of their income on food than do the more affluent. Of the total retail expenditures for domestically produced food, consumers spent 29 percent for meats, 21 percent for fruits and vegetables, 15 percent for dairy products, 10 percent for bakery products, 7 percent for poultry and eggs, and the remaining 18 percent for miscellaneous food items.

Eighty-five percent of retail food expenditure originates from domestic farm production, and 15 percent is from imported foods. About one-third of our agricultural imports are products that we cannot produce in a temperate climate, in particular, coffee, tea, cocoa, spices, and bananas. Other imported goods that are produced domestically, although perhaps less efficiently, include sugar, dairy products, grass-fed beef, and some fruits, vegetables, edible oils, and beverages. In 1982, agricultural imports totaled $16.9 billion, making the United States the world's third largest agricultural importer, after the European Community (EC) and the U.S.S.R.

Food consumption per capita appears to have reached saturation levels in the United States, with most growth in aggregate consumption now coming from population growth. Total consumption (by weight) per person of foods other than beverages (coffee, tea, and soft drinks) has changed little since 1910. However, there have been major changes in what products are consumed. In the 20th century, direct consumption of grain products has fallen by more than half, while use of fats and oils more than doubled. Consumption of meat, poultry, fish, and sweeteners has risen sharply; consumption of dairy products and eggs first rose and then fell. Nonalcoholic beverage consumption has almost doubled since 1910.

Aggregate food purchases tend to be less sensitive to changes in price and in family income than are purchases of manufactured goods. However, within their food budgets, consumers select from among many choices in food items. Purchases of meats and of miscellaneous foods are quite sensitive to changes in family income, while

consumption of fruits and vegetables and particularly of cereals and bakery products are quite insensitive. Consumption of the more income-sensitive products, such as meats, tends to be more cyclical.

As family income increases, people tend to purchase relatively more services in the food they buy, including eating out more often. The share of the retail food dollar received by the farmer, therefore, has declined to about 28 percent. Labor, packaging, and transport account for much of the additional cost after products leave the farm. As a result, retail prices, particularly of bakery and cereal products, tend to adjust much less than proportionately to changes in farm prices.

Livestock consume about 16 percent of U.S. crop sales. This includes corn and other grains, protein meal, by-products from milling grains, and forage. This understates the feed use of farm output, however. For example, 35–40 percent of corn production is fed to livestock on the same farm where it is produced. The demand for feed is derived from consumers' demand for livestock and poultry products. Forces that alter the demand for meat, in particular income, are reflected in the demand for livestock feeds. Therefore, feed demand tends to have a stronger cyclical response to the level of economic activity than does consumer demand for cereal products.

Livestock feed demand for crop output also tends to be more responsive to price changes than does consumer demand for the final products. An increase in feed prices that turns the profit margin on livestock feeding negative can trigger a substantial slaughter of livestock. In the short run, consumers benefit from cheaper meat at the supermarket. However, to rebuild their herds, farmers must later withhold animals from slaughter for breeding. This rebuilding takes time, during which meat supplies are reduced and retail prices tend to be higher than normal. The use of crops in livestock feeding, then, varies cyclically with herd size. In a sense, the livestock herd functions as a buffer stock of grains. In times of crop shortfall, high grain prices trigger a herd liquidation, thereby freeing up grain for more direct human consumption or exports.

The smallest component of domestic crop demand is industrial uses. Tobacco and fibers, such as cotton and wool, are industrial raw materials. There are also industrial uses of cereals, such as in alcohol and starch production. Many livestock by-products, such as hides and animal fats, are also industrial raw materials. Part of this industrial demand is satisfied by imports, including rubber, wool, and other fibers. Because there are many synthetic substitutes, industrial demand for farm products tends to be quite sensitive to price changes.

Farm Exports

The United States supplies almost 20 percent of world agricultural trade and is the world's largest agricultural exporter. In recent years we have supplied half of the world soybean and product shipments, 55 percent of the coarse grain, 40 to 45 percent of the wheat, 30 percent of the cotton, and 25 percent of the rice that move in world trade.

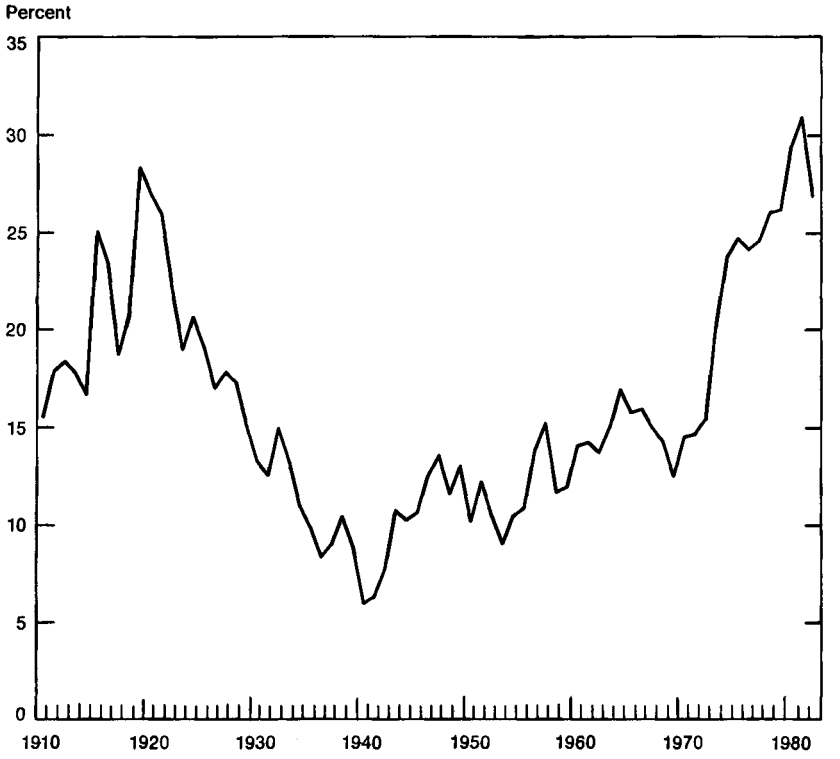
In fiscal 1983 agricultural exports of $34.8 billion represented about one-quarter of U.S. farm sales revenue and the output of about 35 percent of the harvested cropland. Half of U.S. farm exports are for direct food use—wheat, rice, fruits, vegetables, and meats—while more than a third go for feed and other farm uses; the remainder are raw materials used in industrial processes, such as textile, cigarette, and shoe production. In 1983 we exported three-fifths of our wheat, two-fifths of our rice, soybeans, and cotton, one-third of our tobacco, and one-fourth of our corn and sorghum. In contrast, only 2 percent of U.S. meat production and 5 percent of fruit and vegetable output are exported.

During the 1970s the value of U.S. farm exports increased more than five-fold, and the percentage of farm receipts coming from exports increased from less than 15 percent to almost 30 percent. This growth in farm exports represented a major internationalization of American agriculture. Chart 4–2 provides a historical perspective to illustrate that after several decades of reduced importance, U.S. farm exports recovered in 1980 the share they represented in farm marketings 60 years earlier. U.S. farm exports were relatively strong during World War I and its aftermath. As European agriculture recovered after the war, grain exports fell and U.S. agriculture went into depression in 1921. World trade in farm products shrank further as protectionism grew during the 1920s and the Great Depression. U.S. farm exports fell from 22 percent of farm sales revenue in 1922 to 6 percent in 1940. Because U.S. agriculture had a larger export exposure than the manufacturing sector, the collapse of world trade tended to have a relatively greater effect on farm than nonfarm incomes during the Depression.

In the 1920s and 1930s more than half of farm exports were industrial raw materials, mainly cotton, tobacco, hides, and tallow. Since World War II, food, rather than industrial raw materials, has dominated our farm exports. In the 1960s, as economic growth occurred, consumption of livestock products grew in the industrialized countries and in some developing countries. This was reinforced by a major technological change in livestock feeding practices, which dramatically increased demand for feed grains and high protein feeds. The widespread adoption of hybrid seed by U.S. corn growers after

Chart 4-2

Agricultural Exports as Percent of Farm Cash Receipts



Source: Department of Agriculture.

World War II, which substantially increased the profitability and use of fertilizer, greatly expanded corn output and depressed its price. Corn Belt and Mississippi Delta farmers discovered that the soybean, a novelty crop before World War II, did well in their regions. With the postwar productivity growth, production capacity grew faster than domestic consumption, expanding U.S. agriculture's export potential. Corn and soybean products, in particular, became high-growth exports.

During the 1970s the volume of world agricultural trade grew 45 percent, while global farm production grew only 24 percent. In the 1960s and 1970s, world trade in feed grains, soybeans, high protein feeds, and vegetable oils grew fastest. Sugar, food grains, tropical

beverages, and cotton experienced low rates of growth, and meat was intermediate. Trade in other fibers declined.

The pattern of world grain trade shifted dramatically in the past 50 years. The United States substantially increased its share of a rapidly growing market. As Table 4–3 illustrates, as recently as the 1930s Asia, the U.S.S.R., Eastern Europe, North Africa, and the Middle East were net exporters of grains. All have become significant net importers. From the mid-1950s to the late 1970s, world grain trade grew from about 30 million to 130 million tons per year. The largest increase in exports was from North America.

TABLE 4–3.—*World net imports and exports of grain, selected periods, 1934–83*

[Millions of metric tons: annual averages]

Country	Net imports (−) or net exports					
	1934–38	1948–52	1960–62 [1]	1969–71 [1]	1979–81 [1]	1982–83 [1]
Developed countries:						
United States	0.5	14.0	32.8	39.8	106.4	99.0
Canada	4.8	6.6	9.7	14.8	18.6	25.8
South Africa	.3	.0	2.1	2.5	6.2	.5
Oceania	2.8	3.7	6.6	10.6	14.2	12.0
Western Europe	−23.8	−22.6	−25.6	−21.4	−11.1	−4.5
Japan	−1.9	−2.3	−5.3	−14.4	−23.2	−23.7
Centrally planned countries:						
U.S.S.R. and Eastern Europe	4.7	2.7	.5	−3.6	−39.3	−44.6
China	−1.0	−.4	−3.6	−3.1	−11.4	−14.7
Developing countries:						
Latin America	9.0	2.1	1.5	5.3	−5.3	.2
North Africa and Middle East	1.0	−.1	−4.6	−9.2	−23.3	−27.8
Asia	2.4	−3.3	−5.6	−11.0	−13.4	−14.1

[1] Marketing years.

Note: Grain includes wheat, milled rice, corn, rye, barley, oats, sorghum, and millet.

Source: Department of Agriculture.

The growth in world cereals imports in the last decade has been fueled mainly by growth in per capita income, with growth in population being a significant but less important factor. The growth in imports occurred mainly in the centrally planned economies, the middle-income developing countries, Japan, and the oil-exporting countries. The U.S.S.R. and Eastern Europe alone accounted for 40 percent of the increase. These, like Japan and the middle-income developing countries, experienced rapid growth in incomes and in meat consumption but they lacked a comparative advantage to increase feed production. This effect is reinforced in the centrally planned economies by their policy of subsidizing food so that consumers pay less than the world price for meat and other livestock products. A small fraction of the growth in grain trade over the last decade has gone to meet food needs of low-income countries. These economies do not have the foreign exchange to pay for cereals imports, and their food aid imports have risen.

Since the global recession began in 1981, growth in world trade has slowed. This, together with record world production and third world debt problems, has reduced the volume of agricultural trade. The appreciation of the dollar has raised the cost of U.S. exports relative to other suppliers. Federal agricultural policies have also driven up the price of U.S. exports. This and the strength of the dollar contributed to a fall in the U.S. market share in world agricultural trade as well as the value of its exports.

The growth of exports in the last decade has radically changed the structure of demand for U.S. farm output. From World War II until about 1973, when exports were relatively unimportant, overall demand was quite insensitive to price. However, because there are other exporters and because most countries import farm products only after consuming their own domestic production, export demand tends to be more responsive to price and income changes. This means, for example, that when supply grows faster than demand, the market price may fall less than proportionately, and total farm revenue may increase.

Growth in exports has also introduced greater instability in the markets for American farm products. Exports are affected by weather, trade policy, exchange rates, population, and income in the rest of the world. All but population tend to be unpredictable and, therefore, generate shocks to the U.S. farm sector through the variability they cause in export demand.

In the 19th century, a country's competitive position in agriculture was strongly influenced by its endowment of fertile land and favorable climatic conditions. Today our fertile, abundantly rain-fed land base, while still important, accounts for only part of the competitiveness of U.S. agriculture. Other countries less well endowed with fertile land have followed the U.S. pattern of agricultural development by shifting to a more capital-intensive, science-based agriculture. A relative scarcity of land is no longer as severe a constraint on agricultural growth as formerly. If U.S. agriculture is going to maintain its competitive position, productivity growth must be sustained.

THE BROADER ECONOMIC ENVIRONMENT

American farmers responded strongly to the agricultural export boom of the mid-1970s. They substantially expanded their capacity by bringing previously retired land back into production and by buying more and larger machinery and equipment. The price of land was bid up to unprecedented levels. The boom attracted new entrants and encouraged many farmers to mortgage their present farms to buy more land. When the global recession hit in 1981 and the

dollar appreciated substantially in foreign exchange markets, U.S. farm exports and, in turn, prices and incomes, fell. This left U.S. agriculture with excess capacity relative to current demand. Many recent entrants and farmers who expanded in the 1970s suffered severe cash flow problems. These farmers have experienced capital losses as land prices have declined from their 1981 peak.

INTERNATIONAL TRADING ENVIRONMENT

The current world trading environment is characterized by weak demand and keen export competition. In the early 1980s the global recession, third world debt, and the strong U.S. dollar have reduced export demand.

Farm exports are not expected to grow as fast in the 1980s as they did in the 1970s. A decline in the value of the dollar would help all export sectors. However, in the past decade other major exporters have made large capital investments in agriculture and in marketing facilities to expand export capacity. They can be expected to compete aggressively for our share of the growth in world farm trade even when the dollar returns to a lower exchange rate.

Japan, Europe, and the U.S.S.R. are expected to continue to be large importers of U.S. agricultural products, although further growth is likely to be slow. The EC will probably continue to be a protectionist, slow-growth market even for those farm products that it imports. Eastern Europe, which was a rapid growth market in the 1970s, is experiencing such severe foreign debt problems that the outlook for rapid expansion in imports of farm products in the next few years is not bright.

The newly industrializing countries, particularly of East Asia, also expanded their imports rapidly in the 1970s. Resumption of this growth will depend upon their ability to generate foreign exchange earnings from exports. This will depend in part on the trade barriers erected against their exports by the developed countries. While the low-income countries are likely to need significant amounts of agricultural imports to feed their rapidly growing populations, their limited foreign exchange earnings will severely constrain their effective demand in the world market.

U.S. agriculture has a large interest in economic development of the low-income countries and in growth in world trade. Until the debt problems and foreign exchange earnings of Eastern Europe and the low- and middle-income developing countries improve significantly, the prospects for much growth in farm product imports by these countries are limited.

Competition is keen among exporters for the available markets in the current situation of depressed world farm trade. This has been

reinforced by the increases in agricultural protectionism and in predatory export practices. In particular, the U.S. Government has protested to the EC that its use of agricultural export subsidies to erode U.S. markets is a form of unfair competition. The internal price supports generally exceed world market prices by a substantial margin, yet the EC has chosen not to build up large stocks of grains. Instead the EC subsidizes farm exports in order to sell the surplus on the world market. Unlike the United States, the EC has not until recently required acreage or marketing reductions for farmers to qualify for price supports. The EC recognizes the problems with its agricultural policy, which now absorbs two-thirds of the total EC budget and imposes substantial additional costs on its consumers. The EC, like the United States, now has excess capacity induced in part by high price supports and is exploring means of reforming its farm policy to reduce the cost to taxpayers. It is unclear how the necessary adjustment will occur in the EC, but the United States has emphasized that other countries cannot be expected to bear the major burden of European adjustments.

MACROECONOMIC ENVIRONMENT

Modern American agriculture's relative capital intensity, reliance on purchased intermediate inputs, and export earnings integrate it tightly into the rest of the U.S. economy. Cyclical changes in the level of economic activity now have larger effects on agriculture than formerly. The agricultural sector, like other trading sectors of the U.S. economy, is strongly affected by interest rates and the value of the dollar. The agricultural sector therefore has a strong interest in reducing the Federal deficit to which recent farm programs have contributed significantly. Macroeconomic policy may have as great an absolute effect on agriculture today as do the direct effects of farm policy.

Prices of agricultural commodities tend to adjust to changes in the rate of money growth more quickly than do many other prices. This is true in part because contracts for raw materials tend to be written for shorter durations than for other goods and services. In addition, because of biological lags, agricultural supply tends to be very unresponsive to price changes in the short run. There are large differences among commodities in the degree to which demand responds to changes in consumer incomes. While demand for farm products tends to be less responsive than demand for many other goods, there nevertheless is a positive response to income changes. Therefore, agricultural prices tend to increase relative to other prices during the early phase of a monetary expansion and fall in relative terms at the start of periods of monetary stringency.

Because contemporary agricultural production requires a larger capital investment and uses more purchased inputs, a modern farmer's requirements for both mortgage credit and short-term operating credit are larger than in recent decades. Interest rates, therefore, have a greater effect on the cash operating costs of the modern farmer. Moreover, because one could earn interest on the capital invested in commodity inventories, the expected increase in agricultural commodity prices during the year must be at least as large as the forgone interest earnings if inventories are to be held.

Although the increasing overvaluation of the dollar impeded farm exports in the 1960s, depreciation of the dollar in the 1970s encouraged larger exports. The move from fixed to floating exchange rates, however, subjected all traded goods sectors to a new source of short-run instability. Because the present strong dollar has made imports cheaper to Americans and U.S. exports more expensive to foreigners, all traded goods sectors, including agriculture, have suffered reductions in demand and lower incomes. Agriculture, which earns around 25 percent of its gross revenue from exports, has a larger export exposure than most sectors of the American economy. Therefore it has been buffeted relatively more by the shifts in export demand that have accompanied the floating dollar over the last decade.

FEDERAL POLICIES AFFECTING AGRICULTURE

The development of U.S. agriculture and the well-being of American farmers have been strongly influenced by Federal policies since the Civil War, but particularly since 1933. During the Civil War a number of policy measures were taken to stimulate farm production. This helped satisfy the growing export market for grains. When the export market shrank in the 1920s and 1930s, farm prices and land values fell; bankruptcies became common. Several measures were taken in 1933 to support farm prices and incomes and save farmers from bankruptcy. When these, together with rapid technological change, caused production to grow faster than demand, another set of policies was implemented to expand demand. All three types of policies exist today in forms not greatly different from their original structure, despite the fact that conditions have changed markedly in the past 50 years.

POLICIES THAT REDUCE PRODUCTION COSTS

In the 19th century the construction of canals and later the transcontinental railroad opened up the fertile interior of the country to urban markets in the United States and Europe. Subsidized loans from the Rural Electrification Administration in the 20th century

helped extend electric and telephone service to remote rural areas at low cost. Because farm production is so geographically dispersed, these policies not only stimulated its expansion, but also lowered its cost. Federal regulation of transport and communication until recently kept rates to remote rural communities at or below cost. The implicit subsidies paid by high-density routes in other parts of the country, however, have been reduced recently by deregulation.

The Homestead Act, passed in 1862, provided a means of distributing public land in the unsettled regions of the Midwest and Great Plains free to settlers who would cultivate it for 5 years. The Morrill Act, also passed in 1862, established a land-grant college of agricultural and mechanic arts in every State. At first these were teaching institutions, but they later took on important agricultural research and extension roles as well. The Hatch Act of 1887 provided annual Federal support for agricultural research in each State, and the Smith-Lever Act of 1914 created the cooperative agricultural extension service. This land-grant system has developed and diffused higher productivity technologies adapted to the conditions of each State.

Research Policy

Since passage of the Hatch Act, a substantial portion of the cost of agricultural research in the United States has been directly borne by the Federal Government, especially in the biological area. The private sector has developed more of the mechanical and chemical technologies. Government support for agricultural research was appropriate because it was difficult to protect biological research results, such as wheat breeding. A private firm carrying on such research would not be able to control the dissemination of the results to capture enough of the payoff to recoup its investment costs. The research results have been an important source of growth in agricultural production and exports. The annual rate of return to taxpayers from investing in agricultural research has been about 50 percent.

Farm Credit and Crop Insurance

Historically, the rural banking system was weakly integrated into the national financial markets. Between 1916 and 1933, an independent, federally funded farm credit system was established. Although now autonomous from the Federal Government, the close association of the system to the Federal Government means that it can borrow from the national financial markets at close to the same rate as the Federal Government. Because the Federal rate is always less than the prime rate, this provides to farmers an interest rate advantage over what they could get at commercial banks. The system, which is cooperatively owned by its member borrowers, holds about one-third of

all credit outstanding to farmers. The Commodity Credit Corporation of the Department of Agriculture also provides shorter-term credit at favorable interest rates to farmers who participate in price support programs.

The lending activities of the Farmers Home Administration, another agency of the Department of Agriculture, tend to involve a greater subsidy element and to incur a larger Federal budget cost. The Farmers Home Administration makes real estate loans and other loans to farm borrowers who cannot obtain credit from commercial sources. The borrowers are mainly new entrants, small farmers, and farmers who have lost their creditworthiness. Loans to these borrowers often result in higher risks and therefore larger losses than would be acceptable to private lenders.

The Farmers Home Administration also has made emergency loans at well under market interest rates in areas hit by natural disasters. This program has been criticized for making subsidized credit available to farmers who already had access to credit from commercial sources. Despite very generous repayment terms, this program has not been noted for restoring financially troubled farms to profitability. During the 1970s the government also made direct payments to farmers who suffered financial losses due to natural disasters. By shifting part of the risk of failure to the Federal Government, these programs have encouraged larger crop production in areas of the country where the risk of crop failure is greatest.

The direct disaster payment program is being phased out as a result of the 1981 farm bill. It is being replaced by Farmers Home Administration lending and by a new and expanded Federal Crop Insurance program. Participation rates in the former crop insurance program were low, in part because the premiums did not adequately reflect individual differences in risk or in individual farmers' resources and management skills. The program was redesigned to encourage more commercial producers to participate than under the previous program, and the government now subsidizes up to 30 percent of the cost of crop insurance to farmers.

Together, emergency loans, disaster relief, and subsidized crop insurance tend to induce excessive crop production in areas of the country that are subject to a wide range of weather-related yield variation. The programs do this by raising farmers' expected returns from crop production in such areas by shifting part of the risk of failure to the Federal Government.

Income Tax Policy

Several features of the income tax law, some of them unique to farming, may encourage greater investment in productive capacity and expanded production. First, most farms use cash accounting

rather than accrual accounting. Farmers enjoy some flexibility in reducing taxable income by paying for purchased materials in high revenue years and by delaying sales into years of lower revenue. Second, under current tax laws, depreciation schedules for many capital assets are considerably shorter than the economic life of the assets. Reducing near-term taxable income in effect gives the farmer interest-free funds during part of the productive life of an asset. Third, use of the investment tax credit lowers the effective cost of capital items. Finally, sales of breeding animals and dairy cattle held longer than 1 year are treated as capital gains rather than ordinary income. This can substantially reduce the tax on such receipts for higher-income taxpayers, especially those with high off-farm income.

Tax policy does not affect the profitability of all types of farms equally. The tax laws encourage the substitution of capital for labor. Larger farms, which generate higher incomes, appear to gain proportionately greater benefits than smaller farms. People in higher marginal tax brackets can benefit more from the tax provisions. This creates an incentive for higher-income people to invest in farming. In practice, losses from farm operations reduce taxes on other income by more than the total Federal tax revenue from farm profits, implying that total farm income for tax purposes is negative.

Input Subsidies

Some Federal policies raise agricultural output by stimulating the uneconomic use of certain inputs. For example, the government often sets the price of water artificially low by granting public subsidies to construct and maintain irrigation projects. These low prices give farmers an incentive to use water in arid regions on crops that require a great deal of water. If the price of water were set higher, farmers would tend to grow less water-intensive products, leaving production of crops that use more water to humid regions. Without these public subsidies, some products now produced in arid regions could not compete with the same goods from more humid regions of the country.

There are other input subsidies for U.S. agriculture. For example, in the name of conservation, the government has shared the cost of terracing and contouring the land, applying lime, and otherwise improving the soil. The United States' relatively low energy prices have also encouraged mechanization and energy-intensive practices, such as irrigation and grain drying.

Farm Labor Policy

Farm labor policy mainly affects the labor-intensive agricultural activities, principally fruit, vegetable, and sugar production. The extension of minimum wage legislation to agricultural labor in 1966 pro-

vided an incentive for farmers to accelerate the pace of mechanization. Only about 1 percent of farm workers belong to labor unions, which formed in the farm sector in the 1960s, compared with 20 percent of all American workers.

The farm labor market has been greatly affected by the entrance of foreign workers into the United States. Until 1965, about 100,000 workers per year, mostly from Mexico, were authorized to enter temporarily under the Bracero program. Since the passage of the Immigrant Nationality Act in 1952, migrant workers have been given temporary immigrant status, under Section H2, if they do not compete with American workers. In recent years, Section H2 has covered only about 20,000 workers, mostly for sugar and apple harvesting.

PRICE AND INCOME SUPPORT POLICIES

The policies of the 19th century increased supply and helped the farm sector satisfy the growing domestic and export demand. The drop in export demand in the 1920s sent the farm sector into depression, and the effect was reinforced in the 1930s when protectionism increased and demand fell further. Farm prices and cash flow fell so low that many farmers could not make their loan payments; foreclosures became widespread. The Federal Government then turned to policies to support farm prices and to restrict the supply of agricultural products.

Origins of Price Supports

Although the depression in agriculture continued through the 1920s, it was viewed as a transitory problem resulting from excess capacity relative to demand. The Congress appropriated $500 million for the Federal Farm Board, created in 1929, to purchase cotton and wheat in order to bid up prices and thereby increase farm incomes. The Board was expected to resell these products when the market strengthened. The Board exhausted its capital stock in 3 years with no perceptible effect on prices.

After the Board's failure to support farm prices, the Agricultural Adjustment Act of 1933 created the Commodity Credit Corporation (CCC). The CCC was permitted to borrow funds directly from the U.S. Treasury to carry out its price support programs. These programs were viewed as a temporary expedient when they were initiated in 1933, but our present price support instruments are remarkably similar to those put in place 50 years ago.

The CCC employs two measures for supporting farm prices—direct commodity purchases and nonrecourse loans. Under the former, the CCC stands ready to acquire any quantity of a supported commodity offered in the market at a guaranteed minimum price, the support price. This technique is still used today to support the price

of milk. (Because of the perishability of fluid milk, the CCC supports its price by purchasing butter, cheese, and nonfat dry milk.) By authority of Section 32 of the Agricultural Adjustment Act of 1933, as amended in 1935, the Agricultural Marketing Service, an agency of the Department of Agriculture, purchases commodities whose prices are depressed. Chicken, pork, fruits, and vegetables are periodically purchased, although no formal support price is involved.

The CCC's other instrument is the nonrecourse loan. Under this program the CCC offers loans to farmers with their crops pledged as collateral. The size of the loan equals the support price (the "loan rate") times the quantity of the farmer's crop put under loan. Most loans are made for less than 1 year. If the market price rises sufficiently during the period of the loan, the farmer may pay off the loan plus interest and reacquire control of his crop. If the market price is not sufficiently above the loan rate when the loan comes due, the farmer can then freely default. The CCC accepts the commodity as payment in full and cancels the loan and interest. Loan rates were originally established to support the prices of wheat, corn and cotton. Rice, peanuts, and tobacco were soon added to the program.

In principle, both types of price support operations can be viewed as involving buffer stocks. A price support puts a floor under the market price in periods of slack demand, thereby protecting farmers' incomes. If the market price rises to a sufficiently high level, the CCC can sell the commodity back into the market at a profit, helping thereby to defray its cost of operation. It has to pay interest to the U.S. Treasury on its operating capital. A buffer stock is designed to protect farmers against abnormally low prices and consumers against unusually high prices. In practice, however, the support prices and loan rates have often been set above the long-run market-clearing level taking into account both domestic and international demand.

Although the loan rate has often been set above the market-clearing price for some commodities, farmers often argue that government stocks "hang over the market" and depress the price. They therefore lobby to ensure that government stocks are released in a manner that does not depress the price.

Rise of Restrictions on Input Use and Marketing

As government stocks of commodities accumulated under price support operations, it quickly became apparent that the programs were treating a symptom, not the root, of the problem—the excess capacity of the farm sector relative to market size at current prices. Three approaches have been used to address that—acreage allotments, marketing restrictions, and voluntary land retirement.

Acreage allotments are quantitative restrictions on the acreage a farmer may plant to a given crop. Although these have been used on

wheat, rice, cotton, tobacco, and peanuts, only the last two remain in effect. In practice, farmers tend to retire their least productive land first. They also raise crop yields on the acreage planted by using more fertilizer and other inputs per acre. Production, therefore, falls by proportionately much less than the reduction in land area. Marketing quotas have also been imposed, at times in conjunction with acreage allotments, such as with tobacco. Quotas based on historical sales freeze the structure of the industry. Later entrants are forced to buy or lease marketing rights from present quota holders.

While marketing restrictions were authorized in the Agricultural Adjustment Act of 1933, another variant was authorized when the act was amended in 1935. This 1935 act authorized the creation of marketing orders to regulate the sale of milk and various fruits, vegetables, and specialty crops. Once an order is approved by two-thirds of all producers, all regulated processors or handlers must comply with the regulations. While some marketing orders are only concerned with grading and packaging standards, or collective support for research or advertising, others regulate the flow of products to market and enforce price discrimination.

Allotments cause all producers to cut back jointly on marketing, just as if they had formed a cartel with the government agreeing to police the members. Examples include the marketing orders for brewers hops and spearmint oil. These are now being phased out.

Other marketing orders permit price discrimination among markets with different demand characteristics. A higher price is charged in markets for certain fresh fruits and fluid milk, where demand is less responsive to price, and a lower price is charged for identical fruit used in canning or for milk that goes into butter, cheese, or other manufactured dairy products. This raises producers' total revenue at the expense of consumers. There is nothing unique about the commodities regulated by such marketing orders that requires volume-control on sales of fresh produce. For example, sales of California and Arizona oranges and lemons, tart cherries and walnuts are controlled, while Florida citrus, sweet cherries and pecans are not.

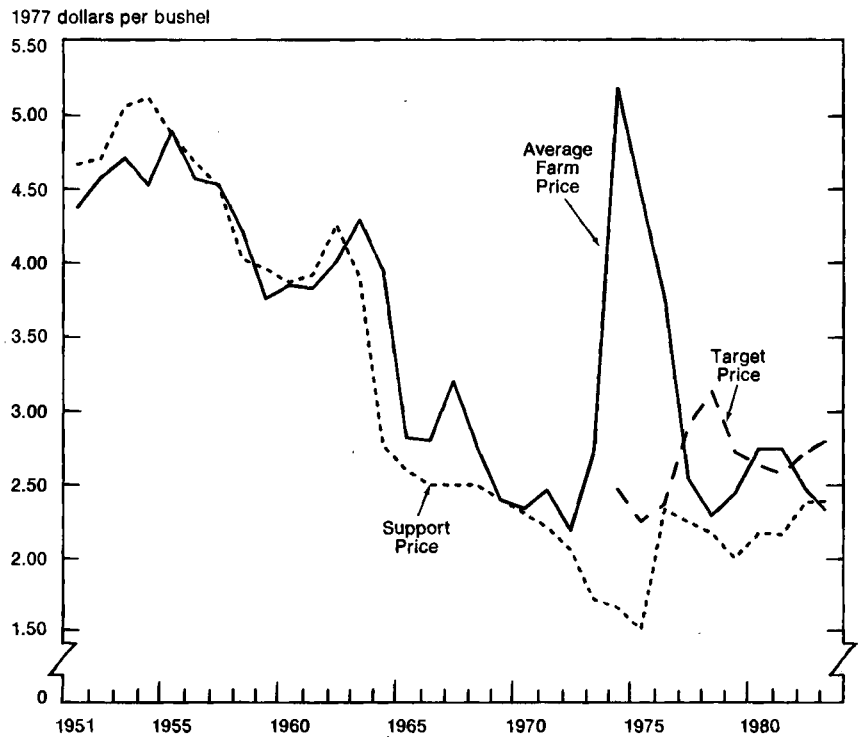
While World War II and the Korean war provided a period of high prices for U.S. agriculture, the lower farm prices and incomes which followed brought renewed attempts to restrict acreage or marketings. A voluntary land retirement program known as the Soil Bank was established in 1956, in which the government paid farmers to take land out of production. By the late 1960s, farmers had retired more than 60 million acres under this program.

Nevertheless, with rapid productivity increases, surpluses continued to mount despite the downward drift of real support prices through the 1960s. Chart 4-3 illustrates this trend for wheat. The in-

creasing overvaluation of the dollar in the late 1960s made this price reduction less pronounced when viewed from the perspective of importing countries. Despite their downward drift, the support prices appear to have exceeded market-clearing levels in most years through 1972, when the dollar was devalued and farm exports and prices increased dramatically. The effect of the dollar devaluation was reinforced by simultaneous crop failures in many parts of the world, the ready availability of credit, and a change in Soviet agricultural import policy that led to a large grain purchase from the United States.

Chart 4-3

Real Wheat Prices



Source: Department of Agriculture.

The Last Decade

As farm exports expanded, government programs were adjusted to allow farmers to bring most of the retired land back into production. In 1973 farm incomes exceeded those in the rest of the economy for

the only time in history. The excess capacity of the 1950s and 1960s disappeared, and farmers quickly expanded their production capacity to satisfy the export demand.

The moves toward an increasingly market-oriented farm policy, begun in the late 1960s, culminated in the Agriculture and Consumer Protection Act of 1973. Recognizing that loan rates, by interfering with market prices, may limit our ability to compete in world markets, the 1973 act attempted to divorce the policy objective of farm income support from price supports. The act retained loan rates as a form of minimum price insurance, but established a system of target prices and deficiency payments to provide farm income insurance. Participating farmers can make production decisions based on the target price, but unlike loan rates, the entire crop is sold on the market for whatever it will bring. The difference between the target price and the average market price (or the loan rate, whichever is higher) in the first 5 months of the marketing year is paid to the farmer in the form of a deficiency payment per unit of production. By this means, the government avoids accumulating stocks unless the market price falls to the loan rate.

One disadvantage of target prices and deficiency payments is their large potential cost to the government, particularly if there is a wide spread between the target price and loan rate. To overcome the cost disadvantage and the tendency for target prices to encourage larger production, the program often requires a farmer to reduce the acreage planted as a condition for participating in the benefits of the program. The forgone production on this acreage is, in effect, the premium paid for the price insurance provided by the loan rate and the income insurance provided by the target price.

Because market prices were high during the export boom of the mid-1970s, the then-existing farm policies had little effect. Concern arose, however, about the much larger price instability that had accompanied the export growth in the absence of government stocks. A 3-year CCC loan program, known as the Farmer Owned Reserve, was established by the Food and Agriculture Act of 1977. In exchange for a higher loan rate, a farmer who satisfies any acreage reduction requirements can place commodities in the Farmer Owned Reserve for a 3-year period. After the first year, the loan is interest free. The Department of Agriculture pays for the storage cost for all years of the loan. In exchange, the farmer agrees not to sell the grain until the market price rises to a specified release price.

Although the Farmer Owned Reserve was designed as a buffer stock scheme for stabilizing market prices, in practice the price bands have been altered frequently. In particular, since the 1980 embargo of grain sales to the U.S.S.R., the Farmer Owned Reserve loan rate

has at times been set high enough to provide incentives to produce for storage under the program. This is contrary to its objective of providing price insurance when the market price falls below its long-run equilibrium level.

With the onset of the global recession and the strengthening of the dollar 2 years ago, farm exports fell and farm prices dropped well below loan rates. There were bumper crops in 1981 and 1982, and stocks in the Farmer Owned Reserve and in CCC inventories burgeoned. With no imminent increase in exports foreseen, a Federal policy decision was made early in 1983 to offer farmers payment-in-kind if they would reduce their crop acreage in 1983. Farmers found this proposition so lucrative that they cut back their harvested acreage by 55 million acres from the previous year. In addition, a devastating drought struck, drastically reducing production of corn, soybean, and cotton in particular. The payment-in-kind program is not viewed as a permanent addition to the instruments of Federal farm policy.

POLICIES THAT AUGMENT DEMAND

Farm production has grown more rapidly than demand during most of the past 50 years, exerting downward pressure on farm prices. Several Federal policies have attempted to increase domestic and foreign demand in order to provide some price support to farmers.

Consumer Policies

A number of Federal programs directly related to food have sought to aid low-income consumers, who spend a larger fraction of their income on food. When the government began purchasing agricultural commodities to support farm prices and farm income in the 1930s, certain commodities were distributed free to the urban poor and unemployed. Direct distribution of surplus commodities acquired by the CCC continues to this day, for example, the recent distribution of surplus cheese and other CCC-owned products. In addition, the government subsidizes school lunches and donates commodities to schools. These include meats, fruits, vegetables, eggs, and poultry.

The largest program is the food stamp program, which had a budget cost in fiscal 1983 of $11.2 billion. This program distributes food stamps to low-income consumers to augment their purchasing power in a form that must be spent specifically on food. Nevertheless, because food stamps substitute for cash within a household budget, low-income consumers tend to spend only about 12 cents more on food for each dollar's worth of food stamps received. The food stamp program probably added less than 1 percent to aggregate consumer expenditures on food in 1983. This program is mainly a

welfare program for low-income consumers rather than a program to expand food demand.

Agricultural Trade Policy

A country's agricultural trade policy is generally a consequence of its domestic price support programs. Major changes in a country's trade policy, therefore, generally require changes in that country's domestic agricultural policy as well.

When price supports are set above the world market-clearing level, they have particularly adverse side effects for internationally traded commodities. Unless trade is constrained, a large trading country like the United States cannot support the domestic price of a commodity without also supporting its price for farmers in all other trading countries. When the support price exceeds the world market price on export products, the U.S. Government withdraws enough supplies from the market to raise the world price to the domestic support level. Exports fall, raising the world price for the commodity. This higher price encourages farmers in other countries to expand their production capacity. This has occurred for tobacco, cotton, and wheat—at various times among our most important export crops.

To support the domestic price of goods that we import, the government must buy up domestic production and even imported supplies until the world market price is bid up to the support level. This appears to be happening today under the price support program for honey, although this is not typical. Instead, by authority of Section 22 of the Agricultural Adjustment Act of 1933, as amended in 1935, quotas or fees can be imposed on imports of any product whose domestic program is threatened by imports because of price supports set above the market-clearing level. The United States currently has such import quotas on sugar, dairy products, cotton, and peanuts. The United States received a waiver for these quotas in the 1950s by the General Agreement on Tariffs and Trade.

Although there is no price support program for beef, the Meat Import Act of 1979 mandates annual quotas to limit imports when domestic supplies are large. Voluntary export restraints have been negotiated with the principal beef exporting countries to avoid triggering the beef import quota.

In 1954, Public Law 480 created the Food for Peace program as a means of reducing the large CCC stocks acquired through price support purchases. This act and subsequent amendments provided for donations of commodities to poor countries and sales for local currencies. These funds are used for development projects or local expenses of the U.S. Government, such as embassy operation. Almost 40 percent of all U.S. grain exports in the 1960s were under Public Law 480. While concessional sales have helped to reduce burden-

some government inventories and to develop new markets for U.S. farm products, the years when government stocks have been largest have often failed to coincide with years of crop shortfalls in developing countries.

Government stocks also have been reduced through export subsidies. Export subsidies on agricultural products are permitted under the General Agreement on Tariffs and Trade, subject to certain conditions. In particular, export subsidies must not be used to obtain more than an "equitable" share of world exports or to "materially undercut" other suppliers' prices. Export subsidies were used by the United States to avoid accumulating larger CCC stocks from the 1960s until 1972. In recent years, "blended credit" and special subsidized sales have been used to encourage other countries, particularly the EC, to reduce their farm export subsidies. "Blended credit" consists of a mixture of no-interest loans "blended" with guaranteed or nonguaranteed commercial credit.

Export subsidies set up a two-price system that permits producers collectively to charge a higher price in the domestic market, where demand is less price responsive, and a lower price in the export market, where demand is more sensitive to price changes. By this means, total revenue to producers is increased. Total revenue to producers is, of course, further enhanced by the fact that farmers receive the higher domestic price for all they sell, but taxpayers pay the entire cost of the export subsidy.

The target price system can also act as an export subsidy under certain circumstances. Unless sufficient acreage reduction is required, target prices tend to cause larger production and lower market prices than would otherwise occur. Such price reductions have the same effect, when viewed from other countries' perspective, as export subsidies, unless loan rates are set at or above the long-run world market-clearing prices. For example, it appears that the wheat loan rates were sufficiently low in 1977, 1978, and 1979, that the target prices did depress market prices. Since 1980, however, the wheat loan rates have been set at such high levels that exports have been reduced.

The United States generally endorses free trade. During the various rounds of multilateral trade negotiations, the United States has regularly urged that trade in agricultural commodities be treated simultaneously with other goods, only to see it split off for separate treatment. The various rounds of trade negotiations have significantly lowered tariffs but have been relatively unsuccessful at achieving similar reductions in nontariff barriers, the principal barriers to trade in agricultural commodities.

On several occasions in the 1970s, the U.S. Government embargoed exports of certain agricultural products—either globally or to selected destinations. Exports of soybeans, for example, were embargoed in 1973 to hold down domestic prices to livestock producers who use soybean meal as an input, and indirectly to protect domestic consumers from higher prices of livestock products. In 1980 a partial embargo was imposed on grain sales to the U.S.S.R. in response to the invasion of Afghanistan. As a result of these embargoes, questions have been raised about the reliability of the United States as a supplier and about the sanctity of U.S. export contracts. This Administration has publicly stated that farm exports will not be selectively embargoed in the future, and has entered into long-term sales agreements with China and the U.S.S.R.

Since 1981 the adverse trade effects of the strong dollar, third world debt problems, and high price supports have motivated legislative requests for special export assistance through price or credit subsidies and expanded export credit guarantees. Credit guarantees have become a major tool in the effort to maintain U.S. farm exports. In addition, public expenditures in support of U.S. agricultural export promotion and foreign market development activities have increased.

NET EFFECTS OF FARM PROGRAMS

Table 4–4 lists the major Federal farm programs for the most important American farm products. In fiscal 1983 the Federal price and income support programs cost the taxpayer more than $28 billion, but this number tells only part of the story. Price supports and restrictive marketing and import practices impose an additional cost on consumers by reducing their purchasing power.

Federal farm policies tend to have two opposing effects on consumer prices. Public support for agricultural research and development has produced a stream of productivity-increasing, cost-reducing technological improvements, which have lowered market prices. Food price reductions benefit the poor in particular, because they spend a larger fraction of their income on food than do middle- and upper-income groups.

Offsetting this positive effect on consumer prices are public policies that artificially raise farm product prices above the market-clearing level through price supports and restrictive marketing and trade practices. By raising food prices, these policies tend to reduce consumers' purchasing power. Because the policies alter relative prices, they also distort the mix of products consumed. They have stimulated the development of synthetic substitutes for natural products, for example, high-fructose corn sweeteners and low-calorie sweeteners

TABLE 4-4.—*Major Federal farm programs by commodity, 1982*

Sales rank	Commodity	Billions of dollars		Nature of program
		Farm sales value	Value of net exports	
1	Beef cattle and calves	29.9	−1.2	Import restrictions.
2	Dairy	18.4	−.3	Price supports. Import quotas. Classified pricing.
3	Feed grains	16.1	6.4	Price supports. Deficiency payments. Acreage restrictions. Storage incentives for participants.
4	Soybeans	12.4	6.2	No effective program (price supports).
5	Hogs	10.6	−.5	Section 32 purchases.
6	Wheat	9.8	6.9	Price supports. Deficiency payments. Acreage restrictions. Storage incentives for participants.
7	Poultry and eggs	9.5	.4	Section 32 purchases.
8	Vegetables	8.1	.0	Some products free market, but some import restrictions and marketing orders. Section 32 purchases.
9	Fruits and tree nuts	6.7	.1	Some products free market, but some import restrictions and many marketing orders. Section 32 purchases.
10	Cotton	4.9	2.0	Price supports. Deficiency payments. Acreage restrictions. Import quotas.
11	Tobacco	3.3	1.2	Price supports. Acreage and marketing controls.
12	Hay	2.1	.0	No program.
13	Rice	1.7	1.0	Price supports. Deficiency payments. Acreage restrictions.
14	Sugar beets and cane	1.7	−.8	Price supports. Import quotas, fees, and duties.
15	Peanuts	.8	.2	Price supports. Acreage restrictions. Import quotas. Domestic marketing quotas.

Sources: Department of Agriculture and Council of Economic Advisers.

for sugar, synthetic fibers for cotton and wool, margarine for butter, nondairy creamers for cream, and artificial cheese for natural cheese on frozen pizzas. Such substitutions have offset part of the adverse effects of price-enhancing policies on consumer welfare. Finally, low-income consumers have realized some benefits through income-augmenting programs such as food stamps and commodity distribution.

Public policies also affect the farm sector's export performance. Past public investments in agricultural research account for part of the increase in farm exports. At least in the long run, export demand is elastic, so this export growth has increased agricultural export revenue. On the other hand, policies that administratively set U.S. farm support prices above the world market-clearing level tend to reduce

export revenue in the long run. This occurred in the 1960s and again for some commodities in the early 1980s. Such policies prevent agriculture from realizing its full potential as a trading sector.

What matters to producers is how government policy affects the net returns to their land, labor, and capital. For a given technology, any public policy that raises the price of products or lowers the cost of purchased goods and services raises net returns. This has been the effect of price supports, import quotas, and export subsidies, as well as of cheap water and cheap energy policies. On the other hand, the price supports on grains have raised the price of feed to the livestock and poultry sectors. In this way, public policy raises the net returns to one set of farmers, while lowering those to another.

Different rates of protection to different sectors tend to cause inefficient resource allocation. Resources tend to move to where they earn the highest returns. If public policy artificially raises the returns in one sector relative to another, this will attract excessive investment and result in excess capacity. Inefficient resource allocation lowers the potential production of the economy as a whole and reduces per capita income. When public policy diverts, say, investment capital or water from more to less productive uses, this lowers national income.

While farming has changed a great deal since the 1930s, farm policy instruments have not been adapted to the changing structure of farming and the environment in which it operates. Average sales of commercial farmers have grown rapidly, and the benefits from farm programs tend to be concentrated on the largest producers, despite payment limitations for some programs. Moreover, the benefits from the programs have tended to become capitalized into land values, thereby increasing landowners' wealth. Once this happens, land values can fall unless the government continues to support the product price. The threat of reduced land values and reduced returns on past capital investments provides farmers with a strong incentive to lobby against reductions in price supports, even when it has become obvious that existing price supports are well above market-clearing levels. The prospect of continued price supports thus creates false expectations and encourages investments that would be unprofitable if price supports fell. Farmers who act in good faith upon these expectations feel they have been cheated if price supports are later reduced or eliminated. Nevertheless, short of paying farmers to retire resources from production, the only way to induce the needed resource adjustment is to allow capital losses and attempt to ease the adjustment by reducing price supports gradually.

Public policy appears to have induced excessive investment in parts of U.S. agriculture at various times. The cost of these misallocations does not always show up in the Federal budget. For example, sugar

producers and processors enjoy substantial income transfers as a result of protection from imports. Because of the way the program operates, the consumer bears all of the cost of these income transfers. Nevertheless, the costs are no less real than if the prices were supported by direct Federal Government purchases.

GUIDELINES FOR FUTURE FARM POLICY

Modern American agriculture has become well integrated into the world market and into the rest of the U.S. economy. As exports have grown, total demand for American agricultural products has become more price responsive, but the variability of that demand has also increased. This deepens the sector's susceptibility to periodic excess capacity, as at the present. When the Agriculture and Food Act of 1981 was passed, most observers thought that real farm prices would rise through the 1980s. In less than a decade, we have gone from fears of worldwide food shortages to such large stocks that we paid farmers to reduce harvested acreage by 55 million acres in 1983. This experience illustrates the need for flexibility in setting farm support prices. The present U.S. farm policies support the price to farmers in countries that compete with us for export markets and impede our ability to export. We need to allow prices to reach market-clearing levels if we wish to compete in the export market. If this is not done, a significant part of the resources in American agriculture will remain underemployed until the total quantity of these resources is significantly reduced.

Price supports do little to help farmers with below-average income because benefits are distributed in proportion to sales. A more efficient and equitable way to help low-income farmers would be to transfer income to them directly. While most commercial farmers do not have low average incomes, their incomes are variable, because variability in weather and in exports create instability in both supply and demand. The resulting instability in cash flow makes modern American farming a risky business.

There are better ways to reduce risk besides outright price supports. One is through insurance. Historically, when farmers lacked insurance markets in which to insure against fluctuations in yield and prices, the government provided price supports and various forms of subsidized crop insurance. Today farmers can ensure a specific price through forward contracting or selling futures contracts, although relatively few avail themselves of this opportunity. Farmers generally prefer not to commit themselves early, worried that they may lose the opportunity to sell at a higher price later if the market price rises.

This year trading in commodity futures options is scheduled to recommence on a trial basis for the first time in 50 years. With a put option, crop producers will be able to buy the right to sell their future production at a specified price without incurring the obligation to sell at that price. This may be more attractive to producers than selling on the futures market. In a similar manner, livestock producers will be able to buy insurance against increases in the price of their feed by buying call options. Thus, the resumption of trading in commodity futures options will allow farmers to insure against price risk. If the experiment is successful, there will be less need for the Federal Government to provide price insurance through price supports.

Buffer stock programs such as the Farmer Owned Reserve are designed to reduce variability in agricultural commodity prices. If these programs are continued, the acquisition price should be set below the expected long-run world market-clearing price. Setting the acquisition price too high would reduce exports and support the whole world market price structure. Stocks would become excessive, as happened in 1981 and 1982. In addition, the price band needs to be adjusted over time on the basis of world price movements, as is now done with soybeans, to reflect long-run trends in market conditions.

Agriculture, like other trading sectors, is strongly affected by interest rates and the value of the dollar. Therefore, macroeconomic policy is as important to farmers as farm policy. Special measures to shield one sector from the adverse effects of macroeconomic policy draw resources away from other sectors and place a greater adjustment burden on them. It would be more efficient to alter the macroeconomic policies that are damaging the traded goods sectors.

Because the United States is a large agricultural trading country, it has a large interest in further liberalization of agricultural trade and in securing more satisfactory rules concerning use of agricultural export subsidies. In past rounds of multilateral trade negotiations, substantial progress was made in lowering tariff barriers to agricultural trade. However, little progress on reducing nontariff barriers, such as quotas and variable import levies, has occurred. If we hope to persuade other countries to liberalize access to their markets for our exports, we have to be ready to offer freer access to our market for their exports. Freer access would also tend to stimulate economic growth in developing countries, and, over the longer run, increase their demand for our exports.

American agriculture has a long and remarkable record of producing abundant supplies of wholesome food for a growing Nation and for export around the world. But, the budget cost of farm programs has reached a level that is not sustainable. We must adopt policies to

encourage the necessary resource adjustment. National income would likely increase as a result of more efficient resource allocation, consumers would pay an even smaller fraction of their income for food than they do now, and farmers would benefit from greater economic health of their industry.