Agricultural Income and Finances

Bruce L. Gardner

The financial situation in agriculture has been a contentious issue in the interpretation of U.S. economic history from the post–Civil War depression of commodity prices to the "farm crisis" of the 1980s. Farmers have tended to see themselves as an economically disadvantaged group, a view that has gained salience among many historians and, of more practical importance, among many politicians. Agricultural economists have developed models of the "farm problem" in which a combination of economic characteristics conspire to bring about chronically unstable and low returns for producers of agricultural products. These include the perfectly competitive nature of farm product markets as contrasted with the market power of agribusinesses with which farmers deal, the price-inelastic supply and demand of farm products, and rapid technological change reducing labor requirements in agricultural production (see Brandow 1977; Gardner 1992; Olmstead and Rhode 2000).

Many of the data series in this chapter were developed, originally by economists in the U.S. Department of Agriculture (USDA), as indicators of the farm income and financial situation. The original impetus for these estimates was legislation that adopted the goal of achieving "income parity" for farmers and nonfarmers, using the period 1910–1914 as a basis for comparison (USDA 1940, 1988). A rapid and sustained drop in farm commodity prices occurred in 1920, following twenty years of prosperity capped with extraordinarily high prices during World War I. Net farm income fell from $9 billion to $3.4 billion between 1919 and 1921 (series Da1295). After a few years of recovery a still greater and more sustained farm income collapse occurred as the nation entered the Great Depression. Data to quantify this situation were developed simultaneously with a search for legislative solutions to farmers' economic problems, which culminated in the commodity programs of the New Deal.

The Farm Income Problem

A notable finding that reinforced political action in the 1930s, and continued to do so for decades afterwards, was documentation that farm incomes were well below those of nonfarm households for most of the twentieth century. But while farm income has been measured in a roughly comparable way for the period 1910 to the present, many issues in comparing farm and nonfarm household incomes have been controversial. Measurements of farmers' incomes from off-farm sources, income in kind from the farm, and cost of living differences between rural and urban areas all pose substantial difficulties (for details see Kirkpatrick 1926; D. Gale Johnson 1953; Thomas Johnson 1985; and Ahearn, Perry, and El-Osta 1993). Data availability and assumptions made about income comparisons have differed at different times, and no fully integrated data series has been published for the whole period. Nonetheless, recent work in the USDA indicates quite strongly that since 1950 farm household incomes have increased from the neighborhood of half of nonfarm incomes to approximate equality with nonfarm incomes after 1990 (see USDA 2000, Table 30). This has changed the underlying conditions for agricultural policy debate considerably.

In addition to farm income measures, the agricultural income and finance tables in this chapter include a variety of statistics that describe agriculture as a sector or industry, as well as details of the economic situation of farm enterprises and rural-farm people. The data include commodity prices, farm input prices, farm credit, farmers' receipts from sales of farm products, marketing margins, exports and imports of agricultural products, and income and balance sheet data for the farm sector.

Net farm income is the most frequently cited indicator of the economic health of U.S. farming. That income excludes off-farm sources of income, which make up the majority of farm households' income. Thus one must sharply distinguish the economic health of farming from the economic well-being of farm people. Estimates of net farm income reported in this volume are not estimated directly by asking farmers about their net returns. While the Current Population Surveys of the Bureau of the Census have asked farm households directly about net income, these estimates have been considered less accurate for sectoral aggregate purposes than indirect estimates, primarily because of understatement of reported net self-employment income (see Grove 1958).

Farm Revenues and Input Costs

Since 1930 the U.S. Census of Agriculture has asked farmers the value of sales of agricultural products from their farms. Data are thus available at five-year intervals since that time (except for the four-year intervals 1974–1978 and 1978–1982). The National Agricultural Statistics Service (NASS) and Economic Research Service, and their predecessor agencies in the USDA, provide annual estimates using census benchmarks and other data from buyers as well as sellers of farm products. Before 1930 all estimates relied on separate production and price information which was then combined to estimate the value of agricultural output. Strauss and Bean provided the first consistently derived long historical aggregate output and gross revenue series, covering 1869 to 1939 (Strauss and Bean 1940). They drew on many sources of information other than the census, and indeed their work crystallized the view that in many respects aggregates directly implied by census data were inaccurate.[1]

Towne and Rasmussen (1960) extended the data series at ten-year intervals back to 1800. Their estimates are provided in Table Da1277–1287. Continuous annual data derived from surveys of output of the agriculture sector, using USDA data in the NIPA accounting framework of the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce, are available only for the years since 1929. Those data are presented in Table Da1266–1276. The historical data have been revised several times, most recently in 1999, when the methods and definitions used by BEA were finally brought into full conformity with those of USDA.

Prices received by farmers have fluctuated sharply from year to year (see Figure Da-M) and over the longer term have declined in real terms by about half since 1910. This fall is typically attributed primarily to cost-reducing technical progress in agriculture, and has been cited as evidence that consumers rather than farmers have been the main beneficiaries of that progress. Statistics on prices are less well attested than are quantities in census

[1] For discussion of problems in the census data, see Johnson (1958) and Grove (1958).

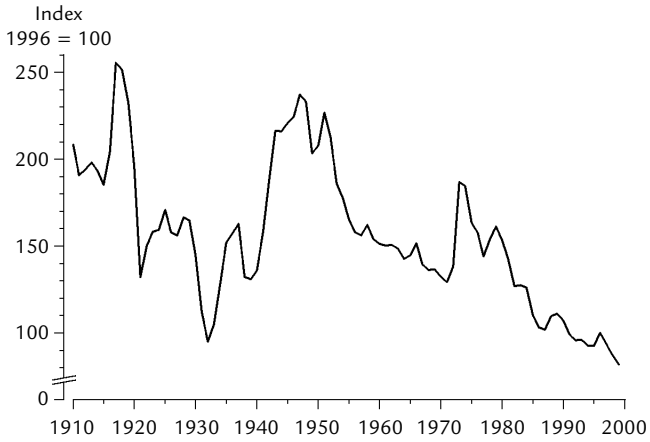

FIGURE Da-M Real prices received by farmers: 1910–1999

Sources

Series Da1337 deflated by series Ca13 and converted to an index with 1996 = 100.

data. The USDA began annual surveys of prices received by farmers in 1866 for crops and in 1867 for livestock.[2] At first data collection occurred at only one point during the year, and for a limited number of commodities. In 1908 a significant expansion of the USDA's price data collection efforts was made to obtain monthly estimates. Since that time commodity coverage has been expanded and sampling procedures improved, notably in 1977, to obtain more representative prices. The goal is to obtain prices that, when multiplied by the total quantity of the product sold by U.S. farms, would give the total amount received by farmers for that commodity. The relevant price is an average price received by farmers at the point of first sale to which farmers deliver their product for their sales of all grades, qualities, classes, and locations of a commodity. This price will in general be substantially different from an average spot price on an organized commodity market for any particular specification of a commodity. A more fundamental structural problem is that increasing quantities of farm output are sold under contracts that are only loosely linked to cash commodity prices. For example, in late 1998 cash hog prices fell to levels of $10 to $15 per hundred pounds, a third the level of a year earlier. But many producers had marketing contracts that cushioned them from these low prices through advance pricing or provisions that gave price supplements in low-price periods (to be offset by payback in high-price periods). Indeed, in some markets, notably eggs and broilers, the cash market has become so little used as to call into question the relevance of the prices reported from them.

Information on quantities of inputs used by farmers is less comprehensive, especially in earlier years. Data for farm labor, fertilizers, and other purchased inputs have been published in the Census of Agriculture since 1900. Prices paid by farmers have been estimated by the USDA since 1911. Preparation and publication of these data is currently the responsibility of NASS. Because these estimates were from the beginning associated with efforts to measure the standard of living of farm people, prices paid by farmers for consumption items as well as production expenses were collected annually until 1976. At that time it was decided that the prices of farm family living items were adequately measured by the Consumer Price Index of the Bureau of Labor Statistics (USDA 1990, p. 7). Since the 1970s the USDA's focus has been on prices of goods and services used in farm production. Prices of farm production items, like those of farm products sold, are an average of all grades, qualities, container sizes, locations, and brands of an item. The location is taken to be at the premises of the seller. Prices are reported by sellers. Surveys are conducted monthly, although not for all items each month, by NASS state offices, using mail, telephone, and personal interviews.[3]

Measurement of farm income uses all of the preceding estimates plus other information on farm credit, farmers' economic activities on farms other than their own, and the costs of owned land, machinery, and other durable inputs that yield services in years beyond the year in which they were purchased. The basic approach to measuring farm income has remained unchanged since the earliest estimates were made. Estimates of farmers' expenditures on inputs used are subtracted from the value of farm output to obtain a net income measure. Expense data needed to estimate net farm income were first collected by land-grant universities and state departments of agriculture in the nineteenth century. Such data were used to construct net income measures for farmers in a series of studies by agricultural economists both in the states and at the USDA. Summaries of their findings were published in the USDA's *Yearbook of Agriculture* and in USDA monographs and articles in economic journals (such as Gray 1923; Kirkpatrick 1926; Black 1928). For purposes of USDA farm income estimation, expenditures on key inputs used in farm production – hired labor, feed, fertilizers, machinery, seeds – were obtained principally from Census of Agriculture data before 1955. But many production expenses have been only irregularly covered by the census. The first comprehensive USDA survey of farm production expenditures was carried out in 1956, and such surveys have been increasingly utilized since that time. The invaluable contribution of the USDA estimates in *The Farm Income Situation* and its successor publications has been to develop consistently constructed farm income estimates for a long historical period.

Agricultural Value Added and Farmers' Wealth

An issue related to but distinct from farm income is agriculture's contribution to the nation's aggregate output (see Figure Da-N). For this purpose the appropriate indicator is value added by farm resources – the land, labor, and capital invested in the sector. The measure used is called "farm national income" (series Da1276). By this measure agriculture has generated increased real product,

[2] See USDA (1990) for further details on this and subsequent USDA efforts in farm price estimation.

[3] Indexes of prices received and prices paid were for more than fifty years scaled to a reference period of 1910–1914 = 100, originally because of congressional mandate. This reference period was chosen as an indicator of "parity," the idea being that in 1910–1914 prices received and paid were in an appropriate ratio to indicate market conditions conducive to good economic health for U.S. farming. Consequently, a value of less than 100 in subsequent years could be taken as an indicator of unfavorable economic conditions for farmers. This interpretation is questionable for long-term comparisons because technical change has substantially changed the quantities of inputs used to produce a given level of farm output. In the 1990 Farm Act the 1910–1914 reference point was dropped as a requirement for the USDA's official published estimates.

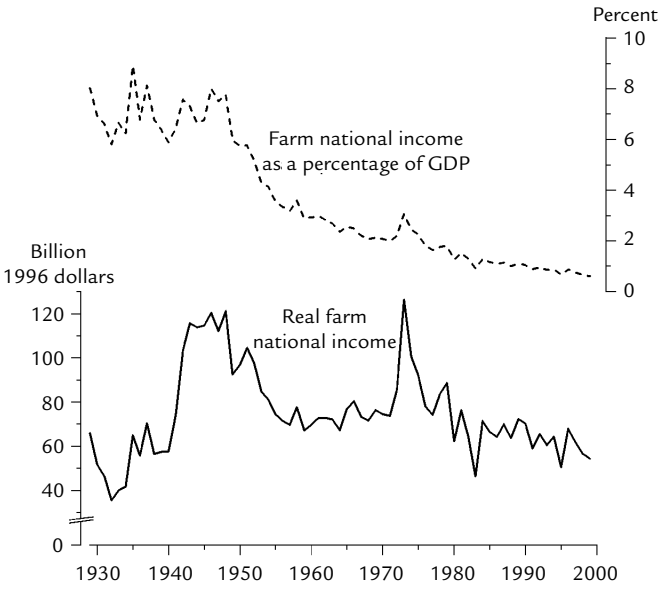

FIGURE Da-N Farm national income – real and as a percent of gross domestic product: 1929–1999

Sources

Series Da1276 deflated by series Ca13 and also expressed as a percentage of series Ca10.

but a continually declining share of the nation's gross domestic product (GDP), for as long as data have been collected.

A problem that has never been fully resolved is choosing the economic entities whose income should be counted in farm income. Two approaches are reasonable: (1) a product basis, measuring net income generated in the production of farm products, and (2) an establishment basis, measuring net income of entities meeting criteria to be counted as farms (whether owned and operated by a household, a partnership, a corporation, or other institutions, such as prisons and universities).

Net value added (the product-based measure of net income) and net farm income (the establishment-based measure) differ substantially. In 1993 data, for example, only 56 percent of sector net income goes to farm operators, with the rest going to nonfarm suppliers of land, labor, and capital.[4] Thus, the establishment approach to income accounting makes a considerable difference compared to a product-based concept. The 1960 data indicate that at that time the difference between the two approaches was smaller, although still significant. In earlier periods there is still less distinction between farm operators and producers of farm value added.

A longer-term picture of the economic health of farming is given by the balance sheet of farms. Farmers have long been noted for living poor and dying rich, as after a lifetime of paying off mortgage debt and living frugally they often end up with a substantial net wealth position. Information about ownership of farm real estate, machinery, and crop and livestock inventories has been collected in the Census of Agriculture since 1900. The USDA has supplemented these data with information on real estate prices, the value of machinery and equipment on farms, financial assets, and farmers' debts to estimate a full balance sheet whose "bottom line" is the net worth or "proprietors' equity" in U.S. farms as of January 1 of each year since 1940. Assets and debts exclude those of farm households that are related to business activity other than farming, and exclude personal assets such as corporate bonds and stocks in publicly held companies (but U.S. savings bonds are included). Coverage of the balance sheet data differs in one important respect from that of farm income data; namely, the balance sheet includes farm-related assets and debt of farm landlords who are not farm operators (whereas rents paid to nonfarm landlords are counted as a cost in net farm income accounting) (for further details, see Erickson, Hacklander, et al. 1989).

Marketing Margins and Market Power

Farmers have long complained that, because of the market power of agribusinesses compared to the atomistic competition that prevails in farming, buyers of their products pay too little. Attempts have been made to quantify changes in farmers' economic position with respect to agribusiness by looking at differences in the rates of growth of prices received by farmers and the costs to consumers for food products. The retail cost index, series Da1347, indicates the cost of a market basket of food produced from U.S. farm products compared to the base period 1982–1984. The index is constructed by the Economic Research Service of the USDA using retail price data from the Bureau of Labor Statistics, and differs only slightly from the "food at home" consumer price index (CPI) in series Cc10. The main difference between the two series is that the CPI includes the prices of imported food products and of seafoods and other food products not from farms, while series Da1347 concentrates on foods produced from U.S. domestic farm products. The farm value component in series Da1348 – the cost of the agricultural raw materials going into the market basket – is estimated by the Economic Research Service using raw material requirements for food products in the market basket valued at farm-gate prices. The farm-to-retail price spread is the difference between the retail cost of the food basket and the farm value of raw materials, adjusted for the value of nonfood by-products. Several related indicators of farm-retail price spreads are shown in Tables Da1347–1356. Their value as indicators of farmers' market power compared to that of processors and others in the marketing chain is a subject of debate. Such measures do not directly address the issue of market power, and a decline in the farmers' share does not necessarily have a negative implication for farmers' income (for a discussion see Elitzak 1999 and Wohlgenant 2001). Nonetheless, the data have been widely cited in political debate.

Summary

Overall, the data on agricultural income and finances describe a notable economic success story for the U.S. agricultural sector and for many of the individuals involved in the industry. Indicators of agriculture's success are its continuing international competitiveness as indicated by a strong export position (see Figure Da-O), the rising real incomes of commercial farms, and the declining real cost of domestically produced food in retail outlets (see series Da1347). At the same time, the number of farms has declined, there have been recurrent financial crises in agriculture, and small-scale farm

[4] The amount going to hired labor would be even larger – a 19.5 percent share – if $1.9 billion paid to workers in crews supplied by labor contractors were not excluded from farm value added (by both the USDA and the BEA).

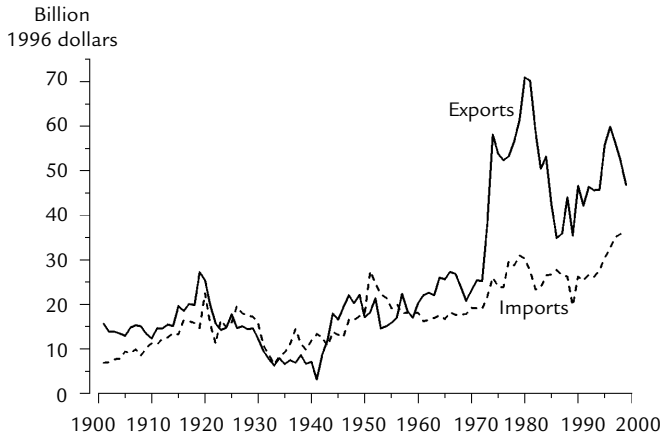

FIGURE Da-O Agricultural exports and imports: 1901–1999

Sources

Series Da1323 and Da1325 deflated by series Ca13.

operations have become increasingly nonviable as commercial enterprises. In a technologically dynamic and competitive industry facing limited demand, it seems inevitable that there will be losers as well as winners.

References

Ahearn, Mary, Janet Perry, and Hisham El-Osta. 1993. "The Economic Well-Being of Farm Operator Households, 1988–90." Agricultural Economic Report No. 666. U.S. Department of Agriculture Economic Research Service.

Black, John D. 1928. "Farm Business Surveys as Sources of Data on Farm Income." *Review of Economic Statistics* 10: 174–81.

Brandow, George E. 1977. "Policy for Commercial Agriculture, 1945–71." In L. Martin, editor. *A Survey of Agricultural Economics Literature*, volume 1. University of Minnesota Press.

Elitzak, Howard. 1999. "Food Cost Review, 1950–97." Agricultural Economic Report No. 780. U.S. Department of Agriculture Economic Research Service.

Erickson, Kenneth, Duane Hacklander, et al. 1989. "The Balance Sheet." *Major Statistical Series of the U.S. Department of Agriculture*, volume 11. Agriculture Handbook No. 671.

Gardner, Bruce. 1992. "Changing Economic Perspectives on the Farm Problem." *Journal of Economic Literature* 30: 62–101.

Gray, L. C. 1923. "Accumulation of Wealth by Farmers." *American Economic Review* 159–78.

Grove, Ernest W. 1958. "Comment." In *Studies in Income and Wealth*, volume 23: *An Appraisal of the 1950 Census Income Data.* Princeton University Press.

Johnson, D. Gale. 1953. "Comparability of Labor Capacities of Farm and Nonfarm Labor." *American Economic Review* 43 (3): 296–313.

Johnson, D. Gale. 1958. "An Appraisal of the Data for Farm Families." In *Studies in Income and Wealth*, volume 23, *An Appraisal of the 1950 Census Income Data*. Princeton University Press.

Johnson, Thomas H. 1985. *Agricultural Depression in the 1920s: Economic Fact or Statistical Artifact*. Garland Press.

Kirkpatrick, E. L. 1926. "The Farmer's Standard of Living." Departmental Bulletin No. 1466. U.S. Department of Agriculture.

Olmstead, Alan L., and Paul W. Rhode. 2000. "The Transformation of Northern Agriculture, 1910–1990." In Stanley Engerman and Robert Gallman, editors. *The Cambridge Economic History of the United States*, volume 3. Cambridge University Press.

Strauss, Frederick, and Louis H. Bean. 1940. "Gross Farm Income and Indices of Farm Production and Prices in the United States, 1869–1937." Technical Bulletin No. 703. U.S. Department of Agriculture.

Towne, Marvin E., and Wayne D. Rasmussen. 1960. "Farm Gross Product and Gross Investment in the Nineteenth Century." In *Studies in Income and Wealth*, volume 24, *Trends in the American Economy in the Nineteenth Century.* Princeton University Press.

U.S. Department of Agriculture. 1940. *The Farm Income Situation*. Agricultural Marketing Service, FIS-1.

U.S. Department of Agriculture. 1988. *Major Statistical Series of the U.S. Department of Agriculture*, volume 3, *Farm Income.* Agricultural Handbook number 671.

U.S. Department of Agriculture. 1990. *Major Statistical Series of the U.S. Department of Agriculture*, volume 1, *Agricultural Prices, Expenditures, Farm Employment, and Wages.* Agricultural Handbook number 671.

U.S. Department of Agriculture. 2000. *Agricultural Outlook*.

Wohlgenant, Michael. 2001. "Marketing Margins: Empirical Analysis." In B. Gardner and G. Rausser, editors. *Handbook of Agricultural Economics*. Elsevier.

FARM POLICY

Alan L. Olmstead and Daniel A. Sumner

Government intervention in the farm sector has taken many forms, ranging from investments in public goods to attempts to use price and income supports to raise farm incomes. As the essay on agricultural productivity in this chapter demonstrates, government policies to promote basic and applied research along with farm extension work have raised farm productivity enormously. In addition, a number of government programs, such as transportation systems, rural mail delivery, and rural electrification, have provided rural infrastructure. Land policies, by which the federal government "privatized" much of the continent, represent another class of government policy that has had a major effect on farmers. For example, the Homestead Act of 1862 allowed farmers to acquire 160 acres of federal land free of charge.[1]

This essay concentrates on policies to raise farm incomes or commodity prices through a variety of schemes. These are the policies usually referred to as "farm programs." Collective action to raise agriculture prices in what is now the United States dates back to the early days of colonial Jamestown, when Virginia planters attempted to limit tobacco production. In the nineteenth century, many states experimented with agricultural bounties to encourage the introduction of new crops, and Maine briefly offered subsidies on wheat grown within its borders. But these initiatives were minor aberrations in an era in which farmers grew what they pleased and received prices determined by the law of supply and demand in relatively free markets. (Domestic and foreign tariff policies represented the major market distortions.) In fact, throughout the nineteenth and early twentieth centuries, American agriculture approximated the competitive model, but by the end of the twentieth century many parts of agriculture had become highly regulated and subsidized (Effland 2000). Federal commodity programs, originally justified as emergency measures, have proven difficult to end as farm incomes and land prices have become dependent on government subsidy. Table Da-P shows how the character and extent of government involvement in agriculture has changed over the

[1] This act and other land laws are discussed in Chapter Cf.