CHAPTER 10
DEVELOPMENTS IN AGRICULTURE SINCE 1950

An Overview Of Post-World War II Agriculture

Since the Second World War, American agriculture has been a sector of dramatic contrasts. Though it is generally presented as the textbook competitive market, it is one of the most heavily government-subsidized sectors in the economy. Productivity increases in agriculture have consistently been faster than in almost every other sector of the American economy, but it has been a continually declining sector with low incomes, a shrinking population, and a decreasing number of farms.

The contours of the postwar decline in the agricultural sector can be seen in Figure 10.1. The percentage declines in farm employment and population and in the share of GNP originating in farming between 1950 and 1988 are similar and pronounced. The number and average size of farm families plunged; this reduced the number of farms, which led to a 112.7 percent increase in average farm size from 1950 to 1988. The number of farms of 500 acres or larger has grown more rapidly than the number of smaller farms. Although they comprised less than 18 percent of all farms in 1987, larger farms accounted for nearly 67 percent of the harvested cropland as compared to 13.4 percent of the farms and 51.3 percent of the harvested cropland in 1969.

The regional differences in farm sizes are also distinct. The West North Central, West South Central, and, particularly, Mountain regions with their larger cattle raising and breeding ranches and wheat ranches, have continued to have the largest farms. Farms in the East North Central states tend to dominate the production of corn, sorghum, soybeans, and the feedlot finishing of beef cattle. Farms in the New England and Middle Atlantic regions, where there is relatively more dairy, hay, and truck farming, have not grown as rapidly. The South Atlantic and East South Central regions are the primary producers of tobacco and cotton. As the mechanization of planting and harvesting of these crops—especially cotton—increased, the smaller farms were combined into more efficient sizes. The Pacific states—especially California—have become the nation's primary producers of vegetables and fruits.

Fig. 10.1. Farm Population and Employment and the Percent of GNP Originating in Farming

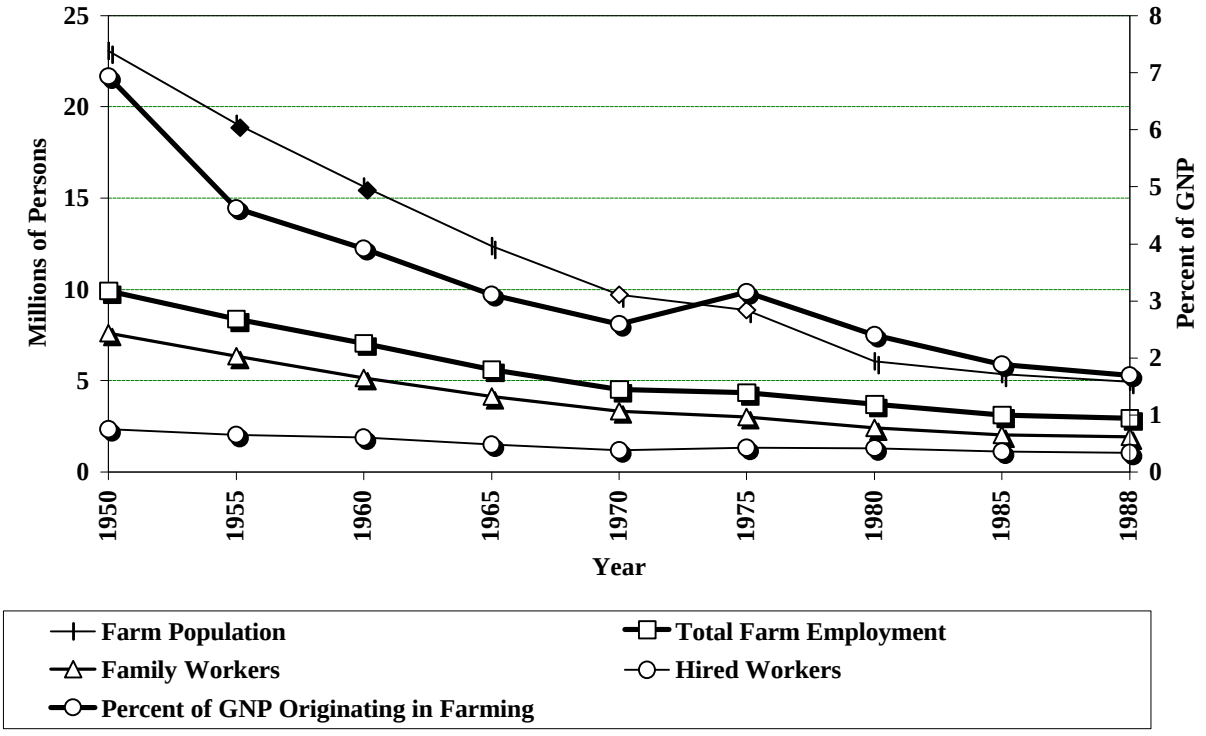
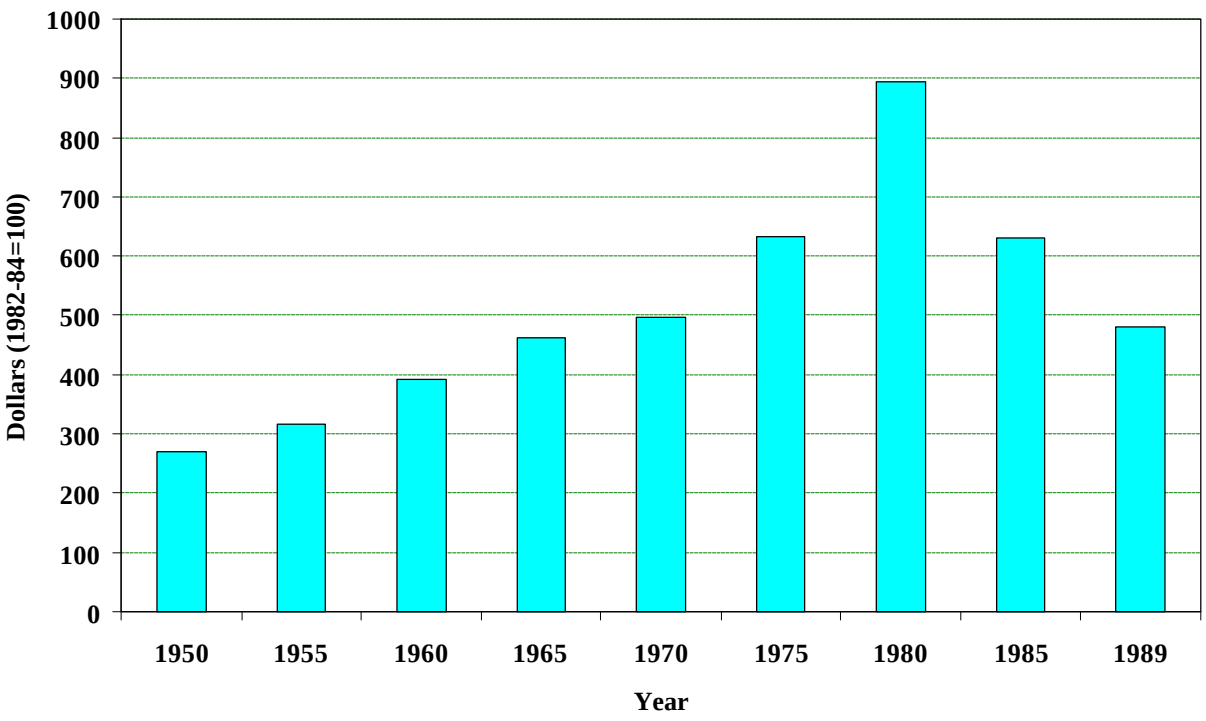


Fig. 10.2. The Average Real Value Per Acre of Farmland and Buildings



Though the absolute increase in the number of farm implements, such as tractors, grain combines, and corn pickers, ended in the 1960s, the declining number of farms meant that the number of implements per farm rose. The real average value per acre of farmland and buildings rose until 1980, rising at a more rapid rate in the late 1970s. Then, in a manner reminiscent of the twenties, farmers watched with dismay as the real value of their property (and their real wealth) diminished. (See Figure 10.2.) The 1980s decline more than wiped out all of the gains of the 1970s.

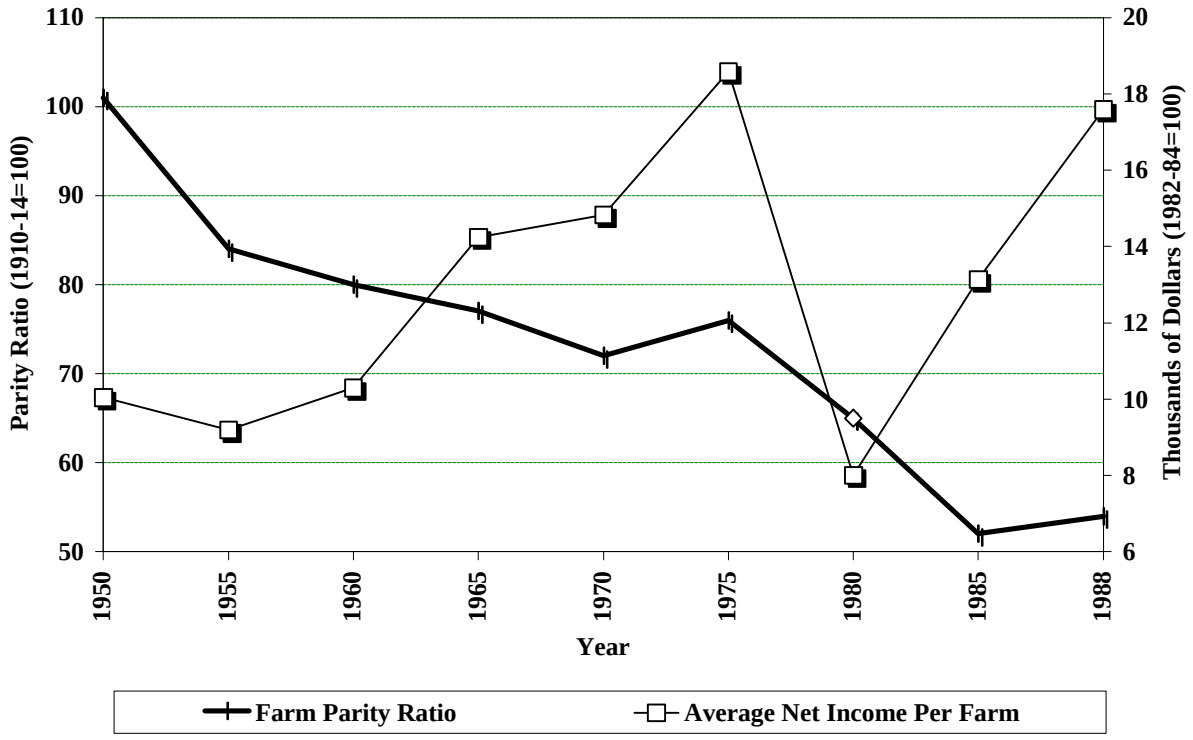
The distress of farmers in the 1980s can also be seen in Figures 10.3 and 10.4. The farm parity ratio shows a steady deterioration in farmers' terms of trade compared to the 1910-14 period. The real average net income per farm rose from 1955 to 1975 and then plunged; by 1988 it had not recovered the 1975 level. Farm real estate debt rose to 1980 and has since fallen, but the falling value of farmland and buildings in the 1980s caused the farm debt to asset ratio to rise sharply from 1980 to 1985. It is still higher than in any year prior to 1980.

The agricultural distress of the 1980s was associated, among other things, with the decline in agricultural exports. Since the Second World War, the federal government's agricultural programs have attempted (unsuccessfully) to isolate American market prices from world market prices to reduce price fluctuations and maintain higher prices. Not surprisingly, agricultural exports were lower in the 1950s, but these markets have since became more important for American farmers. Since 1965 the majority of the wheat produced on American farms has been exported, including almost 80 percent of the 1988 American wheat harvest. The exports of corn, soybeans, and cotton have also been large.

In response to the growing demand, particularly overseas demand, agricultural production expanded throughout the postwar era. Corn, rice, hay, and peanut production have grown most rapidly, while tobacco production has declined, primarily since 1975. Cotton production plummeted between 1965 and 1975 but has since recovered. Milk and egg production have grown slowly, while among livestock only beef production grew. Poultry production has expanded dramatically because consumers have been substituting poultry for red meat in their diets.

This increased production has occurred in spite of a dramatic decline in farm labor inputs. The employment of machinery did not increase until the prosperous 1970s and then declined sharply between 1980 and 1985. The primary growth input was agricultural chemicals, a change indicative of the

Fig. 10.3. The Farm Parity Ratio and the Real Average Net Income per Farm



productivity revolution in agriculture since the end of the Second World War.

Technological Change In Agriculture

The decline in the hours required to produce a unit of corn, sorghum, wheat, soybeans, tobacco, hay, potatoes, sugarbeets, and cotton averaged 84 percent from the late 1940's to the mid-1980s and ranged from -96.6 percent for cotton to -74.4 percent for tobacco. Two changes brought this about—decreases in the hours required per acre and increases in the per unit yields. The average decline in the hours required per acre was -66.7 percent and ranged from -52.6 percent for tobacco to -94 percent for cotton. The mean rise in yields per acre was 120.2 percent, and this ranged from 50 percent for sugarbeets to 240.5 percent for sorghum.

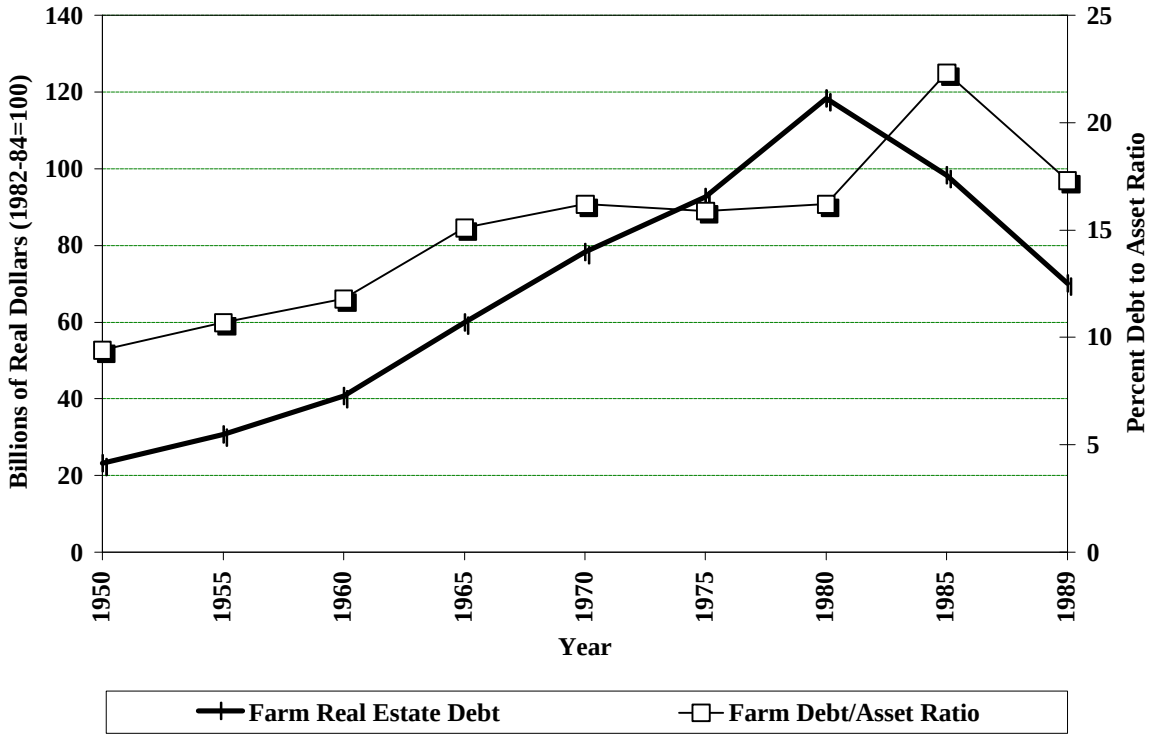
In dairying, the pounds of milk per cow rose 155.1 percent, while the labor-hours required per cow fell 81.4 percent to yield a 92.3 percent decline in the hours per hundredweight of milk. Similar changes occurred in egg production, when the labor-hours per 100 eggs produced declined 81.7 percent over this period. The labor-hours required per hundredweight of beef and pork produced fell 77.5 and 90 percent, respectively. The most dramatic changes occurred in broiler and turkey production where the labor-hours required per hundredweight fell by 98.2 and 98.5 percent, respectively.

These productivity increases are the result of the application of science to farm machinery, fertilizers and herbicides, and the life processes of animals and plants, that began in the late 1930s. This research and development has come from the seed, chemical, and machinery producers; from the Department of Agriculture, particularly the Office of Experiment Stations; and from government-subsidized laboratories of state universities.[1] To provide more detail on these productivity-enhancing developments, we can look at changes in farm machinery, fertilizers, herbicides and insecticides, and genetics and modern breeding.

Machinery

Changes in the types of farm machinery allowed one person to effectively farm increasingly larger amounts of land and tend larger quantities of livestock and poultry. By the 1970s large four-wheel drive and steering tractors were replacing the smaller two-wheel drive, front-steered row-crop tractor developed in the 1920s. These new tractors often had enclosed, air-conditioned cabs and complex, sensitive electronic equipment to monitor performance. The increasing size and power of these tractors allowed farmers to increase the size of plows so that plowing

Fig. 10.4. Farm Real Estate Debt and the Debt to Asset Ratio of Farmers



an acre of land took much less time. By the 1980s computer-guided laser equipment could adjust the depth of plowing and movement of plows instantaneously to compensate for changes in terrain. As the speed of plowing increased, this led to pressure to speed up the seeding operations. Improved seed drills could plant more rows and the capability for "precision planting produced better stands of crops—stronger and more uniform. The use of drills reduced seed and fertilizer costs."[2]

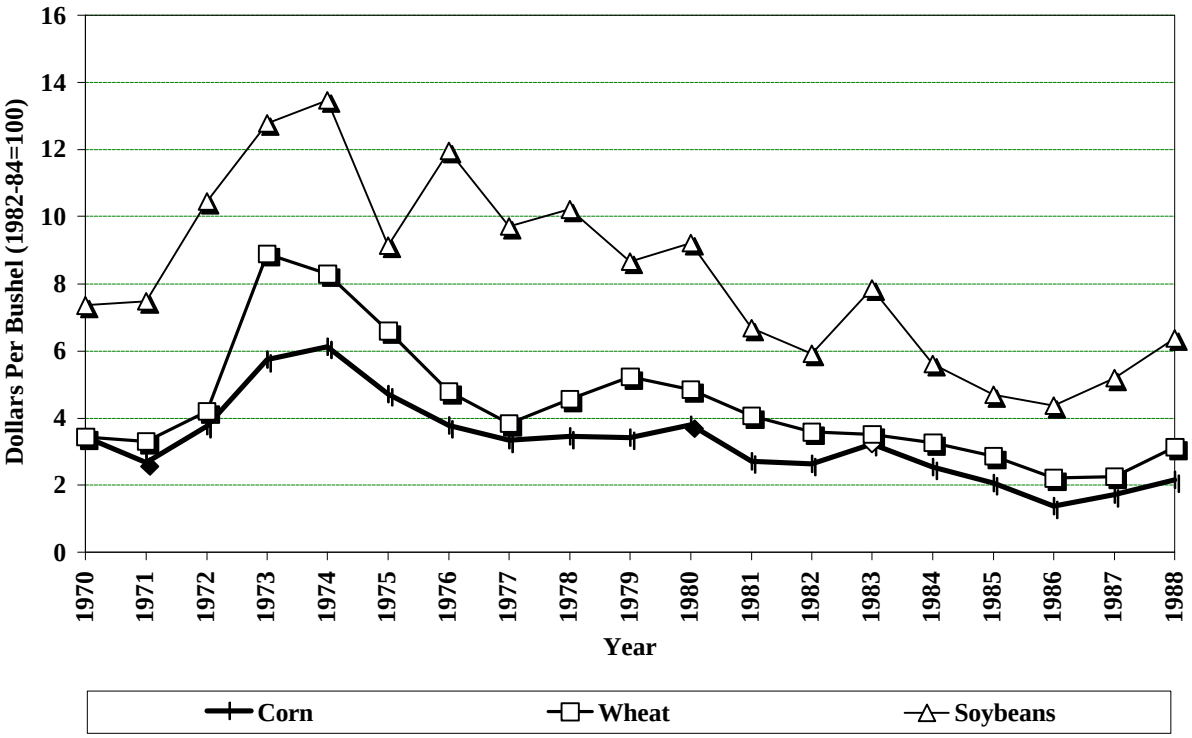
Similar changes occurred in harvesting machinery. Through the 1940s and 1950s most cornpickers were separate units either mounted on the row-crop tractor or pulled behind the it. Once picked, the corn was allowed to dry before being shelled. The portable corn dryer was first developed in 1949, and this began to allow shelling to take place in the field at the same time the corn was picked. The picker-shellers soon gave way to combines. By 1960, 20 percent of the combines produced were larger self-propelled combines. Automatic transmissions and automatic leveling of the separator units, regardless of the pitch of the ground and the rest of the machine, quickly appeared. In a short time the self-propelled combines could be adapted to pick and shell corn as well as harvest grains. By 1965 the combine corn picker-sheller was the most common machinery used for corn harvesting.[3]

The postwar development of the mechanical cotton picker allowed small sharecropping farms to be combined into the larger units required to use cotton-picking machinery.[4] Other mechanical improvements increased the use of silage and improved haying operations. By the 1950s the twine field baler had displaced the use of haystacks in the field. By the 1970s new balers created huge round bales that could be left in the field until required and then carried by tractor to the feedlot, which resulted in a dramatic reduction in labor requirements in haying operations.

Fertilizers, Herbicides, and Insecticides

Farmers had always faced the problem of maintaining soil fertility, and crop rotation was the time-honored method of doing so. The development of commercial fertilizers eliminated the need to rotate crops. Farmers could reduce the variety of crops grown and concentrate production on those that had better markets. Dry and unpressurized liquid fertilizers began to be applied at the same time as plowing and/or seeding took place, and it became possible to meter the fertilizer operations to spread fertilizers uniformly on uneven ground or at varying ground speeds. Anhydrous ammonia gained popularityy as a means to provide nitrogen to the soil.[5]

Fig. 10.5. Selected Real Crop Prices, 1970-1988



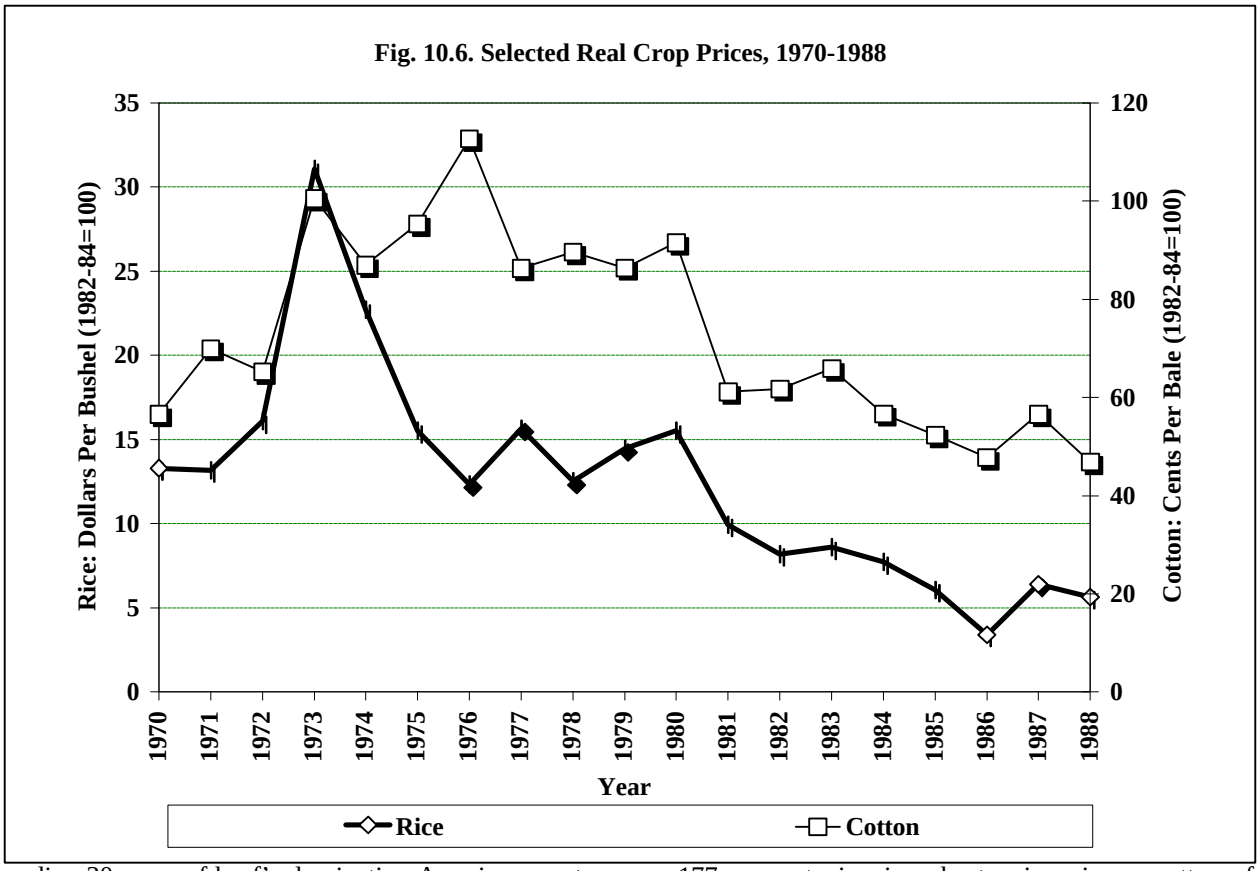
Weed and insect control have always been problems for farmers. Weeds compete for soil nutrients and crowd out crop growth. The herbicide 2,4-D first came to the market in 1945 and rapidly gained acceptance by farmers. Other herbicides, such as 2,4,5-T followed. Insecticides to control insect pests dated to the development of DDT prior to the Second World War. By 1946 the harmful effects of DDT had been discovered. Its use was curtailed, but other insecticides came onto the market[6] Other methods of pest control were also developed. In 1955 the Department of Agriculture developed a method to eliminate screwworms.[7] Species of flies that attacked fruit began to be controlled by trapping and destroying the males or by large-scale spraying. In 1947 scientists discovered metallic arsenate poisons that could kill parasites such as tapeworms and stomach worms, and in the 1950s and 1960s a host of such poisons were developed for large-scale application.[8]

Genetics and Modern Breeding

Twentieth century advances in genetics have brought about radical changes. The development of knowledge dealing with the fundamental biological processes of life and growth has made it possible to create new seed strains and livestock breeds that possess desired characteristics. One major thrust has been to redesign plants—such as cotton, rice, tomatoes, and corn—for mechanized agriculture.[9]

With improved biological knowledge in the postwar years, new beef cattle breeds were developed. Artificial insemination, begun by dairy farms, spread to beef cattle herds; this helped disseminate the new breeds and made possible the selection of more desirable breeding stock. New feeds incorporated such additives to accelerate growth. Antibiotics stimulated growth and increased survival rates. Dairy herds began to be composed of purebred cattle, and milk production per cow increased.

Poultry production presents another interesting example of the changes which occurred. Through the 1940s chicken and turkey were expensive and rare meats, consumed only on special occasions. They were raised on farms where they were allowed to run in the yards or fenced lots.[10] Around 1950 a revolution began in poultry production when assembly-line techniques were adopted. Chickens were raised in indoor individual cages, thus reducing losses from disease and accidents, requiring much less labor, and allowing greater control of feed and greater selection in birds for breeding purposes. Prices plummeted and by 1987 Americans consumed more chicken than beef,



ending 30 years of beef's dominating American meat consumption.[11]

The effect of the changes described here was to make agriculture in the postwar period the sector with the fastest rates of productivity increase in the American economy.

The Meat Crisis Of 1973

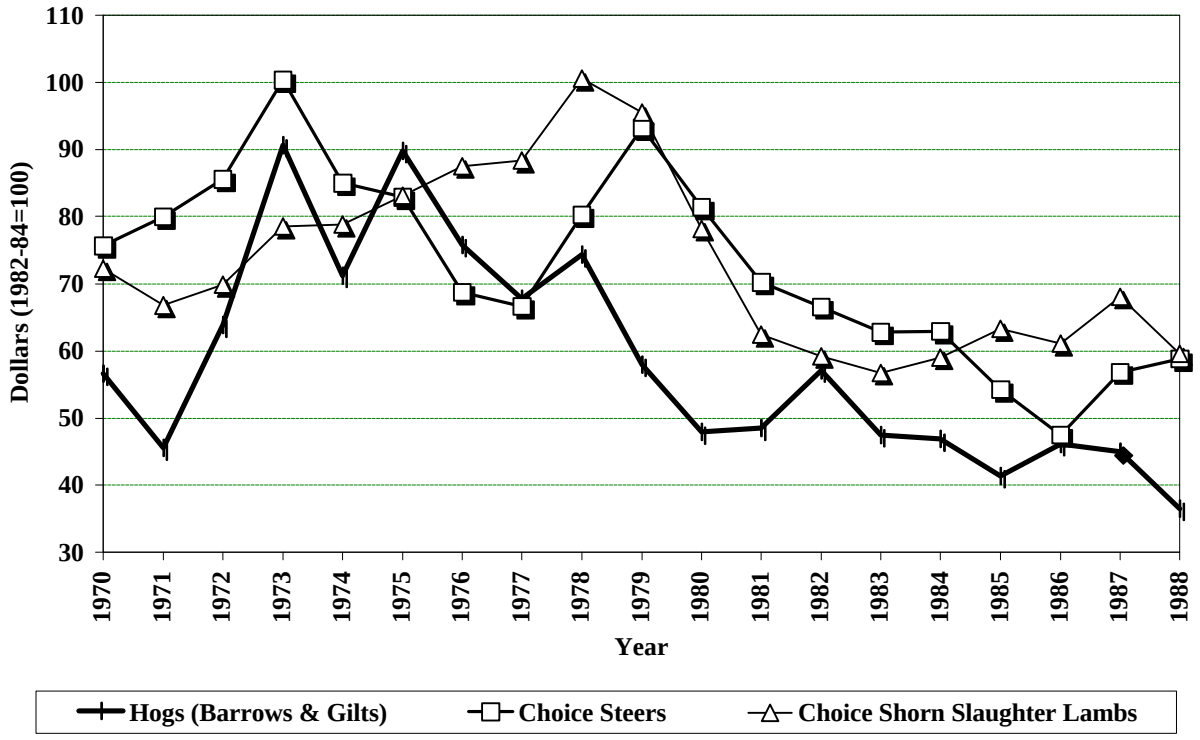
"The year 1973 was a watershed in American farm experience. Until then farm prices were generally depressed, and price supports...determined farm price levels."[12] (See Figures 10.5 to 10.8.) For three years after that, prices were generally above support levels, but they fell 24 percent by the end of 1977, reducing farm incomes and leading to strikes by farmers and pressure for higher farm prices. As a result of the explosion of beef and other meat prices in the spring of 1973, consumers, blaming "middlemen" for the price increases, organized boycotts, and price controls were reimposed. Farmers, responding to the jumps in price, increased production to the detriment of crop and livestock prices several years later.

These events began in the summer of 1972, when it was discovered that the Soviet Union had used a number of private grain brokers and purchased, in the aggregate, about 25 percent of the forthcoming 1972 wheat crop initiating a phenomenal 177 percent rise in wheat prices in a matter of months. Prices would not have been driven so high if the Soviet Union had contracted in the summer of 1972 to purchase wheat from the 1973 crop because more wheat could have been planted and harvested. Since most grains are good substitutes for each other, the rising wheat prices induced an increase in the demand for soybeans, corn, oats, and rye; all of these prices also rose rapidly.

Further complications appeared in 1972. The Humboldt current, off the west coast of South America, is one of the main sources for anchovies. In 1972 the current shifted, carrying much of the anchovy crop with it. The catches dropped alarmingly, and the Peruvian government put a ban on anchovy fishing so as not to permanently damage the breeding grounds. Anchovy prices soared. The main use of anchovies is as animal feed, and rising anchovy prices led to the use of feed grains, particularly soybeans, as a substitute.

The rising cost of cattle feed began to affect the supply of beef. Farmers began cutting back on beef production as it became less profitable. However, to decrease the longer run supply of beef requires an initial increase in supply as the cattle breeding stock is reduced. In July of 1972, real Omaha beef prices were $89.72 per 100 pounds. By

Fig. 10.7. Selected Real Livestock Prices, 1970-1988



September of 1972, Omaha beef prices had dropped to $78.95 and then began to rise.

As the culminating factor, the second devaluation of the U.S. dollar took place in February, 1973. The devaluation caused all U.S. products to be cheaper in terms of foreign currencies and all imports into the U.S. of foreign products to be more expensive in U.S. dollars. This had two effects. First, the price of U.S. soybean animal feed immediately became less expensive overseas increasing the total demand for U.S. soybeans, and thereby generating further increases in soybean prices. Second, the devaluation increased the domestic demand for domestically produced beef as consumers and businesses substituted away from suddenly higher priced imported beef.

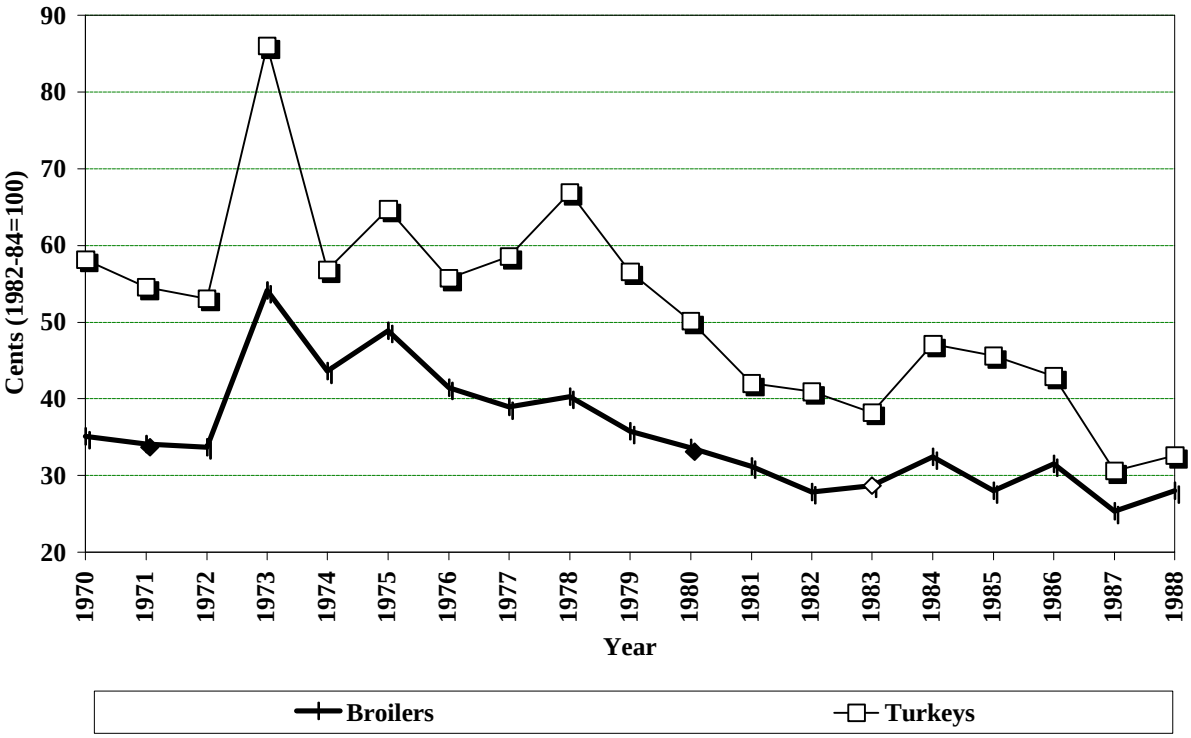
Thus, the two sets of events combined to cause an explosion of beef prices in the spring of 1973. The increased cost of producing beef, due to soaring grain and soybean prices, caused a decrease in the supply of beef, and the exchange rate devaluation, which increased the domestic price of imported beef, caused an increase in demand for domestically produced beef. As the price of beef rose, the demand for substitutes, such as chicken, pork, lamb, and fish, also rose, and their prices also began rising. These events culminated in nearly empty meat shelves in supermarkets, a reimposition of price controls, and consumer boycotts. Farmers may have contributed to the shortages to some extent by withholding beef cattle from the market in anticipation that the removal of price controls would result in higher prices.

Though declining, crop and livestock prices remained relatively high through the 1970s. Average net income per farm dropped sharply after the 1973 peak, while both farm equity and farm debt began growing. (See Figures 10.9 and 10.10.) Though wheat exports declined after the 1972-73 peak, exports of other crops, particularly corn, rose. These changes set the stage for the farm debt crisis of the 1980s.

The Farm Debt Crisis Of The 1980s

Conditions for farmers had deteriorated in the late 1970s and became much worse in the 1980s. Large numbers of farmers had their mortgages foreclosed. The farm debt crisis of the 1980s reminded many of the depressed state of farming in the 1920s though there were significant differences. As Table 10.1 shows, the debt crisis peaked in 1985 and 1986. Farm real estate debt increased during the 1970s and, with the rise in interest rates, did so most sharply from 1979 to 1980. The debt began to decline more rapidly after 1983. Farm non-real estate debt followed a

Fig. 10.8. Selected Real Poultry Prices, 1970-1988

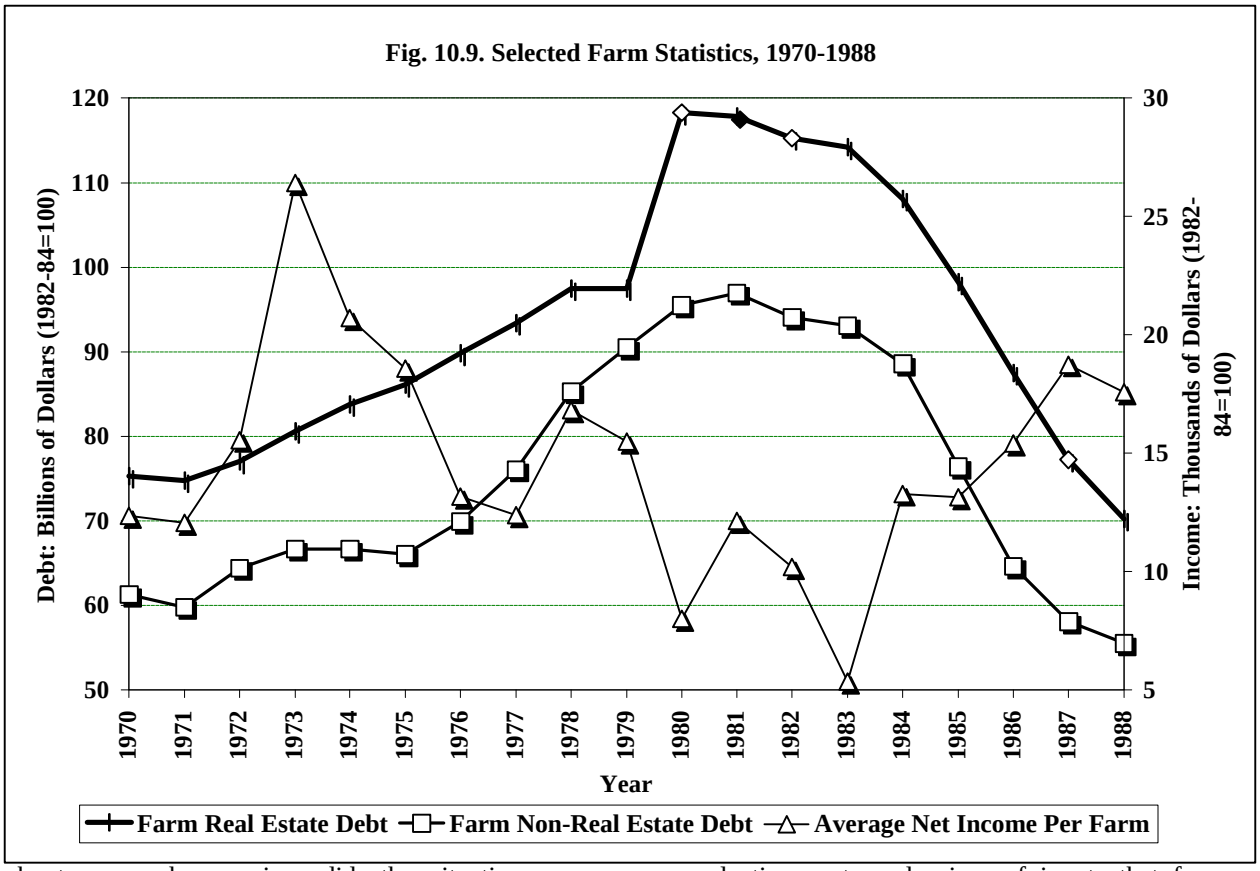


similar path. Farm equity, the difference between all farm assets and liabilities, rose sharply until 1980 and then dropped just as rapidly so that by 1985 it was less than in 1970.

The rise and fall in farm equity was primarily due to rising and collapsing farmland values. For the United States, farmland values fell 41 percent between 1982 and 1987. Farmland values in Iowa, which was in the center of the farm debt crisis, were about $400 an acre in 1970, $834 an acre in 1974, and $2,150 an acre in 1981. They fell to $800 an acre in 1986, a decline of 99 percent in five years and recovered to $1,050 an acre by 1988.[13] Because of declining farmland values, the farm debt/asset ratio rose to 1985 before declining. Neil Harl argues that a 40 percent debt/asset ratio is critical, because farmers with a debt/asset ratio of 40 percent of higher are particularly vulnerable to changes in agricultural markets, whereas farmers with a debt/asset ratio of 70 percent or more can be expected to last no more than two years.[14] Young farmers, who generally had more debt and less equity, were more vulnerable. The real average net income per farm from farming, which had reached $26,000 dollars in 1973, fell to extraordinarily low levels by the mid-1980s. Real crop and livestock prices fell during the 1980s and reached unusually low levels in the late 1980s.

The farm crisis of the 1980s had its roots both in the nature of farming and in a set of external events associated with actions by the federal government. As a competitive industry, economic profits tend to be short run. When extranormal returns persist, they become rents received by the factor or factors that are least elastic in supply. In farming that factor is land, so extranormal earnings, such as in 1973 and 1974, resulted in a bidding up of land prices. Any farmer who wishes to gain from the expansion of demand and higher agricultural prices in agriculture has to own land, which has always represented most of a farmer's wealth. Farmers were bitter and frustrated in the 1980s as they watched their wealth decline with the value of their farmland.

In the 1970s, after the explosion of grain prices, farmers began to buy additional farmland. Lenders, both private banks and federal agencies such as the Farm Credit System banks, were eager to lend on such good assets. The 1978 extension of the investment tax credit to single-purpose agricultural and horticultural structures encouraged a number of farmers to invest in additional facilities, particularly those geared toward hog production, further increasing their debtload. As long as farmland prices rose at least as fast as the rate of price inflation, and crop, livestock, and poultry prices tended to rise



about as much as prices did, the situation was manageable.

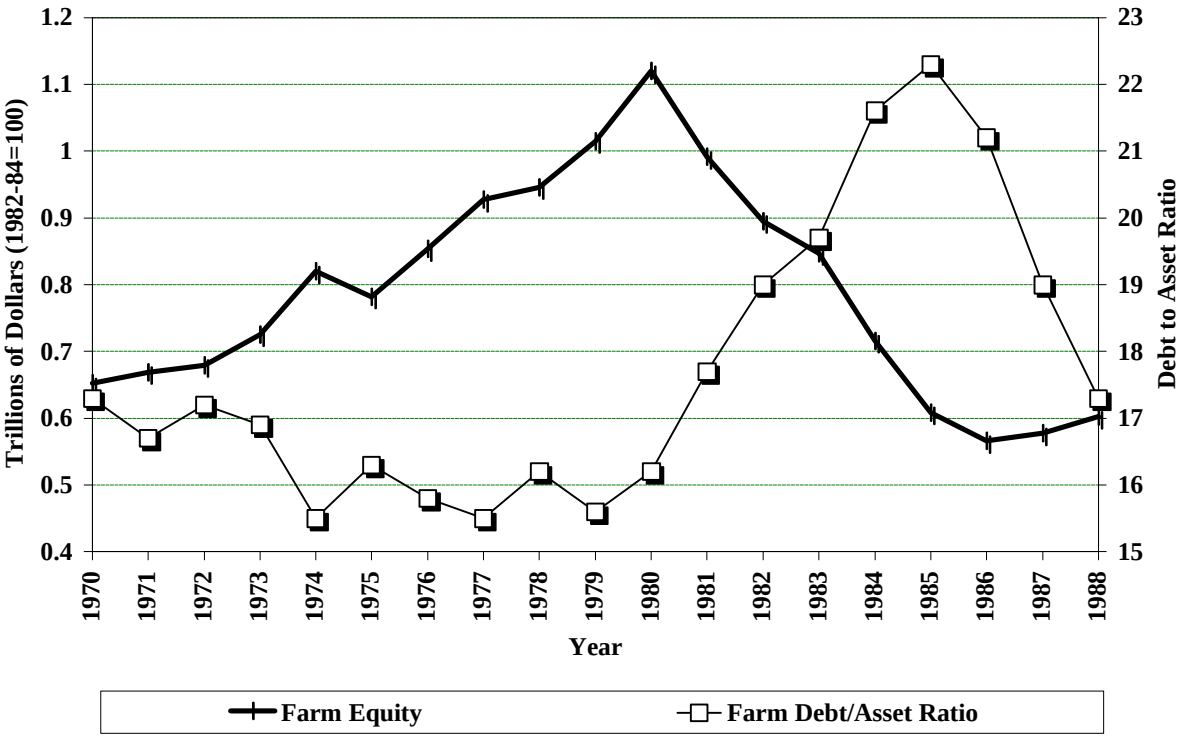
These conditions did not continue. There were droughts in 1980 and 1983, and the southeast suffered a protracted drought in the late 1970s. Cattle producers had incurred losses in the late 1970s, and hog producers generally suffered losses from 1980 through 1985. In 1979 the Federal Reserve System decided to change its policies to better combat the inflation raging through the economy. The policy changes announced on October 6, 1979, resulted in an immediate increase in nominal interest rates. Real interest rates shot up dramatically, and farmers who had taken out loans with adjustable interest rates found their interest costs rising as a result. The growing budget deficits of the 1980s further increased real interest rates.

The higher real interest rates resulting from the larger budget deficits and tighter monetary policy affected farmers in several ways.[15] First, higher real interest rates increased the direct cost of production credit for farmers. Second, farmers with variable rate mortgages found increasing interest costs for the land they owned. Third, higher interest rates in the United States attracted foreign investment funds, strengthened the dollar and raised the foreign prices of American exports, which reduced the quantities demanded. Fourth, higher real interest rates raised the production costs and prices of inputs that farmers purchased. Finally, higher real interest rates increased the costs of carrying farm products in inventory whether by the farmer or by intermediaries who purchased farm products.

Thus, the effects of higher real interest rates reduced domestic demand and foreign demand and caused incomes to fall. As incomes fell, so did farmland prices. Often the amount of supposedly safe equity of farmland backing up loans became less than the outstanding loan amount, and farmers were increasingly unable to meet their debt obligations. By 1985 farm exports had plunged to a seven-year low.[16] To make matters worse, by the mid-1980s some crop harvests were huge. The 1985 and 1986 corn harvests were called "the crop that won't quit."[17] The conventional storage areas were quickly used up, and corn was stored on town streets, in former silica sand mines, in converted bulk liquid containers at a former oil tank farm, and on barges floating in the Mississippi River.

As crop prices fell, more and more acres of crops were placed under federal crop price supports, and the federal government was again forced by default to purchase larger and larger amounts of crops. The Commodity Credit Corporation (CCC) purchased over 0.5 billion bushels of corn in 1985 and 1.3 billion bushels of corn in 1986. Between

Fig. 10.10. Selected Farm Statistics, 1970-1988



1982 and 1986 the CCC purchased 1.1 billion bushels of wheat in order to support wheat prices. In 1984 and 1985, 452 million bushels of soybeans were purchased. The federal expenditures to support crop prices were growing at an alarming rate. By 1986 federal crop subsidies were approaching $30 billion.[18]

The Farm Credit System's troubles mounted during the early and mid-1980s. The FCS held more than a third of all agricultural debt in the mid-1980s. To raise funds to make loans, the system sells bonds to the general public. The loans made to farmers were secured by the farm real estate and by the value of the crop production. During good times, the FCS banks had encouraged farmers to borrow to expand. With the deteriorating conditions of the 1980s, farmers began to be unable to repay loans as scheduled, and an increasing number of loans became delinquent. The FCS banks began to refuse to renew loans and finally began to foreclose on farmers who were severely delinquent. Because of accounting gimmicks that might well have been illegal in the private sector, the seriousness of the losses in the FCS were hidden for a time.[19] The Farm Credit System had losses of $2.7 billion in 1985 and $1.9 billion in 1986. By the middle of 1987, the Farmers Home Administration held 1.6 million acres of foreclosed farmland, and the Farm Credit System held 2.7 million acres of foreclosed farmland.[20] By the end of 1985, the FCS "held some $6 billion in loans of which the face amount exceeded the value of the collateral."[21] 1986 congressional legislation authorized the FCS to use "creative accounting to avoid tapping the U.S. Treasury for assistance and permitted the losses to be spread over as many as twenty years."[22] In 1987 congress, seeing that earlier acts had not provided remedies, enacted additional legislation.

Many small-town private banks that had made loans to farmers secured by the farm's real estate went out of business during the 1980s. As farm incomes fell, farmers reduced their spending to try to continue to make loan payments. Retail businesses in the smaller towns in agricultural areas were devastated. Farm equipment sales plummeted and farm implement dealers and manufacturers went out of business. In short, the farm debt crisis of the 1980s devastated farmers and rural communities.

Federal Farm Programs

Federal agricultural policies and programs in the postwar era are an extension of programs initiated during the New Deal of the 1930s, and they have worked no better in the postwar period than they worked before. As James Bovard has stated, "For

TABLE 10.1 INDICATORS OF FINANCIAL STRESS IN AGRICULTURE IN THE 1980S
(In Percent)

Financial Stress Indicator	1980	1985	1986	1987	1988
Average Delinquency Rate[1]	----	5.3	6.0	2.7	1.6
Farm Borrowers Who Had Bank Financing Discontinued	4.5	4.5	5.6	3.3	1.7
Farm Borrowers Loaned-Up to Practical Limit[2]	27.0	37.0	39.0	29.0	23.0
Farmers in Bank Lending Area Who Went Out of Business	2.1	4.8	6.2	4.6	2.8
Farmers in Bank Lending Area Who Went Through Bankruptcy	----	3.8	4.2	3.3	2.2

[1]Percentage of dollar farm loan volume 30 days or more delinquent.
[2]Farm customers who have reached their maximum debt load.

Source: *Statistical Abstract of the United States* (Washington, D.C.: U.S. Government Printig Office, 1990).

sixty years, the U.S. government has devotedly repeated the same agricultural policy mistakes."[23]

The first important changes in federal farm programs after the Second World War came with the Agricultural Acts of 1948 and 1949, that gave the CCC permanent status and borrowing authorization and maintained support prices at 90 percent of parity.[24] After the Korean War, the CCC inventories began accumulating at an alarming rate. The Agricultural Act of 1954 simply made the provisions of the 1949 act effective. Five of the six basic commodities were given flexible supports at 82.5 to 90 percent of parity, and the act further postponed changing to a modern parity formula.[25] Some of the CCC stocks could be set aside for donation or sale for enumerated worthy causes.

Officials in the Department of Agriculture and members of Congress had underestimated the rapidity with which huge surpluses would accumulate due to the relatively high price supports. The school lunch programs and the food stamp program were already in place to use some of the surpluses, but these fell far short of using up all of the excess. In 1954 Congress passed Public Law 480, an export program whereby less developed countries could purchase surplus government foodstuffs in the country's own currency and the funds could not, in general, be taken out of that country. It incurred the wrath of other agricultural exporting countries.

The surpluses continued to mount. Beginning in 1956 Congress enacted soil bank programs in hopes of achieving a 10 to 17 percent reduction in plowland as farmers took cropland out of production by "banking" or "renting" it to the government. Even farmers who did not directly participate in the soil bank program would benefit because, it was believed, the reduced output would raise crop prices.

Twenty-eight million acres were taken out of production, but the surpluses continued to mount because too few farmers participated and those that did kept the best land in production and placed the least fertile land into the soil bank, increased the nonland inputs, and produced as much if not more output. Because the output did not decline to any significant extent, the market price did not rise, and the only farmers who benefited were the participating farmers.

By 1960, the CCC wheat inventory was equal to the entire 1960 crop or to two years domestic wheat consumption. The corn stocks were five times what they had been in 1952, and wheat stocks were eight times what they had been in 1952. In desperation, Congress passed the Emergency Feed Grain Bill of 1961. It offered much higher payments for cropland diversion, and by 1963, 18 percent of the 1959-60 acreage was diverted, and feed grain carryover actually dropped. However, the program turned out to be extraordinarily expensive for the federal government. Congress finally extended the program to wheat in 1965; it was enormously expensive, costing five to six billion dollars a year, with the bulk of the payments going to the larger and wealthier wheat farmers.

There was general unhappiness with the farm programs as they existed in the late 1960s, and a new agricultural act was passed in 1970. This required a mandatory acreage set aside and attempted to limit the subisidies to any one farmer, but it was not very effective and continued to use outdated parity prices based on the 1910-14 period. The Agriculture and Consumer Protection Act of 1973 ended the use of parity prices by establishing support prices and target prices, which were desired prices generally above the market clearing level. The target prices could be set higher than support prices, and support prices could be set somewhere around the world market-clearing prices or lower. If prices dropped below support price levels, the CCC stepped in and made purchases through its loan program to move prices toward the support level. So long as prices were above the support price level, they were

left free to find their own market-clearing level, facilitating international trade and exports of farm commodities. If market prices were above the support price levels but below the target price levels, the U.S. government made deficiency payments to the farmers in the amount of the difference between the target and market prices multiplied by the farmer's allotment. Each farmer's allotment represented his or her share of the national acreage required to meet domestic and export needs as defined by the secretary of agriculture. A limit of $20,000 in annual deficiency payments to each farmer under the wheat, cotton, and feed grain programs was established, but again this was not effective.

In 1977 Congress passed the Food and Agriculture Act, which continued and extended features of the 1973 act. Target prices were now to be based on the average cost of production, and support prices were made somewhat flexible so as to interfere as little as possible with the marketing of the farm products. The secretary of agriculture was authorized to require farmers to set aside part of the cropland to be eligible for the deficiency payments. The 1977 act set the target price on the basis of the farmers' costs of production. However, as D. Gale Johnson points out, a large part of the cost of production is the cost of land, and land prices are merely the discounted present value of the product that the land can produce.[26] Thus, the value of the land actually depended upon the target prices that the government set. Therefore, within a broad range, government officials could set the target prices anywhere they chose and ultimately the land prices (and therefore costs of production) would increase up to that target price.

Between 1975 and 1982 Presidents Ford, Carter, and Reagan and the various Congresses continued to raise support prices even though target and support prices were generally above world prices.[27] In January of 1980, President Carter embargoed U.S. grain sales to the Soviet Union in order to punish it for its invasion of Afghanistan—an act that primarily harmed American grain farmers rather than the Soviet Union. In 1981 Congress passed farm legislation that called for crop target and loan prices to increase by 4 to 5 percent annually. By 1982, program costs were much higher, exports were declining, and government-owned surpluses were growing. Still, federal support prices for corn and wheat were raised.

In December of 1982, President Reagan proposed a new program called Payment-In-Kind, or PIK, which went into effect in 1983. Farmers who idled farmland were given surplus commodities from the CCC's holdings. Farmers responded by idling 77 million acres, or one third of all eligible farmland.[28] It was by all standards a generous program because the participating farmers received the equivalent of the crop output without incurring any of the production expenses, and the USDA then gave the farmers $391 million to store their crops so that they could wait and sell the PIK receipts at the most profitable time. Unfortunately, other producers were harmed. Egg, cattle, and pork producers faced higher prices for their feed and saw the profits from their farming operations drop. The program drove fertilizer, farm equipment, and seed dealers out of business across the United States.[29] A 1983 drought, combined with much greater participation in PIK than forecast, used up the government's stored surpluses, and the USDA actually had to go to the open market to purchase grain for some farmers participating in PIK.[30] PIK was a costly failure and was discontinued at the end of 1983.

The 1985 Food Security Act, which included attempts to save the Farm Credit System, again made minor adjustments to the continuing programs. Farmers were paid up to $200 an acre to divert land from the production of subsidized crops but were allowed to grow any unsubsidized crops on the same acreage. The shift from subsidized crops in surplus to unsubsidized ones simply developed surpluses in crop markets that previously were balanced, such as potatoes, edible beans, and popcorn. James Bovard has called this the "1986 massacre of unsubsidized farmers."[31] The price support programs have resulted in other distortions. The 1985 bill raised the support price for barley so that it was 96 cents a bushel higher than for oats; consequently, farmers planted much more barley and less oats. The resulting drop in oats production caused severe supply problems for producers that used oats in their products.[32] A sharply higher support price for sugarbeets, compared to wheat, allowed sugarbeet producers in western Minnesota to outbid wheat producers who had been renting the land for years creating great bitterness among the farmers.[33] The farm bill passed by Congress in October of 1990 essentially continued all of these programs.[34]

Milk prices are supported under a convoluted set of rules that takes up three volumes.[35] The supported price of milk rises with the distance from Eau Claire, Wisconsin. This discourages the shipment of milk from areas better suited to specialize in milk production and encourages more inefficient production, for example, in much hotter areas such as Florida where dairy cows produce less milk. To maintain the minimum price, the CCC buys "surplus" dairy products. Consumers then end up paying taxes to purchase and store the surplus and paying higher retail prices for dairy products. Several

times in the 1980s, the Department of Agriculture freely distributed surplus cheese to low-income and elderly citizens to keep it from being lost through spoilage. High domestic cheese prices led to greater imports, requiring quotas to limit cheese imports. In 1981 the CCC was purchasing nonfat dry milk at 94 cents a pound to support its price and then reselling it at 55 cents a pound to farmers to supplement their hog feed. In 1983, 1986, and 1987 the USDA launched "one-time" buyout programs to pay farmers to slaughter dairy cattle, thus reducing the dairy herds and surpluses. Farmers sent their least productive cows to the slaughter houses, raising the per cow milk production. The more generous 1986 program resulted in so many dairy cows being sent to slaughter that it devastated beef markets and bankrupted some beef cattle producers.

Sugar producers have also been heavily subsidized.[36] Extensive quotas and price supports ensure that little sugar is imported and sugar prices remain high. In the mid-1970s world sugar prices rose sharply. Sugar was then pushed into the free market by removing the price supports and import limitations, but as prices then began to decline, demands from sugar producers led to a restoration of price supports and full statutory protection in 1981. The high prices for sugar from sugarbeets and sugarcane led to an increase in the use of corn sweeteners.

The peanut quota system was established in 1941. Similar to tose for tobacco, the quotas amount to a government license allowing a farmer to sell peanuts and therefore are a way to limit or reduce output and keep prices higher.[37] These quotas allot production each year farm by farm, county by county, and state by state throughout the peanut belt. Prices are kept high by restricting production and imports and by the USDA guaranteeing minimum support prices (based on production costs) for quota holders. Peanut growers without a government quota can only sell their peanuts in the lower priced export market and for domestic production as peanut oil and meal. In 1990 the price for that excess production was $149.75 a ton, while the support price for quota peanuts was $631.47 a ton. The USDA employs "peanut police" to ensure that lower priced nonquota peanuts are not diverted from export and sold as more expensive quota peanuts.

Federal marketing orders for various fruits and nuts also date to the New Deal of the 1930s. Such marketing orders have included lemons, oranges, raisins, filberts, almonds, hops, nectarines, plums, cherries, spearmint, grapefruit, and prunes. Federal marketing orders are quotas assigned to individual growers. Production in excess of a quota requires that the excess be destroyed. Giving the excess away is even illegal.[38] The marketing orders, or quotas, are determined by committees sanctioned by the USDA. Not surprisingly, such committees are dominated by the larger growers, and commonly there are charges of bias toward the larger growers in the assignments of marketing orders.[39]

The conclusion that postwar federal agricultural programs have seriously harmed many American farmers and the American public is inescapable. The cost of these programs climbed dramatically during the 1980s. At the beginning of the 1980s, federal spending on farm programs was less than $3 billion but by 1986 and 1987 approached $30 billion. These figures do not include the indirect costs of higher prices for food and dairy products—higher prices that impinge most harshly on the poorest segments of the American population.

Resource migration out of the agricultural sector was not stopped, but merely slowed down. In fact, it is not clear that this was ever an aim of the programs. No funds were ever authorized to ease the transfer out of farming by providing retraining programs for farmers, no funds were mad available to lower the costs of moving from farm to nonfarm work and living environments, and the government never provided information about nonfarm alternatives. Throughout the postwar period, nearly every study and survey has shown that most of the benefits were funneled to the wealthiest farmers; very little went to the poorest farmers, who had the greatest need for assistance.

Though it has long been argued that the farm programs were necessary to raise the average incomes of farmers up toward the average incomes of nonfarmers, now even this is of doubtful validity. In a 1987 U.S. Department of Agriculture publication, Lloyd D. Teigen concluded that in every year since 1964, the average income of farm families exceeded the median income of all families.[40] From 1964 to 1970 the ratio was 106.8; from 1971 to 1980 it was 121.3; and from 1981 to 1987 it was 124.2.[41]

If the aim of the federal agricultural programs begun in the New Deal of the 1930s was to raise the incomes of farmers up to those of nonfarmers, that aim was achieved 25 years ago, and those programs have now outlived their usefulness.

Selected References

Bovard, James. *The Farm Fiasco*. San Francisco: The ICS Press, 1989.

Harl, Neil. *The Farm Debt Crisis of the 1980s*. Ames, IA: The Iowa State University Press, 1990.

Goodman, John C., and Edwin G. Dolan. "Farm Policy : Welfare for the Rich?" Chapter 8 in

Economics of Public Policy, 3d ed. St. Paul: West Publishing Co., 1985.

Johnson, D. Gale. "The Food and Agriculture Act of 1977: Implications for Farmers, Consumers, and Taxpayers." *Contemporary Economic Problems, 1978*. Edited by William Fellner. Washington: American Enterprise Institute, 1978.

Parker, William N. "Agriculture." Chapter 11 in *American Economic Growth: An Economist's History of the United States*. L. E. Davis, R. A. Easterlin, W. N. Parker et al. New York: Harper and Row, 1972.

Rosenberg, Nathan. *Technology and American Economic Growth*. New York: Harper and Row, 1972.

Schlebecker, John T. *Whereby We Thrive: A History of American Farming, 1607-1972*. Ames, IA: The Iowa State University Press, 1975.

Suits, Daniel. "Agriculture." Chapter 1 in *The Structure of American Industry*. 5th ed. Edited by Walter Adams. New York: Macmillan Publishing Co., 1977.

Teigen, Lloyd D. *Agricultural Parity: Historical Review and Alternative Calculations*. Washington, D.C.: U.S. Department of Agriculture, 1987.

Weiss, Leonard W. "Pure Competition and Agriculture." Chapter 2 in *Case Studies in American Industry*. 3d ed. New York: John Wiley and Sons, 1980.

Notes

1. This discussion of technological change in farming draws primarily upon the following sources: John T. Schlebecker, *Whereby We Thrive: A History of American Farming, 1607-1972* (Ames, IA: The Iowa State University Press, 1975); Daniel Suits, "Agriculture," Chapter 1 in Walter Adams, *The Structure of American Industry*, 5th ed. (New York: Macmillan Publishing Co., 1977); Nathan Rosenberg, *Technology and American Economic Growth* (New York: Harper and Row, 1972); William N. Parker, , "Agriculture," chapter 11 in L. E. Davis, R. A. Easterlin, W. N. Parker et al., *American Economic Growth: An Economist's History of the United States* (New York: Harper and Row, 1972), 397.

2. Schlebecker, *Whereby We Thrive*, 295.

3. Ibid., 297.

4. Ibid., 298.

5. Ibid., 301.

6. Ibid., 310.

7. Ibid., 311.

8. Ibid., 312.

9. Rosenberg, *Technology and American Economic Growth*, 134.

10. Suits, "Agriculture," 27.

11. Timothy K. Smith, "Changing Tastes: By End of this Year, Poultry Will Surpass Beef in the U.S. Diet," *The Wall Street Journal*, 17 September, 1987. Prior to the late 1950s, Americans consumed more pork than beef.

12. Leonard W. Weiss, "Pure Competition and Agriculture," chapter 2 in Leonard W. Weiss, *Case Studies in American Industry*, 3d ed. (New York: John Wiley & Sons, 1980), 68.

13. Neil E. Harl, *The Farm Debt Crisis of the 1980s* (Ames, IA: The Iowa State University Press, 1990), 38-39. Much of the following discussion relies on Harl's book.

14. Ibid., 30-37.

15. Ibid., 12.

16. "Farm Exports Plunge to 7-Year Low," *The Milwaukee Journal*, 7 November, 1985.

17. Dennis McCann, "Bountiful Harvest, Costly Problems: The Crop That Won't Quit**," *The Milwaukee Journal*, 21 September, 1986.**

18. Dennis McCann, "Too High a Price?" *The Milwaukee Journal*, 23 September, 1986.

19. For example, in some cases FCS books showed accrued interest payments on loans for which no payments had been received for three or four years. Charles F. McCoy and Jeff Bailey, "Blighted Ledgers: Farm Credit System Relies on Accounting That Hides Bad Loans," *The Wall Street Journal*, 7 October, 1985. Jeff Bailey and Charles F. McCoy, "Tricky Ledgers: To Hide Huge Losses, Financial Officials Use Accounting Gimmicks: Farm Credit System Plans Two Sets of Books; Insolvent S & L's Stay Open," *The Wall Street Journal*, 12 January, 1987.

20. Jean Marie Brown, "Farm Optimism Rises, but Woes Persist: Federal Outlays Stay High, Land Values Fall," *The Wall Street Journal*, 11 May, 1987.

21. Harl, *The Farm Debt Crisis of the 1980s*, 137.

22. Ibid., 142.

23. James Bovard, *The Farm Fiasco* (San Francisco: The ICS Press, The Institute for Contemporary Studies, 1989), 1.

24. The 1949 act defined three groups of commodities: (1) six "basics" of wheat, corn, cotton, tobacco, rice, and peanuts; (2) five "designated nonbasics" of wool and mohair, tung nuts, honey, Irish potatoes, and milk and milk products; and, (3) "other nonbasics," or the rest of some 170 U.S. farm commodities.

25 The parity formula compares the ratio of a current commodity price to a current index of farm input prices with a ratio of a commodity price in 1910-14 to the 1910-14 index of farm input prices. The assumption is that if the parity ratio is 100, farmers are relatively as well off today as in 1910-14 (the "golden era of farming"). The use of this parity ratio assumes tht farmers were as productive in 1910-14 as they are today. However, everyone recognizes that the productivity of farm labor, capital, and land has increased dramatically since the 1910-14 era. By the 1950s most saw the need to revise the parity formulas to account for this, however, the use of the parity formula based on 1910-14 prices and productivity benefited farmers and there was great resistance to modernizing the parity formula.

26. D. Gale Johnson, "The Food and Agriculture Act of 1977: Implications for Farmers, Consumers, and Taxpayers," in William Fellner, ed., *Contemporary Economic Problems, 1978* (Washington, D.C.: American Enterprise Institute, 1978).

27. Bovard, *The Farm Fiasco,* 37.

28. The farmland idled was equivalent to all of Ohio and Indiana and half of Illinois.

29. Ibid., 88.

30. John C. Goodman and Edwin G. Dolan, "Farm Policy: Welfare for the Rich?" chapter 8 in Goodman and Dolan, *Economics of Public Policy*, 3d ed. (St. Paul: West Publishing Co., 1985), 96-98.

31. Bovard, *The Farm Fiasco,* 95.

32. Bruce Ingersoll, "Random Harvest: Why Is Oats Output Down, Demand Up? Blame 1985 Farm Law: Its Mix of Subsidies and Curbs Dims Sunflowers, Bolsters An Abundance of Barley," *The Wall Street Journal*, 10 June, 1988.

33. Honey prices have been supported since 1950. The 1985 bill supported the 1,600 full-time beekeepers at a price of 66 cents per pound for honey, a price 15 cents above the wholesale price. The costs for the honey program rose from $4 million in 1980 to $88 million in 1985 and resulted in the CCC acquiring 115 million pounds of honey. Wool producers were subsidized at a price of $1.73 per pound for wool when the market price was around 75 cents a pound. James J. Kilpatrick reported in 1985 that 65 producers received support checks for over $100,000 and one producer received a price support check for $560,000.

34. For one example see Thomas M. Burton, "Cash Crop: Many Farmers Harvest Government Subsidies in Violation of Law: The Conner Family 'Split Up' Its Big Holdings to Get A Larger Federal Payment," *The Wall Street Journal*, 8 May, 1990; and, Charles McCoy, "Slaking a Thirst: Big Farmers in West Get Subsidized Water Despite Drought Crisis: Many Divide Their Holdings to Elude Federal Rules That Limit Allotments," *The Wall Street Journal*, 30 May, 1991. Also see Bovard, *The Farm Fiasco*, chapter 3.

35. This section is based on the following: Bovard, "Redistribution via Cows," chapter 6 in *The Farm Fiasco*; and Scott Kilman, "Market Maze: Why the Price of Milk Depends on Distance from Eau Claire, Wisconsin: Convoluted U.S. Price Rules Dismay Many Economists, Some Dairy People Too," *The Wall Street Journal*, 20 May, 1991.

36. See Lindley H. Clark, Jr., "How Protectionism Soured the Sugar Market," *The Wall Street Journal*, 5 November, 1987, and Bovard, *The Farm Fiasco,* 62-66.

37. Bruce Ingersoll, "Shell Game: Peanut Quota System Comes Under Attack for Distorting Market: Limits on Output and Imports Raise Ire of Processors; Congress Weighs Changes," *The Wall Street Journal*, 1 May, 1990.

38. Bovard, *The Farm Fiasco,* 180. Bovard's chapter 9, "Trampling Individual Rights," discusses marketing orders in some detail.

39. In 1980 the USDA threatened to sue Carl Pescosolido for giving his surplus oranges to San Francisco churches. Co-op and independent almond packers in California are required to spend 2.5 cents on specific advertising for each pound of almonds they sell. The almond marketing board is dominated by the California Almond Growers Exchange (CAGE) which markets the Blue Diamond brand of almonds. They easily spend the 2.5 cents per pound of almonds advertising the Blue Diamond brand, whereas the

small growers, which export or sell wholesale their almonds, have no specific brands to advertise. Therefore they are forced to forfeit the 2.5 cents per pound to the almond marketing board.

40. Lloyd D. Teigen, *Agricultural Parity: Historical Review and Alternative Calculations*, prepared for the U.S. Department of Agriculture, 1987, cited in Bovard, *The Farm Fiasco*, 48.

41. Calculated from Bovard, *The Farm Fiasco*, table 3-2, p. 49.