

# Profile of the U.S. Farm Sector

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## ABSTRACT

The farm sector of the eighties bears little resemblance to its forebear of the thirties. Specialization, technology, and a sophisticated financial system of credit, tax, and international monetary policies have dramatically altered U.S. farming from a set of numerous, small, labor-intensive units to a diverse sector encompassing a wide scale of size, costs, needs, and production efficiencies. Indeed, there is a growing concern that the farm sector has grown so diverse that a single farm policy may be insufficient to address those needs. Domestic and international economic policies play important roles in the well-being of farmers, and future farm policy will need to incorporate those concerns if it is to address the issue of instability of incomes and prices.

KEYWORDS: Debt-asset ratio, farm income, farm numbers, farm size, financial organization, specialization, tax policy, technology.

## INTRODUCTION

The organization of farming and the effects of public policies upon it have been issues in American public life since independence. For the first 80 years, the principal issue was the basis upon which public land was made available to settlers, culminating in the Homestead Act of 1862. From then through World War I, the establishment of agricultural science, extension, and marketing services received major attention. The agricultural depression of the twenties brought concern for the generally low level of farm income and attempts to deal with it through the first commodity programs. The Great Depression created a crisis for agriculture which prompted New Deal agricultural programs, directed toward the great bulk of family-operated farms with severe income problems.

The postwar debate on agricultural policy focused on an agriculture composed primarily of family farms, which were defined as viable operations, able to support their operators adequately and offer full employment (3; 4, p. 68). The consolidation of part-time, marginal, or subsistence operations into larger farms was part and parcel of a family farm policy. The major policy issue relating to small farms during the forties, fifties, and sixties was the problem of moving excess human resources out of agriculture and off the small farm. Rural development programs were seen as a way to provide jobs off the farm in rural areas. The small farm issue came to be seen as a welfare matter that really had little to do with commercial agriculture (4, p. 70). The major structural problem of the forties--the overabundance of resources, especially labor--was

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largely solved by events of the fifties and sixties--by the millions, the operators of such small farms and their families picked up and moved to cities and suburbs.

Today's commodity policies are the descendants of the programs of the thirties, differing in many ways but more alike than different. At the depth of the Depression, it was decided that commodity programs would be generally neutral as to farms of different sizes. Farms of all sizes were in deep trouble and all would be helped by curtailing production and raising prices.

During the past half-century, the organization of farming and its economic and financial situation have changed markedly. There is mounting evidence that the farm sector has grown so diverse that it may require a policy perspective that extends beyond the farm gate, implying that the policies appropriate for the eighties need to be examined anew.

## THE EVIDENCE OF DIVERSITY IN THE FARM SECTOR

To examine the diversity of the farm sector, this section looks at two broad components: the organization of production and the financial organization.

### Organization of Production

The U.S. farm sector has evolved from a large collection of small family-operated units to a spectrum of farms ranging from small to large, with varying degrees of output, technology, and specialization.

### Farm Numbers and Sizes

The number of farms has declined by nearly two-thirds since 1935 while the amount of land in farms has decreased only 1 percent (table 1). The decline in farm numbers slowed after the fifties and sixties and is now confined to farms with sales of less than \$40,000 per year in current dollars.

When corrected for inflation, farms with sales of \$40,000 to \$99,999 increased in number until 1970 and then declined (fig. 1 and table 2). In the seventies, the rate of decline in farm numbers was greatest for the smallest farms and the rate of increase was highest for those with sales over \$200,000 per year. The change in the inflation-corrected size distribution has been due to technology, increasing off-farm income, and increasing specialization.

### Family Farms and Sales Classes

Throughout the history of agricultural policy, support for a family farm concept has assumed a primary position. In economic terms, the concept of the family farm is one large enough to support a family and provide fulltime employment for the operator. In this article, family farms are defined as those with sales of \$40,000 to \$199,999 at 1980 prices; those with larger sales are defined as larger-than-family farms, many of which are multiple-generation family farms.

Because of the relative decreases in the sales of small farms and the growth of very large farms, the share of sales by the largest 5 percent of farms has gradually increased:

Percent of total sales by largest 5 percent of farms

1939	38.3
1949	38.8
1960	41.5
1970	46.6
1980	50.6
1982	50.1

Only 55 percent of all farm operators listed farming as their principal occupation in 1982 (table 3). About 90 percent of those with sales of \$40,000 or more were principally farmers, but only 23 percent of those with sales of less than \$2,500 were, and many of these were 65 years or older.

Specialization

Farming has become increasingly specialized as farmers have applied specialized, capital-intensive production technologies that increase the advantages of size, aided by Government farm programs that reduce the need for farm diversification as a method of lessening risk. But specialization has increased for all commodities--not just for those with Government programs (table 4).

Just as farms are becoming more specialized in producing specific commodities, they are also becoming more specialized in performing the functions required for producing and marketing agricultural commodities. Much of the work and many of the functions formerly performed on farms have shifted to nonfarm firms. Much more of the inputs which farmers use are now purchased rather than produced on the farm itself, and this trend is continuing. Between 1910-14 and 1980, total inputs used in farming increased 19 percent. Those purchased by farmers rose 224 percent, while nonpurchased inputs--operator and family labor and inputs from land, buildings, and machinery--decreased 48 percent. At the same time, intensive use of purchased inputs has increased farmers' vulnerability to rising prices and interruptions of input supplies.

Technology of Production

American agriculture achieved tremendous gains in productivity between 1930 and 1980. Total output rose by almost 150 percent, while total inputs increased only slightly--by 7 percent (fig. 2). The source of productivity gains was adoption of technological change. Mechanization, hybrids and improved varieties, commercial fertilizer, pesticides, and irrigation all enhanced the productivity of land and labor, encouraged the substitution of capital for labor, and facilitated a large outmigration of labor from agriculture (8,19,24). In the last two decades alone, labor use dropped by nearly half, but the share of hired labor increased (fig. 3). Land inputs have remained fairly constant. Current agricultural production technologies were developed in an era of abundant, low-cost energy and were designed primarily to replace human labor with mechanical power and chemicals. This input substitution has been a key factor behind the decreasing number and increasing size of farms for several decades. Since financial stress of declining incomes and asset values gripped the farm sector in the early eighties, chemical input expenditures have declined.

Technological changes, especially those which encouraged substitution of capital for labor, combined with specialization of production into farm units producing

Table 1--Farm numbers and sizes

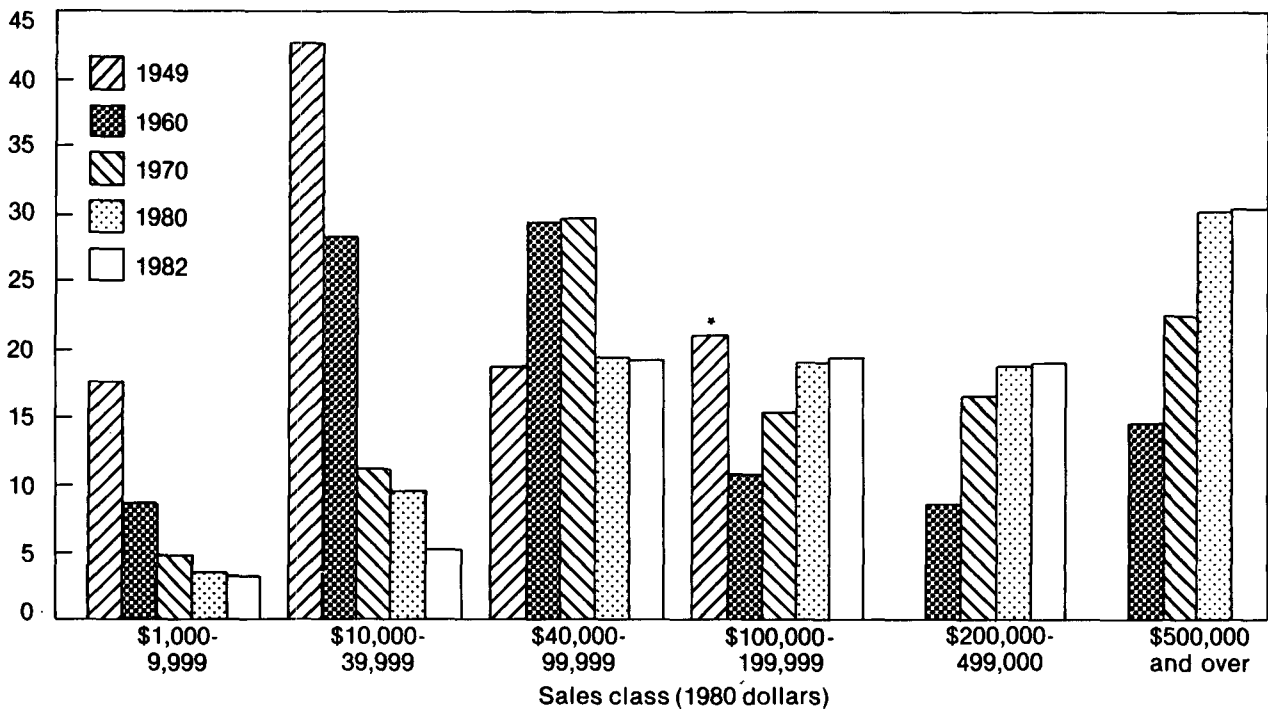
Year	Number of farms 1/	Land in farms	Average size of farm
	Thousands	Million acres	Acres
1930	6,295	990	157
1935	6,812	1,054	155
1940	6,102	1,065	175
1950	5,648	1,202	213
1960	3,963	1,176	297
1970	2,949	1,102	374
1980	2,433	1,039	427
1981	2,434	1,034	425
1982	2,401	1,028	428
1983	2,370	1,024	432
1984	2,333	1,020	437

1/ The definition of a farm changed in 1959 and 1974.

Figure 1

**Distribution of farm sales by sales class, 1949-82**

Percent of sales



\* Includes all farms with sales of \$100,000 or more in 1980 dollars.



Table 3--Age and principal occupation of farm operators by sales class, 1982

Sales class	Farming		Other occupations		Total		
	Under: 65 : 65 :and older:	Total : farming:	Under: 65 : 65 :and older:	Total : non- farming:	Total : and non- farming:	Total : and non- farming:	
	Percent						
\$500,000 or more	81.9	9.1	91.0	7.7	1.3	9.0	100.0
\$250,000 to 499,999	86.1	6.9	93.0	6.2	.8	7.0	100.0
\$100,000 to 249,999	86.6	6.2	92.8	6.5	.7	7.2	100.0
\$40,000 to 99,999	79.0	9.2	88.2	10.7	1.1	11.8	100.0
\$20,000 to 39,999	57.6	14.3	71.9	25.4	2.7	28.1	100.0
\$10,000 to 19,999	38.7	17.8	57.5	38.1	4.4	42.5	100.0
\$5,000 to 9,999	24.9	16.7	41.6	50.8	7.6	58.4	100.0
\$2,500 to 4,999	18.8	14.8	33.6	57.5	8.9	66.4	100.0
Less than \$2,500	12.9	9.8	22.7	66.9	10.4	77.3	100.0
Total	42.9	12.2	55.1	39.3	5.6	44.9	100.0

Source: Census of Agriculture, 1982, Vol. 1, Part 51, pp. 48-49.

Table 4--Farm specialization: Farm sales derived from primary commodity, by type of farm, 1969 and 1982

Type of farm	1969		1982	
	Percent : of : farms	Share of : sales from : primary : commodity	Percent : of : farms	Share of : sales from : primary : commodity
	Percent			
Cash grain	21.3	81	25.7	86
Tobacco	5.2	80	5.9	80
Cotton	2.3	69	0.9	76
Other field crops	1.8	82	4.5	79
Vegetables	1.1	86	1.4	86
Fruits and nuts	3.1	95	3.8	95
Horticultural specialties	--	--	1.3	98
Dairy	15.1	78	7.3	84
Poultry	3.3	94	1.9	95
Animal specialties	--	--	2.9	95
Other livestock	32.8	84	40.5	86
Total	86.0		97.5	
Other farms	14.0	less than 50	2.5	less than 50

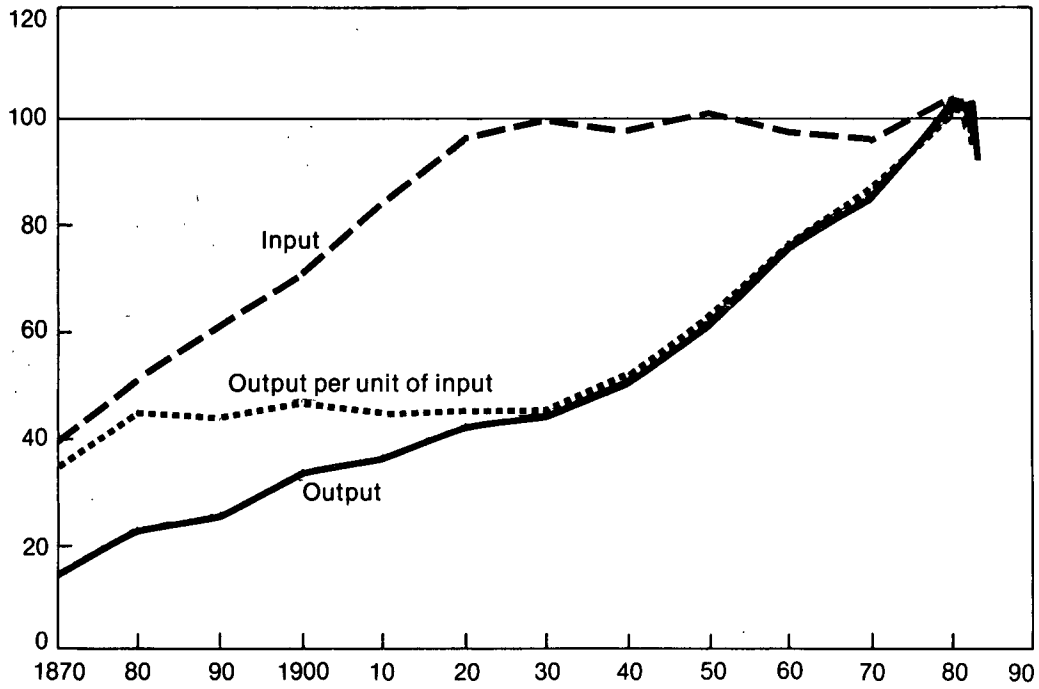
-- = Not available.

Sources: U.S. Bureau of the Census, Census of Agriculture, 1969 and 1982.

Figure 2

### Farm productivity

% of 1977

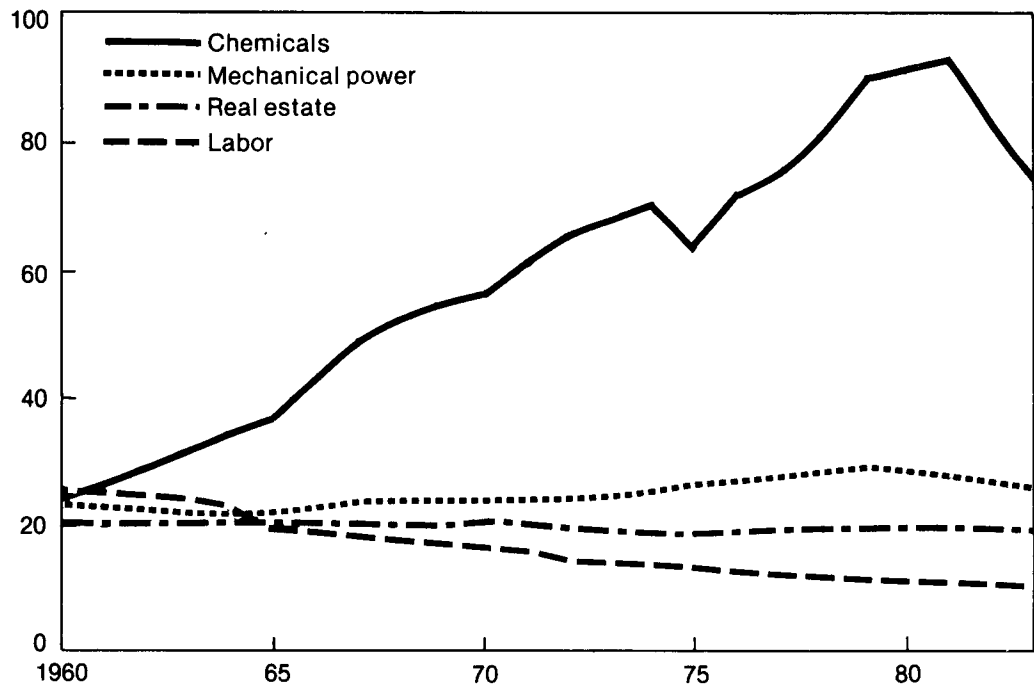


1983 preliminary.

Figure 3

### Changing mix of inputs used in farm production

Billion 1977 dollars



a single or a few commodities, made traditional size family farms too small to fully employ a farm operator family. The low net income of these farms provided a strong incentive for their owners to adjust. In the fifties and sixties, this seemed to be an incentive to "get bigger or get out." In the seventies and eighties, by contrast, the farmer seems to have an incentive to "get bigger or get smaller" (become a part-time farmer) in order to achieve a desired standard of living.

Economies of size have been a source of productivity gains, but the potential contribution of further farm expansion to enhancing productivity is unclear (28, 29). Economies of size arise from:

- o Technical economies--efficiency in use of inputs.
- o Buying economies--quantity discounts and better terms for larger purchases.
- o Marketing economies--higher prices for larger quantities sold and lower unit marketing costs.
- o Tax advantages--nonmarket tax gains for delaying or avoiding taxes on income from any source.
- o Managerial economies--more effective management of risk, hired labor, and other functions.

Empirical estimates of longrun average cost curves for various farm types and sizes based solely on technical economies of size suggest that costs per dollar of gross income consistently decline as small farms expand, then taper off for medium-size farms, and fall very little for large farms. Virtually all technical economies of size inherent in the current technology have already been exploited by family-size crop farms. Although further technological changes will almost certainly continue to hold down food costs, for the typical family farm, financial, tenure, and equity considerations are capable of overshadowing gains due to technical economies of size (13, 14).

Comparing size classes of farms in 1982 with comparable sizes in 1960 summarizes the changes of the period (table 5). The cutoff points between the farm-size categories in 1982 are roughly 4 to 5 times the corresponding sales values of 1960, yet the percentage distributions of numbers of farms and total production are nearly unchanged. Roughly half the farms are noncommercial, rural residences; roughly 5 percent are larger-than-family-sized operations. The noncommercial half of the farms produce only 3 to 5 percent of total output, but the larger-than-family-sized operations have increased their share of total output from one-third to one-half in the last two decades. It took slightly fewer acres of crops to equal the dollar sales of the various size classes in 1982 than in 1960. Forty acres of corn at 1982 yields and prices would put a farm at the \$10,000 break between rural residences and small family farms. In 1960, it would have taken 45 acres to produce \$2,500 worth of corn, the break between the two size categories at that time. In 1982, a family-sized farm would require between 160 and 640 acres of land--if it were all used for crops as intensive as corn. Larger-than-family-sized farms, beginning at about 640 acres, do not necessarily imply large, nonfamily agriculture, but rather multiple-operator or multiple-generation family farms.



Table 5--Profiles of farm size categories, 1960 and 1982

Measure	Rural residences	Small family farms	Family farms	Larger-than-family farms
Sales class:				
1982	:Less than \$10,000	\$10,000-39,999	\$40,000-199,999	\$200,000 and up
1960	:Less than \$2,500	\$2,500- 9,999	\$10,000- 39,999	\$40,000 and up
Percent of farms:				
1982	: 49	23	23	4
1960	: 46	32	19	3
Percent of production:				
1982	: 3	9	39	49
1960	: 5	22	40	33
Approximate cropland used <sup>1/</sup> :				
1982	: up to 40 acres	40 to 160 acres	160 to 640 acres	640 acres and up
1960	: up to 45 acres	45 to 175 acres	175 to 700 acres	700 acres and up
Approximate labor input at most common technology: <sup>2/</sup>				
1982	:up to 5 person-wks.	5-20 person-wks.	20-100 person-wks.	>100 person-wks.
1960	:up to 9 person-wks.	9-36 person-wks.	36-144 person-wks.	>144 person-wks.
Ratio of production expenses to cash receipts:				
1982	: 2.35	1.20	0.96	0.76
1960	: .84	.71	.74	.75
Net farm income per farm:				
1982	: -\$737	-\$121	\$10,100	\$169,402
1960	: 806	2,594	6,030	17,274
Off-farm income per farm:				
1982	: \$19,894	\$15,092	\$10,746	\$16,696
1960	: 2,732	1,706	1,390	2,177
Assets per farm:				
1982	: \$134,493	\$313,372	\$791,174	\$2,337,491
1960	: 18,600	40,000	105,000	260,000

<sup>1/</sup> Approximate acres of corn, at yields and prices of the day, that would be required to provide gross sales equal to sales cutoff points of size category: 1982 = 109 bu./acre @\$2.10, 1960 = 54 bu./acre @\$1.05.

<sup>2/</sup> Approximate labor input required to produce the acreage of corn required in footnote 1, assuming common field crop technology of the day.

Most striking is the decline in labor inputs required by a crop farm in each of the size categories. Owing to more mechanization, the introduction of pesticides and herbicides, increasing yields from new varieties, and higher rates of fertilization, the amount of labor that would be required to be in the rural residence category dropped from 9 weeks to 5 weeks. Similarly, the labor required by a corn farm at the cutoff point between family-sized farms and larger-than-family-sized farms was 144 weeks in 1960, but only 100 weeks in 1982. This fact alone helps explain the squeeze on the incomes of operators of family-sized farms; comparable-sized farms are putting in less labor now than they did in 1960.

Financial Organization

This section looks at the changes that have taken place in the financial environment of agriculture. Income and its sources, the composition of assets and claims, and the financial strength of the sector are evaluated.

Form of Business Organization

Farm businesses are organized in three principal ways: sole proprietorships, partnerships, and corporations. Sole proprietorships are the simplest and most common form of organization (87 percent of farms in 1978 and in 1982), followed by partnerships (10 percent), and corporations (2 percent in 1978, 3 percent in 1982) (fig. 4). All types are chiefly family organizations: in partnerships, the partners are usually related by blood or marriage and most corporate farms are family-owned and operated (9, 31). Corporations have grown the most, especially in the larger sales classes, both in total numbers and as a proportion of all farms (tables 6 and 7).

Figure 4

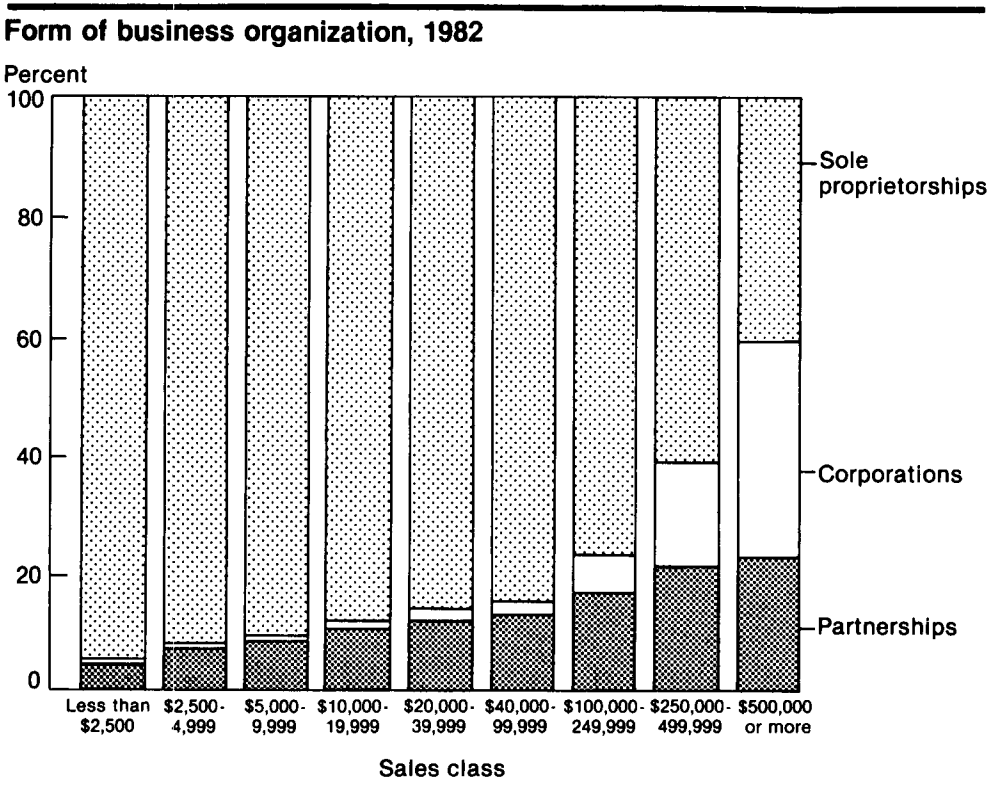


Table 6--Number, land ownership, and value of sales of corporate farms as a percentage of all farms

Item and year	Corporate farms with--	
	10 or fewer shareholders	More than 10 shareholders
	Percent	Percent
Number of farms:		
1974	1.1	0.1
1978	2.0	.1
1982	2.6	.1
Land in farms:		
1974	7.3	2.1
1978	10.1	1.6
1982	11.7	1.9
Sales:		
1974	12.3	5.7
1978	17.4	4.2
1982	19.8	4.1

Sources: U.S. Bureau of the Census, 1974 Census of Agriculture, Vol. IV, Part 5; 1978 Census of Agriculture, Vol. I, Part 51; and 1982 Census of Agriculture, Vol. 1, Part 51.

Table 7--Average income per farm, by type of business organization, 1974 and 1978

Year and type of organization	Net farm income	Off-farm income
	<u>Dollars</u>	
1974:		
Sole proprietorships	7,482	10,193
Partnerships	16,683	11,003
Corporations	65,937	--
Other	23,003	--
All farms	9,303	10,066
1978:		
Sole proprietorships	8,715	12,301
Partnerships	18,283	10,059
Corporations:		
Subchapter S	57,708	--
Other	334,475	--
Other	13,647	--
All farms	10,942	11,790

-- = Not applicable.

Source: Richard W. Simunek and Lise Poirier, "Comparing IRS Farm Data Trends with USDA Measures of Farm Income," Economic Indicators of the Farm Sector. Farm Sector Review, 1982, ECIFS 2-1, Econ. Res. Serv., May 1983.

Federal tax policies probably have had more influence on the conversion of farms to corporate organization than have other Federal policies (1, 7, 15, 20). Corporate tax rates are much lower than individual rates for taxable incomes above \$25,000 to \$35,000 (1). Corporate income tax provisions enable farm corporations to increase equity capital through retained earnings at a faster rate than sole proprietorship or partnerships. Corporate farmers who reinvest a significant portion of farm earnings in the business can still make substantial total tax savings. Further, Federal tax policies encourage certain nontaxable fringe benefits for corporate farmowners. On the other hand, Social Security taxes are higher on the salaries of incorporated farmers than unincorporated farmers.

### Tenure

Some farm operators own all their land, some rent all of theirs, and others own some and rent the rest. The full tenancy rate declined noticeably from the thirties to the late sixties and has remained constant at about 11 percent since then. Land rented by farm operators from nonoperator landlords has increased. As a percentage of total land in farms, rented farmland dropped from 45 percent in 1935 to 37 percent in 1969 and has remained relatively constant since then.

Farms in the lower sales classes are overwhelmingly full owners--70 percent of those in the rural residence category--while only 11 percent are full tenants and 19 percent are part owners. Among family-size farms, 60 percent are part owners, 27 percent are full owners, and 12 percent are full tenants. Larger-than-family-size farms have a slightly higher proportion of full ownership, 33 percent, and slightly lower proportions of full tenancy, 10 percent, and part ownership, 57 percent.

### Current Income

The income of farm operator families, which includes farm-generated income, off-farm income, and Government payments, was below the national median and average family income in 1982, a year that typifies the income situation of the eighties, except for the largest sales classes (fig. 5). Income of farm operator families in the \$200,000-and-over sales classes significantly exceeded the national median family income.

The distribution of income among farm families has become more bimodal due chiefly to the growth of off-farm income in the lower sales classes. Farm operator families on small family farms (\$10,000 to \$39,999) have incomes below the U.S. median family income in most years. They are too small to generate favorable incomes exclusively by farming but too large to allow full-time off-farm employment. Incomes of operator families in the \$40,000 to \$199,999 sales class were unusually low in 1982 because of low prices of farm products and continued inflation in farm input and operating costs.

Larger farms account for an increasing share of farm-generated income. 1/ Farms with \$40,000 or more in sales accounted for 28 percent of farms and virtually all of the farm-generated net income from 1980 through 1982. Farms with sales of

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1/ 1982 was chosen for this analysis because it is the most recent near-normal year. The payment-in-kind program significantly distorted 1983 income sources, especially Government payments and inventory changes.

less than \$40,000 (61 percent of farms, mostly rural residences) had negative farm-generated income in 1982.

Off-farm income raised the average of all farmers above the national median family income and constituted 67 percent of all 1982 income of farm operator families.

Direct Government payments in 1982 amounted to almost \$3.5 billion, 6 percent of the current income of farm operator families. Since direct commodity payments are made on the basis of volume of production, the larger sales classes received most Government payments. However, the concentration of farms producing fruit, vegetable, and animal products which do not receive direct commodity payments means that direct Government payments were distributed differently than cash receipts in 1982:

	<u>Percent of cash receipts</u>	<u>Percent of direct Government payments</u>
Larger-than-family farms	49.1	22.3
Family farms	38.5	56.1
Small family farms	9.2	14.5
Rural residences	3.2	7.2

Note, however, that indirect benefits received through the market from support programs, market orders, and other programs are reflected in cash receipts, rather than Government payments.

Figure 5

### Average farm family income, 1982

Thousand dollars

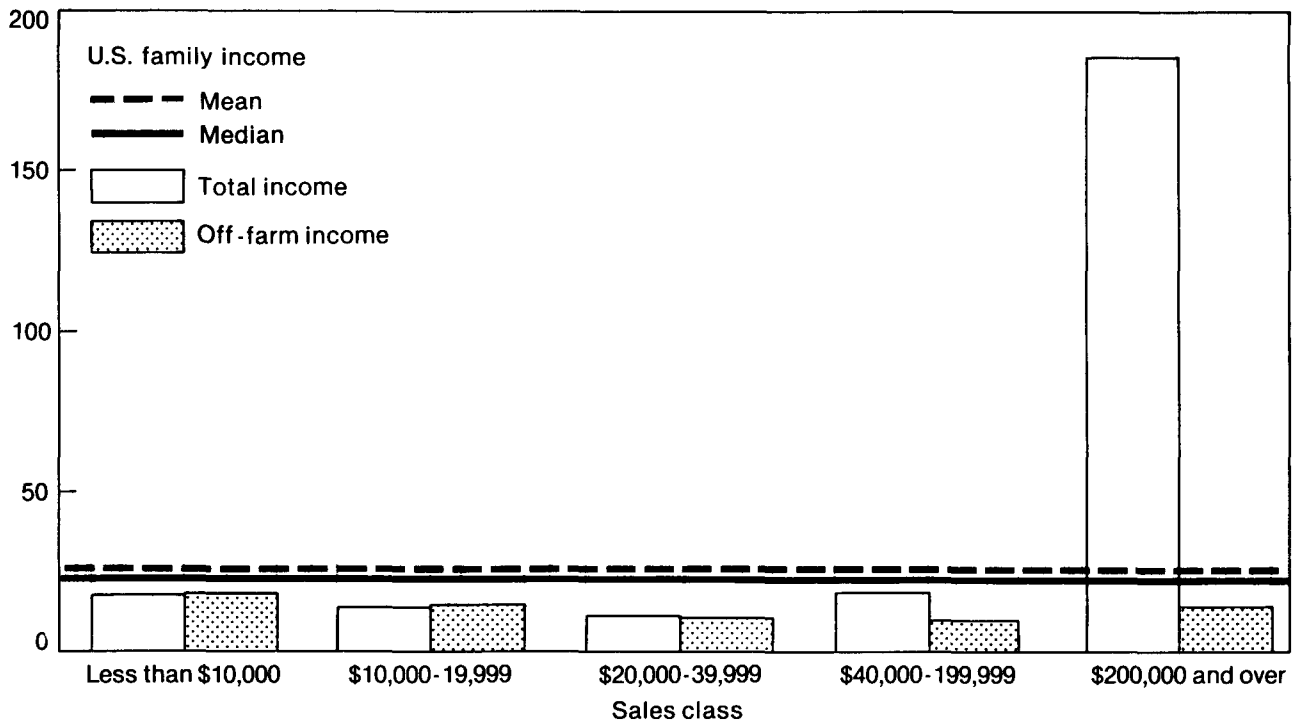
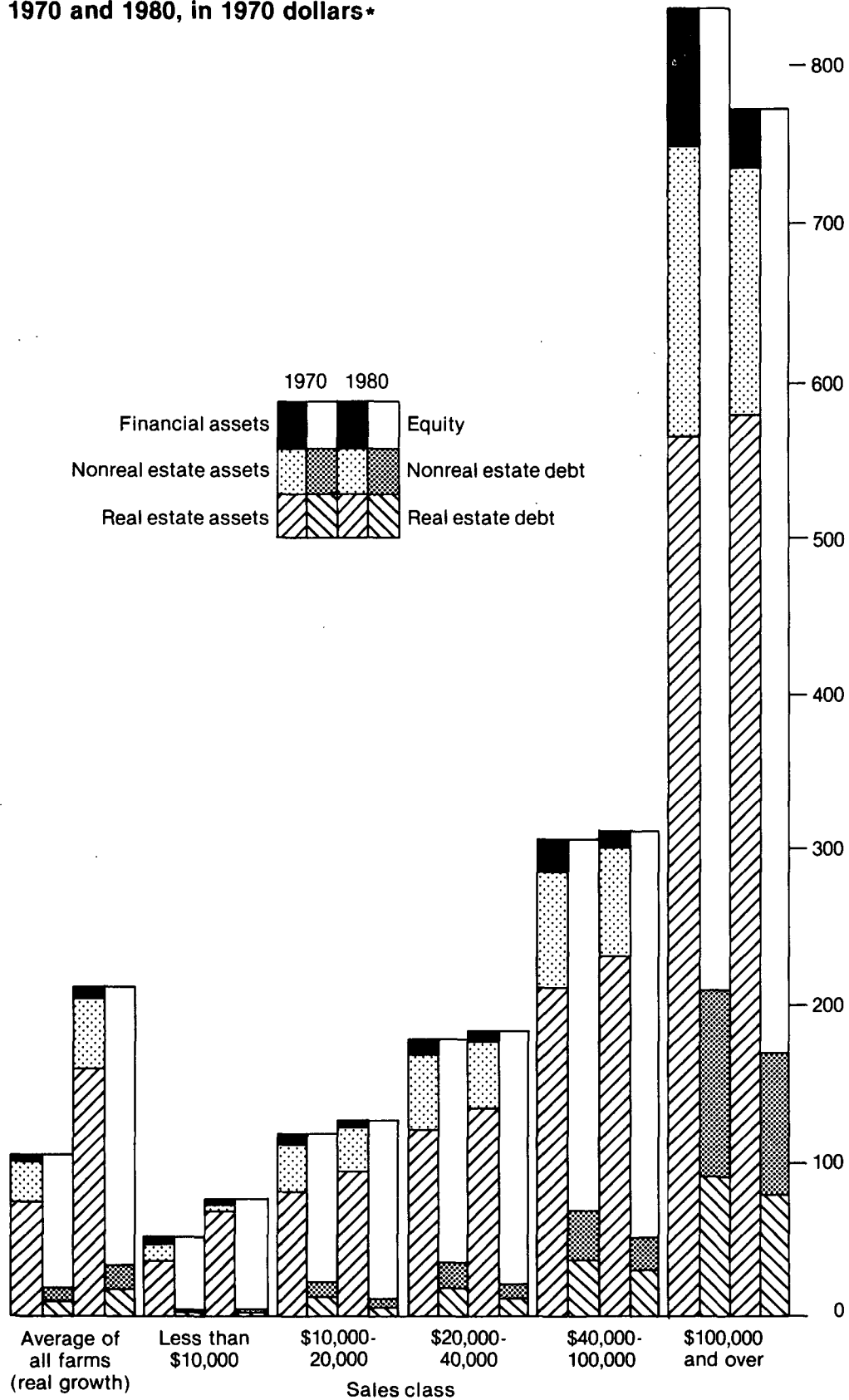




Figure 6

**Balance sheet of farms by sales class,  
1970 and 1980, in 1970 dollars\***

Thousand dollars per farm



\* 1980 converted by using GNP implicit deflator (includes farm households).

Capital gains have been extremely important in the growth of wealth of farm operators. In the seventies, capital gains were positive and at least four times as great as net farm income for all but 3 years. Nominal capital gains, although largely unrealized, exceeded realized net farm income for every sales class in 1980--as was the case throughout most of the seventies. In fact, pursuit of such capital gains may have induced farmers to expand and use credit more than was prudent in the seventies. Nominal capital gains to the farm sector were negative in 1981-82 and small in 1983, as declining real estate values resulted in capital losses in some areas. However, just as capital gains usually remain unrealized, so do capital losses unless a farm experiences such severe cash flow problems and declining equity levels that liquidation or bankruptcy occurs. The most highly leveraged farms--those that recently expanded or that used a lot of their equity to cover past cash flow losses--are the first to feel the stress of declining rates of capital appreciation or, more severely, lower values of farm assets (see also 27).

### Financial Strength of the Farm Sector

As of January 1, 1984, farms in the highest sales category had the highest debt/asset ratios and farms in the lowest sales classes the lowest ratios. Farmers with debt/asset ratios above approximately 40 percent generally must delay or refinance debts when faced with a year of unfavorable income. Thus, a few years of poor returns, badly spaced, as have occurred since 1980, can bring even a reasonably well-established farm with 60 percent equity and 40 percent debt to forced liquidation.

A relatively high proportion of farms in the family farm and larger-than-family farm categories have debt/asset ratios above 40 percent, which many financial analysts consider a danger point. Over 20 percent of the family farms have debt/asset ratios in excess of 40 percent. Nine to 15 percent of the farms with sales greater than \$50,000 have debt/asset ratios of 70 percent or more, which analysts view as the extreme vulnerability zone (fig. 7).

The farm sector is subject to extreme variability of net income with attendant cash flow problems (fig. 8). Low and variable realized returns and high, fixed interest payments contribute to financial instability of the sector. In short, the farm sector is becoming increasingly prone to "boom or bust" cash flow situations. Without some form of cash flow stabilization or diversification of income sources, farms will be able to support only modest debt/asset ratios. This also is due, in part, to the strong reliance on the sole proprietorship form of organization as opposed to partnerships or corporate forms. The latter can seek new equity sources for expansion rather than rely totally on debt financing.

The resulting restrictions on debt acquisition could inhibit the ability of farms to make capital investments in improved technology or adopt specialized, capital-intensive, cost-reducing production methods. This financial instability influences the patterns of farm consolidation in the sector. Acquiring additional farmland would place most medium-sized farms in highly vulnerable, leveraged positions. But large, well-established farms have the financial means to absorb other farms or large tracts of land; and small farms can purchase small tracts because of their off-farm income, without such vulnerability. Thus, midsize fulltime farms are at a disadvantage to both small and large farms in acquiring additional land.



Figure 7

**Farm operators with high debt/asset ratios by sales class, 1984**

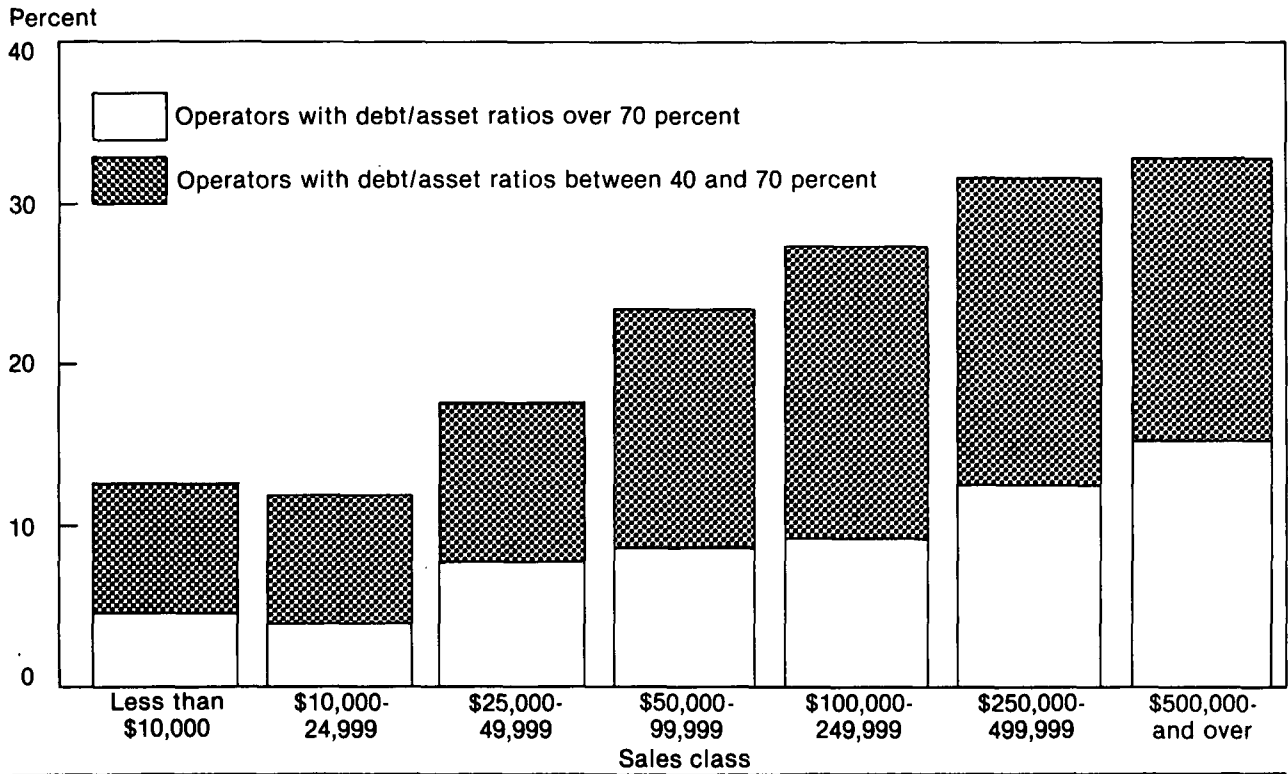
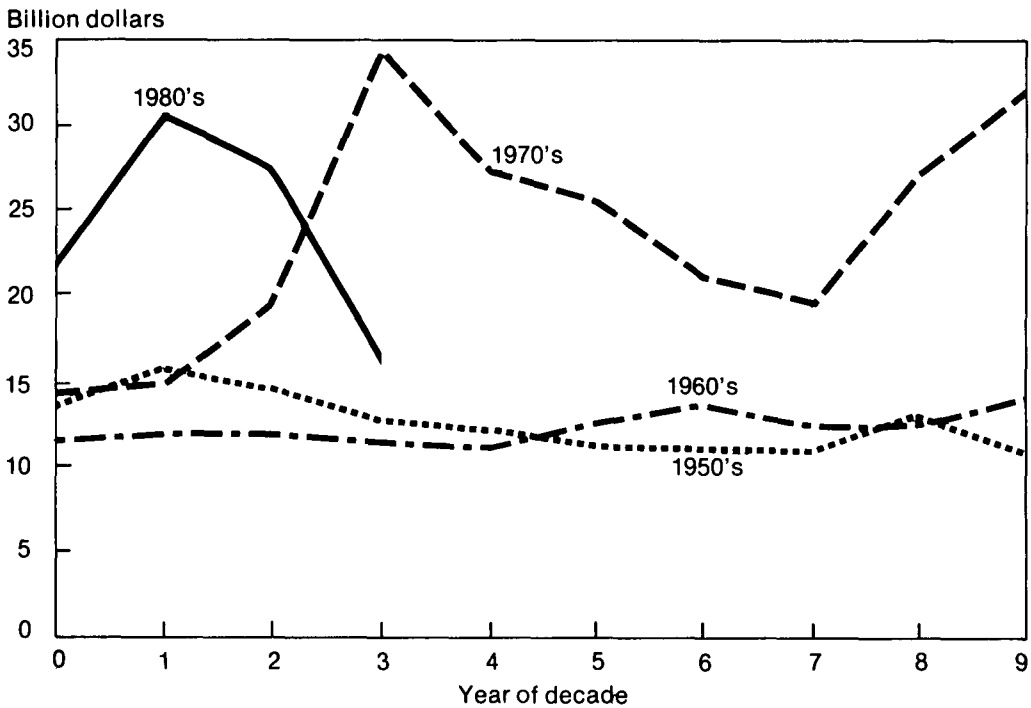


Figure 8

**Instability of net farm income over three decades**



Farm income after inventory adjustment.

## INSTITUTIONAL ENVIRONMENT

The farm sector operates in a unique economic and institutional environment, which has led to a number of public policies aimed at altering its performance in the face of the environment. The farm sector is composed almost entirely of owner-operator farms that are price-takers, with a high proportion of their assets in the form of land, operating in unstable markets characterized by inelastic domestic demands and uncontrollable fluctuations in exports.

### Competitive Unstable Markets

Since individual farmers are price-takers, they have quickly adopted new, cost-reducing or output-increasing technologies of production, storage, and marketing to increase profit margins. Early adopters of a technology derive only temporary benefits from it. The cost-reducing technology results in an increased total supply of the products affected, driving down prices and profits of the early adopters to the new cost levels and forcing late adopters to use the new technology merely to stay in business. Because of this technological treadmill, the sector has had to be progressive and efficient and the benefits of technological advances and productivity increases have been passed on to consumers of farm products, who--as taxpayers--financed much of the research behind those changes (6, 24, 35). (See the article on emerging technologies elsewhere in this report).

After remaining relatively stable through the fifties and sixties, net farm income gyrated widely in the seventies and early eighties (see fig. 8). Prices received and personal income of the farm population are more variable and cash receipts a little less variable. Net farm income changed from one of the most stable portions of farmers' personal income to one of the most unstable elements. Instability of incomes in agriculture stems from many sources, all important.

### Domestic Demand

Farming, being biologically based, is subject to yield and production variability caused by weather, disease, and natural hazards. For example, national average yields and total production of corn dropped by almost 20 percent between 1979 and 1980. And because domestic markets for agricultural products have inelastic demands, total income to producers of a commodity can be severely depressed by bumper crops while a partial crop failure can raise receipts sharply. Increases in supplies result in even greater decreases in prices, causing total incomes to fall. The opposite happens if production falls short. As a result, current income to the farm sector can be very volatile from year to year. Over a period of several years, however, the responsiveness of the farm sector--in increasing the supplies of products that show shortrun profits--causes reductions in all commodity prices and increases in factor prices (primarily land) to levels that just cover the costs of maintaining the resources in production (12).

### Global Uncertainties

World demand for U.S. agricultural products is highly variable due to both global production and the trade practices and policies of large international customers. Also, some foreign customers are marginal or occasional participants in the world market. That is, exports and imports depend a great deal on the size of their current crops, making the United States the residual source of supply to the rest of the world. In the three decades from 1950 to 1980, exports

increased from 5 percent to 18 percent of gross farm output. For some important agricultural exports, up to 60 percent of the world's exportable supplies have been produced in the United States in recent years. Exports have taken as much as 70 percent of U.S. production for wheat and 50 percent for soybeans. International markets are thin, volatile, and subject to the vagaries of weather, international politics, and currency exchange relationships. World grain production did not deviate more than 5 percent from trend in 1972/73, but this shortfall, exacerbated by the policies of many of our trading partners, resulted in large commodity price increases and sharply increased farm income and U.S. agricultural trade grew at rates exceeding 8 percent per year throughout the balance of the seventies.

While expanded markets for U.S. farm products have contributed to growth in the farm sector, they have also contributed to the instability of agricultural markets. U.S. crop and livestock producers and consumers have absorbed most of the costs of the resulting variability. The variability of net farm income was about twice as great in the seventies and early eighties as in the fifties. The sensitivity of international markets to changes in currency exchange relationships is underscored by the fact that in 1982 the realized dollar value of U.S. agricultural exports declined even though foreign buyers paid more in their own currencies than they did in 1981. The strengthening of the dollar in international exchange is related to the current high interest rates that accompany efforts to fight inflation through monetary policy.

Variability of net returns stemming from production, demand, and cost variation is only part of the problem. Concurrent changes in the economic environment and the inflationary expectations of investors in farmland have amplified the problem of instability. In the seventies and early eighties, several changes in the economic setting of agriculture occurred--largely linked to inflation in the general economy and to the value of the dollar in international exchange.

The real-world combination of institutional factors--inflation, capital gains treatment of certain types of farm receipts, cash accounting, and abundant credit at favorable terms--caused the realized cash income portion of returns to shrink and the unrealized capital gains portion of returns to expand during the seventies. By contrast, inflation caused the actual cash expenditures portion of costs to increase and the opportunity costs portion to shrink, because opportunity costs are partially or completely offset by capital gains return to assets (11). By the midseventies, farmers and investors in farmland felt that they could benefit from continuing inflation by aggressive investment in farmland (10).

#### Changing Farm Returns and Asset Values

Most farm assets--73 percent on January 1, 1985--are in the form of real estate, chiefly farmland. This farmland is valued mostly by its expected return from continued use in farming (2). It is physically and economically impossible for most farmland to be converted to nonfarm use within any short period, except where urban or industrial development may be taking place.

The value of farmland adjusted to the conditions of the seventies as farmers and investors in farmland came to view it as a superior hedge against inflation. Also, by the midseventies, land had become analogous to a growth stock (27). The inflation-hedge motive attracted more nonfarm investors to the land market and induced more farmland owners to hold onto their investments. The former led to a

higher demand for land and the latter to a lower supply of land offered for sale; the combination of the two raised the price of land much faster than the inflation rate throughout the seventies. And, farmers and investors were led by a long history of favorable capital gains on land investments to acquire more land and use more financial leverage.

The growth-stock characteristic of land is that its value increases because of expected future increases in returns to land ownership, exceeding that justified by current income alone. Investors in farmland, like investors in any growth stock, must be prepared to experience negative cash flows for several years. Thus, investors, farm or nonfarm, had to subsidize their land purchases from either previously owned farmland for which the net cash flow was positive or from off-farm income sources.

Given the above, the value of farmland largely reflects the expected returns (both cash returns and capital gains) from continued agricultural use of the land (27). These expectations are frequently conditioned by long-term return factors that may be unrelated to the current year's cash return to farm assets. As a consequence, owner-operators of farms are frequently caught between a cash outflow that reflects the longrun expected value of farmland and a cash inflow that reflects temporarily reduced income.

The land market is a thin market--only about 3 percent of farmland changes ownership in any year. Also, all farmland is valued on the basis of the few arm's-length sales that do occur each year. In years of favorable incomes or expectations, land prices are likely to be high; in the face of low incomes or expectations (that is, forced sales), the land market is likely to be severely depressed.

One would expect sharp declines in farmland values if expectations for future growth of farm returns were even to level off. As with any growth stock, when growth expectations decline or even taper off, its price must fall. The trend of increasing land values has changed, at least temporarily. In early 1985, the price of farmland was more than 30 percent below its 1980-81 peak and continuing to decline in many States. Land values could be expected to stabilize and begin to increase modestly if real interest rates and the value of the dollar in international exchange were to decline.

## POLICY RESPONSES

The various commodity subsectors have reacted differently to the economic and institutional framework of the agricultural sector.

### Commodity Policies

Producers of grains and fibers have obtained governmental stabilization and support of their prices through commodity programs providing target prices, loans, and storage facilities and payments (17, 18, 23, 30). These commodity price support programs have tended to increase the value of cropland, both by increasing the expected returns from production and from reducing their variability--especially on the down side.

Producers of fresh fruits and vegetables have reacted to intraseasonal as well as interseasonal instability of prices and to disparities in bargaining power

between producers and handlers by seeking Government authority to partially regulate markets under marketing orders (16, 36, 37). Marketing orders with supply or product quality regulatory powers have increased the stability of returns, but many have not increased the longrun level of returns over what they otherwise would have been (16, 36).

Producers of processing vegetables have utilized negotiated production contracts to manage their risks and processors have used these contracts to assure timing, quality, and quantities of raw-product supplies (33). They receive some assistance through Government purchase of their products under Section 32.

Dairy farmers have obtained rigid import quotas, marketing orders, and Government support of prices to reduce the risks of cyclically unstable prices as dairy herds expand or contract. Since the national dairy herd can be expanded only by raising heifers to 24-27 months of age, milk prices could be depressed or elevated for long periods before the industry could adjust to bring supply and demand into balance (26). These programs have both increased milk supplies and increased the value of dairy production assets above what they would otherwise be.

Cattle producers have been subject to cyclical expansion and liquidation of beef herds for the last 50 years. The beef subsector has not resorted to Government assistance except import quotas and purchases of ground beef under Section 32. Instead, beef producers have used various market means to spread their risks: hedging on futures markets, spreading ownership of cattle on feed among many nonfarm investors through custom feeding, and more recently, increased contracting (33).

Poultry producers do not have Government programs to stabilize prices except purchases of canned chicken (mostly spent laying hens), turkey, and processed eggs. Consumers have benefitted from the technological and structural changes in the poultry industry--real prices of eggs and poultry meat have declined by over 75 percent since 1950. The broiler subsector is the classic case of private sector adjustment to risk (8, 33). It is almost entirely vertically integrated, with broilers owned by an individual firm (the integrator) all the way from hatchery flock to supermarket loading platform. In the grow-out phase, farm operators contract their labor and facilities to integrators and raise broilers for a contractual margin. Eggs and turkeys are not as integrated, but their organization is still highly industrialized and coordinated through contract as well as ownership integration.

Dairy farming is the least concentrated of all livestock enterprises, with the highest proportion of family-sized farms except for hog farming, where disease problems prevented the development of large specialized enterprises until recently. The stability provided by the dairy price support program is a major contributor to this lack of concentration of production. Note, however, that the real price of dairy products has not fallen the way that real prices of poultry products have. Removal of dairy supports would create pressures toward large-scale organization in dairy farming, along the lines of California and Florida dry-lot dairies, rather than the smaller landbased farms of Wisconsin and New York (5).

In beef cattle feeding and broiler, turkey, and egg production, the need to develop new ways to deal with substantial risks has led either to large-scale

units, as in cattle feeding, or contractual integration, or both, as in poultry production.

A part of the adjustment to variable prices and incomes has been to move toward large-scale units--as in eggs, turkeys, fed cattle, and potatoes--which can better spread risk through marketing and financing of production.

### Tax Policies

Tax policies have made farming an attractive investment for farm operators and many others (37). Table 9 shows that large farm losses are strongly correlated with large off-farm incomes, indicating a use of farm assets as tax shelters. The tax-sheltering possibilities of farm assets have raised the capital barriers to entry facing new owner-operators by:

- o Making current cash income and expenditures a downward-biased indicator of economic returns in agriculture.
- o Inflating asset values by their expected return as possible tax shelters, further depressing the apparent rates of return based on cash income and expenditures.
- o Stimulating more investment in farm assets than would otherwise be warranted, which leads to overproduction of farm products, lower farm prices, and lower rates of return from the market.
- o Encouraging farmers' investments in assets with lower effective tax rates. Since there are wide differences in effective tax rates between various classes of farm equipment and structures, investments tend to be concentrated where the tax treatment is most favorable rather than where they are economically most efficient.
- o Fostering ownership of farm assets with tax-sheltering possibilities by those who can best reap the benefits of the tax treatment of these assets. Overall rates of return remain nearly the same, but more return is realized from tax sheltering and less from the market (15).

Estate and inheritance tax policies and rules governing incorporation also influence the organization of agriculture. Several provisions of estate and gift taxes--Federal taxes on wealth transferred during life or at death--can affect the ownership of farms and the maintenance and accumulation of wealth across generations, encouraging agriculture as a potential estate tax shelter as well. Among the most important are special use valuation of farm assets and deferred payment of estate taxes. Special use valuation, within certain limits, allows farm assets to be valued on the basis of the prevailing rental rates for these assets capitalized at the Federal Land Bank interest rate. This method of valuing agricultural assets ignores several components that contribute to the fair market value of farmland: its inflation-hedging, growth-stock, and tax sheltering potentials. These components contribute up to 50 percent of the market value of farmland in some areas and at some times (7).

Deferred payment of estate taxes, with favorable interest rates on the first million dollars of taxable estate values, provides heirs with valuable financing breaks. Access to these provisions is focused toward farmers by requiring material participation and qualified use tests for eligibility (7, 21). Other

institutional rules surrounding incorporation of farms, provision of fringe benefits, and liabilities for certain employment taxes, such as workers' compensation, provide significant means for farms to obtain favored tax positions (20).

### ISSUES FACING FARMERS, THE INDUSTRY, AND SOCIETY

Organizational change issues of the farm sector can be viewed from three vantage points: those of farmers, agriculture as an industry, and society, on whose behalf public policies are formulated.

#### Farm Firm Issues

Farmers' problems are very concrete and revolve around how to enter farming, how to survive and grow, and how to pass the farm on to the next generation. Entry is made difficult by high and rising capital requirements. Rapid inflation in the seventies also created barriers to entry by stimulating even more rapid

Table 9--IRS-reported farm and off-farm income, by individuals reporting farm profits and losses, per farm, 1976

Item	Number of returns	Adjusted gross income	Farm income or loss	Off-farm income
	Thousands		Dollars	
<b>Farm profits:</b>				
\$50,000 or more	17	81,673	74,911	8,706
\$25,000 to \$49,999	81	37,671	32,979	5,684
\$10,000 to \$24,999	231	21,196	15,624	6,110
\$5,000 to \$9,999	210	13,291	7,178	6,507
\$2,000 to \$4,999	252	11,027	3,233	8,226
\$1,000 to \$1,999	179	9,872	1,441	9,148
\$1 to \$999	358	10,512	397	10,851
All farms with profits:	1,328	15,366	7,716	8,245
<b>Farm losses:</b>				
\$50,000 or more	12	16,362	-104,448	122,080
\$25,000 to \$49,999	24	17,366	-33,942	51,602
\$10,000 to \$24,999	93	15,423	-15,154	32,348
\$5,000 to \$9,999	191	13,571	-6,836	20,641
\$3,000 to \$4,999	228	13,638	-3,842	18,151
\$1 to \$2,999	917	13,329	-1,184	14,864
All farms with losses:	1,465	13,631	-4,568	18,669
All individuals	2,793	14,533	1,268	13,877

Source: (33), p. 84.

increase in farmland values (10, 31). A slowdown in inflation reduced farmland values during the eighties, but the long-term future trend is unclear.

Farm survival and growth are as much a matter of financial management as production or marketing management. The rapid increase in farm asset values in the seventies followed by the shocks of the early eighties established financial strategy as a key to farm growth and survival and demonstrated that a financial strategy that spells success in one economic environment can spell disaster in another. Farmers' financial growth and survival decisions center around:

- o Adjusting to the economic instability of the agricultural sector--balancing income streams; utilizing public and private sector means to handle risks.
- o Adjusting to the disparity between cash flows and economic returns--balancing returns from current net income and capital gains; balancing equity and credit financing to achieve growth and security.
- o Adjusting to farm and nonfarm opportunities for investment and employment--balancing farm and nonfarm income sources and investments.

These financial decisions are superimposed upon day-to-day production and marketing decisions, and may be of equal or greater importance.

The third problem from the farmer's point of view is passing the farm on to the next generation--whether within the family or to a new entrant. Concern centers upon estate taxes, but most farms except the multiple-operator, larger-than-family farms can be passed to a qualified heir without being subject to a heavy estate tax burden under current Federal law. A potentially more important problem is that of equitably sharing the estate (or the proceeds from operating it) among many nonfarm heirs. Farming and farmland ownership have traditionally returned low rates of current return and high rates of capital gains, so it is difficult for the farm-operating heirs to buy out the nonfarm heirs; but it is equally difficult for the nonfarm heirs to receive a fair share of returns without selling the land to realize the capital gains.

#### Industry Issues

From an industry perspective, the "one-farm, one-owner, one-operator," low-debt model of agriculture is no longer strictly applicable to farming. This type of organization dominates small farms and rural residences, but among family farms and larger farms it is becoming less true (see business organization, fig. 4; tenure, p. 36; and debt, fig. 7). With the decline of full ownership and the increased use of credit, the sector has lost some of its resilience and flexibility because every factor--land, labor, capital, management, and riskbearing--must be rewarded every year. This is far different and far less flexible than the situation of an owner-operator able to allocate an undivided margin above shortrun variable costs to the most pressing needs in any year. Decreased flexibility makes the industry less able to absorb economic or natural shocks. Its ability to cope with instability is weakened at just the time that the magnitudes and probabilities of external shocks have increased. The increased use of credit is currently the most serious of these problems.



## Issues Facing Society

In an endeavor to achieve certain goals of society with respect to agriculture, such as food safety, security, abundance, and reasonable prices, policymakers face several problems. The first is that organizational change usually has been viewed as an unintended side-effect of policies designed to accomplish other ends. The United States has not had an overt farm-size policy at least since the Homestead Act. Certain programs such as land reclamation, commodity support payments, or lender-of-last-resort programs have had size limitations, but most policies are not intended to affect organization any differently than would an unassisted free market. While the intention has seemed clear, the realization has not been. Unintended organizational side-effects of policy have abounded and have been described since the thirties.

Historically, agricultural policies and programs were seen as needed to assist a chronically depressed and chronically unstable sector of the economy. They were designed accordingly, to stabilize prices and improve incomes. Programs aimed at increasing the income or wealth of farmers should address the question of whether farmers are, in fact, a disadvantaged group in society or would be, without the programs. Programs aimed at mitigating instability should be justified by the improved welfare or efficiency of a more stable industry as opposed to a less stable one.

Most farm programs distribute direct payments and benefits on the basis of output and confer indirect benefits by raising prices in the marketplace; thus both direct and indirect benefits are proportional to volume. Farm program benefits go heavily to the larger-than-family farms, which account for nearly half of production and have current incomes and net worth that are clearly above the average of the U.S. population. It has become increasingly hard to justify agricultural programs that transfer income on the basis of production volume alone, despite objectives to promote stability. Moreover, it is becoming increasingly evident that farm programs administered without due regard for the importance of nonagricultural factors will be insufficient to address the income and stability needs of a diverse U.S. farm sector.

One general relationship appears clear: While public policies may help the current group of family farms to survive, they may also hinder the long-term survival of family farming as a system. By establishing policies that are applicable to all types of ownership and operating units in farming, policies which create a favorable environment for family farms may also attract other types of farm organization, inviting nontraditional investors and new forms of farm business organizations to enter the industry. Thus, the policies may inadvertently preserve the family farm in a disadvantageous position, and may perpetuate the need for Government support.

Nevertheless, some elements of programs appear to contribute primarily to reducing price, production, and resource instability: the farmer-owned reserve for grains, nonrecourse loans at or near world price levels, crop insurance, lender-of-last-resort and economic emergency lending programs, or marketing orders for fruits, vegetables, and milk. Other elements contribute primarily to increasing the income or wealth of farmers through taxpayer transfers (such as target price programs, direct costs of dairy support purchases, and credit at subsidized rates) or at consumers' expense (such as the indirect costs of dairy support purchases, or tobacco and peanut quotas). The total budgetary costs for

income transfer programs greatly exceed the costs of programs aimed at controlling or coping with instability in agricultural markets.

#### SUMMARY

Major changes in the organization of farming since World War II have called into question the rationale for farm programs used since the thirties. In the depths of the Depression, the decision was made to help all farmers without regard to their size by raising prices through restrictions on production. The need for more stability was also recognized; however, the emphasis was on income enhancement from Depression levels.

In the sixties and seventies, deficiency payments (direct payments to farmers) were introduced to partially separate income enhancement from price enhancement. Deficiency payments, based on volume of production, help large farmers more than smaller farmers.

The evidence points overwhelmingly to major changes in the physical, financial, and institutional organization of farming since World War II. Farm numbers declined until the late seventies and number 2.3 million today. The concentration of production has increased sharply. The largest 5 percent of farms produce 50 percent of output in the eighties compared to 42 percent in 1960. The share of sales by farms with sales of \$500,000 or more doubled from 15 percent in 1960 to 30 percent in the eighties.

The decline in farm numbers is almost entirely among those with sales of less than \$40,000 per year. The smallest farms have become mostly rural residences with substantial off-farm income offsetting paper or tax losses on minor farming operations. The tax-sheltering possibilities of farm assets have made it more difficult for new people to enter farming and have put more emphasis on tax treatment of assets than on making the most efficient investment.

Changes in technology and specialization of production have encouraged the formation of very large, highly capitalized farms, and very small, part-time farms. This has left the middle of the size distribution--small family farms--too large to allow full-time, off-farm employment and too small to yield an adequate income from farming.

With increasing mechanization, farms must be larger to fully employ farmers and their families--up to 80 percent larger in 1982 than in 1960. This created pressure for farms to grow larger and drove up land prices in the sixties and seventies.

Farmers made substantial paper returns from the increasing value of farmland, providing a basis for loans to buy more farmland and newer machinery, and for farm operation. In the eighties, farmland values have fallen at a time when need for credit has increased for many farmers. As farmers borrow more and their cushion of equity decreases, they are increasingly vulnerable to income swings. Over 30 percent of farms with sales between \$50,000 and \$500,000 have debt/asset ratios in excess of 40 percent which could bring them to the point of forced liquidation with a few years of poor returns. Nearly 14 percent of these farms with sales of over \$50,000 have debt/asset ratios in the extreme danger zone of 70 percent or more, as of January 1985.

Farm income was quite stable in the fifties and sixties, but since 1972 it has been extremely variable. A substantial portion of the underlying instability arises from natural variation in production, much of it weather-related. Another substantial and increasingly important portion is due to increased reliance on export markets for crops. The demand for U.S. agricultural products in the rest of the world is highly variable, especially when large international customers alter their trade practices and policies. Instability is much greater than it was in the fifties and sixties; the role of public programs in providing a measure of income stability is a more important continuing rationale for public farm programs than is low incomes among farm operators.

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