DOCUMENT RESUME

ED 272 762 CE 044 898

AUTHOR Ahearn, Mary
TITLE Financial Well-Being of Farm Operators and Their Households. Agricultural Economic Report Number 563.
INSTITUTION Economic Research Service (DOA), Washington, D.C.
PUB DATE Sep 86
NOTE 49p.
AVAILABLE FROM Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Adults; Agricultural Education; *Agricultural Production; *Agriculture; *Farmers; Farm Occupations; *Financial Problems; *Income; Vocational Education

ABSTRACT

Almost one-sixth of all U.S. farming households suffered net income losses in 1984, while about one-ninth had total incomes of more than $60,000. This disparity in a relatively high income year for the agricultural sector as a whole demonstrated the importance of income distribution in determining the overall financial well-being of farm operators and their households. Most of the average farming household's income earned on the farm came in the form of the rental value of farm dwellings, home consumption of farm-produced food, and wages and benefits operators paid themselves and their household. In 1984, about three-fifths of the total income earned by farming households came from off-farm sources. The income gap between farm operator households and nonfarm households had narrowed somewhat over time, but farm operator household incomes were still generally lower. Average incomes tended to mask differences, however, because farm households had a higher proportion of households in both the lowest and highest income group than did nonfarm households. More than two-fifths of all U.S. farms had total annual sales of less than $10,000. Farms in the Delta States had the lowest average incomes in 1984, Pacific States farms the highest. (YLB)

United States Department of Agriculture

Economic Research Service

Agricultural Economic Report Number 563

Financial Well-Being of Farm Operators and Their Households

Mary Ahearn

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FINANCIAL WELL-BEING OF FARM OPERATORS AND THEIR HOUSEHOLDS. By Mary Ahearn, National Economics Division, Economic Research Service, U.S. Department of Agriculture. Agricultural Economic Report No. 563.

ABSTRACT

Almost a sixth of all U.S. farming households suffered net income losses in 1984 while about a ninth had total incomes of more than $60,000. This disparity in a relatively high income year for the agricultural sector as a whole demonstrates the importance of income distribution in determining the overall financial well-being of farm operators and their households. Most of the average farming household's income earned on the farm came in the form of the rental value of farm dwellings, home consumption of farm-produced food, and wages and benefits operators paid themselves and their households. In 1984, about three-fifths of the total income earned by farming households came from off-farm sources.

Keywords: Farm operator households, distribution of income, wealth, Farm Costs and Returns Survey, farm-nonfarm comparison

ACKNOWLEDGMENTS

The author acknowledges the contributions of the many individuals of the Economic Indicators Branch of the National Economics Division, Economic Research Service, and the Data Collection Branch of the Survey Division, National Agricultural Statistics Service, and that agency's State offices and enumerators who contributed to the creation of the 1984 Farm Costs and Returns Survey. The author also gratefully acknowledges the comments of Greg Hanson, Craig Jagger, Jim Johnson, Peggy Ross, and Roger Strickland, the typing skills of Margie Craig and Eric Butts, and the graphics skills of Agnes Chesley and Jackie Ross.

Washington, DC 20005-4788 September 1986

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SUMMARY

Almost a sixth of all U.S. farming households suffered net income losses in 1984 while about a ninth had total incomes of more than $60,000. This disparity in a relatively high income year for the agricultural sector as a whole demonstrates the importance of income distribution in determining the overall financial well-being of farm operators and their households. Most of the average farming household's income earned on the farm came in the form of the rental value of farm dwellings, home consumption of farm-produced food, and wages and benefits operators paid themselves and their households. In 1984, about three-fifths of the total income earned by farming households came from off-farm sources.

The income gap between farm operator households and nonfarm households has narrowed somewhat over time, but farm operator houshold incomes are still generally lower. Average incomes tend to mask differences, however, because farm households have a higher proportion of households in both the lowest and highest income groups than do nonfarm households.

Here is a thumbnail sketch of the economic well-being of farming households in 1984:

- More than two-fifths of all U.S. farms had total annual sales of less than $10,000, accounting for only 2 percent of all farm sales. These farms suffered an overall net loss of income. On average, households on farms with sales of less than $100,000 earned most of their income from off-farm employment. Households on farms with sales of more than $500,000 earned an average $219,000 in income in 1984.

- Farms in the Delta States had the lowest average incomes in 1984; Pacific States farms had the highest. Farming households in the Corn Belt and Northern Plains States earned the largest share of total income on the farm. Farms with net losses were mostly concentrated in the Southern Plains and Northeast States. The Appalachian and Lake States had the lowest proportion of farms with net income losses.

- Households with high average incomes, such as poultry and egg and vegetable and melon producers, tended to be most dependent on farm income. General crop producers and other farming households with low incomes generally depended on off-farm sources of income and tended to have large farm income losses.

- Households with the highest equity in farm real estate, machinery, and inventories were more dependent on farm income than households with the lowest equity. Most dependent on farm income, however, were households between the two extremes.

- Average income generally decreased and the share of income from nonfarm sources generally increased as household's debts increased in relation to assets.

Financial Well-Being of Farm Operators and Their Households

Mary Ahearn*

INTRODUCTION

In the past, farm households experienced lower incomes on average than nonfarm households. The gap between the average income of farm households and nonfarm households has lessened somewhat over time, in large part as a result of the increases in off-farm income. However, an average income of farm households has lost much of its meaning because it masks a great deal of variation among households. Compared with the past, farm households represent a heterogeneous population. This diversity has intensified the challenge to government officials seeking to implement agricultural policies equitably.

This report describes the diversity in the financial well-being of farming households by measuring their size distribution of personal income and farm wealth in 1984, and their income and wealth position in relation to nonfarm households.

CONDITIONS IN THE FARMING SECTOR

Large increases in agricultural productivity and economies of size, particularly since the 1940's, have significantly affected the control and organization of resources in the farming sector. These structural changes include decreases in farm numbers and increases in the average size of farms. In 1910, the Nation's 6.4 million farms averaged 137 acres per farm, with sales of agricultural commodities worth $4,749 (in 1972 dollars, table 1). By 1984, the total number of farms was a third the number in 1910, the average acreage more than tripled to 438 acres, and the real sales per farm increased to $27,270, almost six times the 1910 level.1/

Farms have also become more specialized in production. A farm is said to specialize in production of a commodity if sales of that commodity represent at least 50 percent of its total sales. Specialization has increased both in terms of (1)

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* The author is an agricultural economist in the Economic Indicators Branch, National Economics Division, Economic Research Service.

1/ In contrast to the number of farms, the number of farmland owners has remained relatively stable since 1900 as a result of the increase in the number of non-operator landlords (6). Underscored numbers in parentheses identify references listed at the end of this report.

Table 1--Number of farms, acreage, and sales, 1910-84

Year	Number of farms	Acreage		Sales per farm
		Total	Per farm	
	Thousands	Million acres	Acres	Real 1972 dollars
1910	6,406	872	137	4,749
1920	6,518	956	147	4,528
1930	6,546	987	151	4,357
1940	6,350	1,077	171	4,542
1950	5,648	1,204	213	9,409
1960	3,963	1,166	305	12,493
1970	2,949	1,097	378	18,729
1980	2,433	1,034	425	32,262
1984	2,328	1,020	438	27,270

Source: (15).

the dominance of the specialized commodity in the total sales of that type of specialized farm and (2) the dominance of sales by specialized farms in the total sales of the specialized commodity in the farm sector as a whole (23). In other words, commodities are increasingly being produced on farms which specialize in their production. Moreover, the percentage of sales for a single commodity from these specialized farms has been increasing.

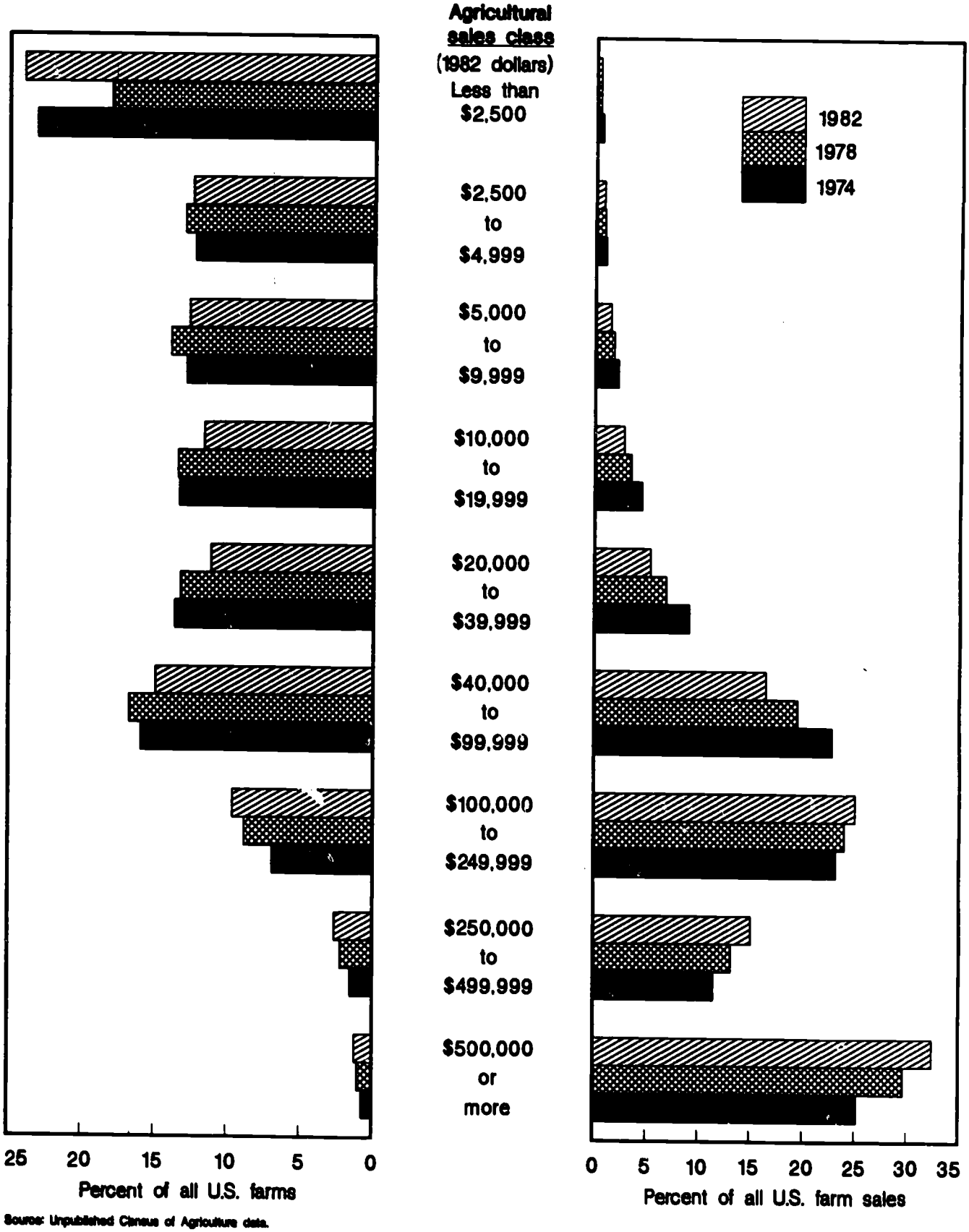
Concurrent with the increases in specialization has been an increase in the concentration of production measured as sales of agricultural commodities. In 1982, the 1.2 percent of farms with sales over $500,000 accounted for about a third of all sales (fig. 1) and about half of all the sector's net farm income (25).2/ Production concentration has increased in real terms even during the short period of 1974-82. But small farms are not becoming extinct. On the contrary, the percentage of small farms (those with sales under $20,000) has remained stable over the period of 1974-82 at around 60 percent of all farms. Small farms account for a disproportionately small share of production and, of late, have lost money in terms of net farm income (25).

During the 1980's, the agricultural production sector has experienced severe financial stress in terms of deteriorating cash-flow positions and declining farm equity. The stress is largely the result of changes in the national economy since the 1970's which had generally been unanticipated. During the 1970's, international demand for grains, livestock feeds, and oilseeds increased at the same time that the value of the U.S. dollar declined. The result was a growth in

2/ Productive capacity as measured by the value of assets is less concentrated than are sales. In 1982, the value of land, buildings, and equipment of the 1.2 percent of farms with the greatest sales amounted to 12 percent of the total value (28).

Figure 1

Distribution of Farms and Sales of Agricultural Commodities, by Agricultural Sales Class, 1974, 1978, and 1982



Source: Unpublished Census of Agriculture data.

the export market for U.S. farm commodities. The inflation rate accelerated during the decade and stimulated investments in inflation-hedging assets, such as farmland. Both accelerating levels of inflation and regulated financial markets resulted in low real interest rates. Use of debt financing by farm operators increased greatly as a result of the low real interest rates, expectations of asset appreciation, and liberalization of credit conditions. Total farm debt more than tripled between 1970 and 1981 as did the nominal value of farm assets.

By the end of the 1970's, favorable conditions reversed for the sector. The rising value of the U.S. dollar, changes in the Federal Reserve Board's interest rate policy, and increased production by competitors shifted both supply and demand for U.S. products and put downward pressure on domestic commodity prices. The value of farm assets has decreased since 1981 as a result of depressed commodity prices, deflated expectations regarding future farmland appreciation, and high real interest rates. However, farm debt has remained relatively stable. The extent of the current financial stress varies significantly across the sector. Aside from recent weather trends, those farm businesses most adversely affected are probably those which produced commodities with a large export market and those which purchased land at the inflated prices of the 1970's, although there is a lack of empirical evidence.

Most farm businesses are closely held by farm households. The economic well-being of households associated with farms varies considerably, largely because of the variation in the financial position of their farms. Another factor affecting the well-being of farm households is their off-farm income. Those for which farming is the principal occupation during an income year are more likely than any other occupation to have more than one job (8). Farm operator households have become increasingly dependent on off-farm sources of income. The U.S. Department of Agriculture (USDA) estimates that 43 percent of the total income of farm operator households came from off-farm sources in 1960, and 54 percent came from off-farm sources in 1984 (25).3/ Off-farm income provides a more stable source of funds for the household. For example, off-farm income has increased only moderately in the 1980's, but it accounted for 72 percent of the total income in 1983 because of the low farm incomes that year.

IDENTIFYING THE PEOPLE ASSOCIATED WITH FARMS

Measuring the financial well-being of people associated with farms has been complicated by the use of more than one definition of the relevant population, sometimes leading to confusion over the populations. The definition employed in this report is farm operators and members of their households. By definition, the farm operator is the primary decisionmaker of the farming operation and generally bears the major financial responsibility.4/ Other definitions of people associated with farms are for farm residents, those who have farm self-employment income, and those whose major occupation is operating or managing a farm.

Farm residents, officially termed the farm population, are simply those persons who reside on farms in rural areas. This group includes resident workers as well as persons not actively associated with farm production. The residence concept

3/ The USDA total income includes nonmoney income.

4/ In the case of partners who equally share decisionmaking responsibility, the more senior partner is classified as the operator.

excludes those who are involved with farm production if they do not reside on farms. In 1982, 21 percent of those operating farms did not reside on their farms (28). The popularity and relative accessibility of this concept can be explained by the fact that most of those benefiting from farm programs in the past resided on farms. For example, in 1970, 77 percent of those self-employed in farming (as operators and nonoperator landlords) and 31 percent of hired workers were farm residents. Just 62 percent of the former and 22 percent of the latter were farm residents in 1982 (5).

Another classification, those who receive farm self-employment income, includes operators and partners of unincorporated farms and unincorporated farm landlords who do not operate a farm and excludes operators of incorporated farms. Although only 3 percent of farms are incorporated, this type of organizational structure accounted for 24 percent of agricultural sales in 1982 and increased in numbers at the fastest rate between the 1978 and 1982 Censuses of Agriculture, 19 percent, compared with -1 percent for sole proprietors and -4 percent for partnerships (28, 30). Persons with farm self-employment income must file a schedule F for tax purposes unless their total income falls below a minimum level.

The final classification of farm people is occupationally based and is defined as the job held longest during the relevant period. The farming occupational category is defined to be composed of farm operators and managers. The definition includes only individuals whose major occupation is farming and excludes operators for whom farming is not the primary occupation. With the growth in off-farm income, excluding operators whose major occupation is not farming is a particularly problematic feature of this comparison of family incomes for policy purposes. In 1982, 45 percent of farms were operated by an operator whose primary occupation was not farming (28). Those farms account for $17.4 billion or 13 percent of the gross sales of farm commodities. Appendix A contains additional information on some general distinctions among the groups of farm people.

METHODOLOGY

There are many ways to view the distribution of income in agriculture. Income distribution is generally analyzed by categories known to be of special interest for policy purposes, such as by the size of farms or by the type of production in which farms specialize. Two approaches for analyzing the distribution of income follow formally from economic theory: (1) the functional distribution and (2) the size distribution of income. The functional distribution measures how income is distributed to the factors of production or inputs. The size distribution of income indicates how income is distributed among the people who control the factors of production.

This report describes how, rather than why, income is distributed to people in agriculture over time and for 1984 by various categories of households and in comparison with nonfarm households. Economic theories for explaining the size distribution of income are not well developed despite much research in the area; this situation reflects the complexity of the process. A theory based on acquired human capital, mainly educational attainment and on-the-job training, currently dominates theories of income distribution. Its basic premise is that the distribution of acquired human capital determines the distribution of earning capacity and income. The life-cycle and inheritance theories highlight the importance of other forms of capital as accumulated through one's lifetime and among generations, respectively. This report will not attempt to empirically explain the size distribution of income. Appendix B provides a brief description of theories of income distribution and how they relate to agriculture.

The approach used to measure the size distribution of income is to report the percentage distribution of income recipient units in each total income class and the Gini index which is an overall measure of income inequality based on the concept of the Lorenz curve. The Lorenz curve is a special case of concentration curves which plots the relationship between the cumulative percentage of total income corresponding to the cumulative percentage of the population when individual units are ranked in ascending order of their income. The geometric interpretation of the Gini index is the area between the Lorenz curve and a diagonal which represents perfect equality of income as a proportion of the total area under the Lorenz curve of perfect equality. If income is distributed perfectly equally, the Lorenz curve will coincide with the diagonal and the Gini index will equal 0. Similarly, if income is distributed perfectly unequally, the Gini index will equal 1. The Gini index has the desirable properties that (1) it is invariant to proportional changes in income and (2) a transfer of income from an individual unit with a higher income level to an individual unit at a lower income level decreases the measure of income inequality. Moreover, since it is the most widely used measure of income inequality, comparisons of inequality among distributions may be facilitated.

SOURCES OF DATA

The primary data for this study were obtained from a national farm operator survey to obtain information on the amount and sources of production expenses, revenues from farm marketings and other farm-related earnings, off-farm earnings, and selected debt and asset data for the farm business. The 1984 Farm Costs and Returns Survey is a personally enumerated, probability-based survey. The sample consists both of farmers chosen from a list of known operators compiled by USDA's National Agricultural Statistics Service (formerly the Statistical Reporting Service) and segments of rural land in which all residents were interviewed to determine if they qualified as farm operators. Of the 23,386 rural residents contacted, 72.8 percent participated in the survey, of which 13,003 yielded usable questionnaires. Because a probability sample of farms was drawn in the survey, each respondent represents a number of other farms of a similar size and type.

DEFINITIONS

The following are the definitions used in this report:

Farms are defined as places having sales of agricultural products of $1,000 or more during the calendar year.

Total income of farm operator households is defined in this report as income from the farm operation and income of the farm operator household from off-farm sources.5/ That is,

Total household income	=	Farm income	+	Off-farm income	(1)

Both farm and off-farm income sources are further disaggregated in this report to better describe the financial character of farm operator households.

5/ For this report, we assume that all farm income is earned by farm operator households.

Farm income is disaggregated into the following components:

- Business farm income measures the contributions made by net returns from agricultural production;
- Household farm income measures the contribution the business makes directly to households; and
- Government payments income measures the direct payments Government makes to the farm business under farm programs.6/ That is,

Farm income	=	Business farm income	+	Household farm income	+	Government payments	(2)

The distinction between business and household farm income exists as a result of the special incentives which exist because most farms are family-run businesses. Farming operations generally incur expenses in producing household farm income and receiving Government payments; these largely inseparable expenses are accounted for in business farm income.

Business farm income, in this report, is defined as income from the production of agricultural commodities, including all cash income, net cash expenses, depreciation, and in-kind benefits to hired labor. However, the definition excludes the value of the change in inventories. That is,

Business farm income	=	Gross cash farm income	-	Cash expenses	-	Depreciation and perquisites to labor	(3)

Household farm income is income the household earns directly from the business and includes an imputed rental value for farm dwellings, the value of agricultural commodities produced and consumed on the farm, and wages and fringe benefits the business pays to the operator household for its labor. That is,

Household farm income	=	Imputed rental value of farm dwellings	+	Home farm consumption	+	Own farm wages and fringes paid to household	(4)

Off-farm income can come from four sources:

- Nonfarm wage and salary income,
- Wage and salary income earned from work on other farms,
- Business and professional income, and
- Money income from all other sources (including nonfarm transfers).

6/ The sum of the three sources of farm income is conceptually similar to the official USDA concept of net farm income except that it excludes the value of the change in inventories. Aside from conceptual differences, estimates in this report will not correspond to the official estimates because of differences in sources of data.

That is,

Off-farm income	=	Nonfarm wage and salary income	+	Wage and salary income from other farms	+	Nonfarm business and professional income	+	Other money income	(5)

Equity, as used in this report, refers only to farm business holdings and excludes nonfarm assets of the household and all financial assets.

Several sources of secondary data are used in this report to show changes in farm operator households' income over time and to compare incomes of a variety of farm populations and the U.S. total population.

The income units are defined as either families or households. Families are groups of two or more related persons; households are groups of one or more which include all persons in a dwelling unit whether related or unrelated. Income definitions using the primary data from the Farm Costs and Returns Survey are altered from the above descriptions in some cases to be consistent with definitions used in a comparison involving more than one data source. These variations in sources and definitions are noted.

LIMITATIONS

The interpretation of annual income of farm households is problematic for two major reasons. First, agriculture is a volatile sector and annual income to the sector, especially to individual farm businesses, is highly variable. Farmers generally expect to have wide swings in their income on an annual basis. Although no single year's income could adequately represent the financial well-being of farm businesses or households, 1984 was an especially stressful time for many. On the other hand, as this report and others have shown, 1984 was an extremely profitable year for some types of farms with unique structural arrangements, such as the contracting arrangements used by vegetable and melon and poultry and egg producers and some not heavily dependent on export markets (24, 26). One solution to this problem of annual volatility would be to analyze the distribution of households' average income for several years, if data permit, or ideally, to analyze the distribution of permanent income as distinct from permanent plus transitory income. Second, because farm businesses are usually closely held by farm households, separating business income and expenses from the household's finances is difficult conceptually and empirically.

Several data limitations exist in this report which affect the computation of business farm income. Neither actual sales nor a range of sales were reported for 140 farming operations. We do not know if these were truly zero sales or refusals. If they were refusals, then income for those operations is understated. In general, underreporting of income is a problem common to all individual surveys. Data to estimate the value of the change in inventories were not collected on the survey. Therefore, full income will be underestimated for those households which stored commodities and overestimated for those households which sold from past years' production. In 1984, the value of the inventory change for the sector is estimated at approximately $8 billion (25). Because the inventory adjustment was positive for the whole sector, more incomes were likely underestimated than overestimated in this report. As mentioned, farm businesses generally incur expenses to receive Government payments or to produce household farm income, but

these inseparable expenses are all accounted for in business farm income. This situation affects how farm income is distributed among the three types but does not affect the total farm income. Business and household income tax expenses were not collected on the survey; therefore, the incomes in this report are all before-tax income. Before-tax income is obviously greater than after-tax income. More important, as a result of the tax code, the distribution of after-tax income probably differs from the distribution of before-tax income.

A final word of caution relates to the interpretation of the distribution of income from Government payments. These results reflect only direct Government payments for participating in the income support programs and exclude several other effects of Government programs on income, expenses, and assets. That is, the effects of many other Government programs, such as nonrecourse loans and marketing orders, and the indirect effects on prices and asset values from the income support programs are excluded.

TRENDS IN THE SIZE DISTRIBUTION OF MONEY INCOME

The purpose of measuring the size distribution of income is to determine how total income earned by a specified population is distributed among members of that population. The size distribution of income is measured annually by the U.S. Department of Commerce for the United States and for various subpopulations, including some of the previously defined farm populations. However, the U.S. Department of Commerce does not measure the size distribution of income for farm operator households. The necessary data have been collected and analyzed infrequently by the U.S. Department of Agriculture. Size distributions of income for farm operator households have been estimated historically for 1946 and 1966 (7, 13) and for 1984. A comparison of these size distributions indicates changes over the past four decades. However, the size distribution of each year represents only that single year. The year 1946 was a very high income year for the farm sector: net farm income (in constant dollars) was only slightly below the all-time record high income year, 1973 (25). The farm income in 1966 was more average, although it was the highest of the decade (25). In general, the percentage of the households with lower incomes decreased over these three periods, and the percentage of the households in the highest income class increased. The average money income of farm operator households in constant 1967 dollars increased almost 90 percent from $3,436 in 1946 to $6,490 in 1984 (table 2).7/ The average incomes of the middle income households were, not suprisingly, very stable. Because the lowest and highest income categories are open ended, the average incomes in those categories were more erratic. The year 1984 was a year of extremes: the lowest income category had the lowest average income and the highest income category had the highest average income of the 3 years in constant dollars.

TOTAL, FARM, AND OFF-FARM SOURCES OF INCOME IN 1984

The average farm operator household's total income from farm and off-farm sources (excluding the value of the inventory adjustment) was $26,633. Fifteen percent of all farm operator households had negative total incomes and 11 percent had incomes in excess of $60,000; the Gini index is a relatively high 0.60, compared with a Gini index of 0.38 in 1983 for all U.S. families (31).8/

7/ Farm operator household income in this section for 1984 is defined to exclude noncash income to be consistent with the earlier data.

8/ The Gini indexes reported throughout this report for farm households are calculated with the negative incomes recoded to zero. This calculation will have the effect of underestimating the degree of inequality.

Table 2--Distribution trends of net total money income of farm operator households, 1946, 1966, and 1984 1/

Item	Net total money income per households				
	Less than $2,572	$2,573- $5,143	$5,144- $10,287	$10,288 and more	All farm households
			Percent		
Share of households:					
1946	56.0	24.1	14.2	5.7	100
1966	31.8	25.6	30.5	12.1	100
1984	39.2	15.8	22.8	22.2	100
Share of income:					
1946	10.9	26.1	28.9	34.1	100
1966	6.2	17.6	39.9	36.3	100
1984	-32.0	9.4	26.2	96.4	100
			Real 1967 dollars		
Average household income:					
1946	669	3,716	7,010	20,345	3,436
1966	1,060	3,755	7,119	16,409	5,453
1984	-5,302	3,858	7,475	28,183	6,490

1/ For 1946, the constant dollar endpoints are slightly lower (less than 0.3 percent).
Source: (7, 13) and 1984 Farm Costs and Returns Survey, USDA.

The increasing dependence of operator households on off-farm sources of income has been documented for some time (14, 18, 25). Of the average income of operator households (excluding the value of inventory changes), 61 percent originates from sources other than the farm operated, half of that (31 percent) from off-farm wage and salary jobs (table 3). Such a dependence on off-farm sources of income supports the relevance of the human capital theory for explaining income distribution for operator households because off-farm employment generally requires a greater ratio of human capital to other sources of capital than does farming. Most of the 39 percent of the income earned on the farm flows directly from the farm business to the farm household as rental value of the farm dwelling for resident operators, food produced and consumed on the farm, and wages and benefits paid to operator households by the farm business for their labor on the farm.

Including Government farm program benefits, the survey data indicate that net income from the production of agricultural commodities (excluding the value of the change in farm inventories) accounts for only 10 percent of the average farm operator household's total income. However, because these survey estimates of income are before taxes and because farm losses often shelter off-farm income, farm income probably contributes a larger share to total income on an after-tax basis than on a before-tax basis (17).

ie 3--Average total income by total income class and source of income, 1984

Income source	Total income class							
	Negative income		Less than $10,000		$10,000 to $24,999		$25,000 to $3	
	Average	Share of total	Average	Share of total	Average	Share of total	Average	Share o
	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Per
iness farm	-52,446	139	-5,039	-96	-1,422	-8	2,533	
sehold farm	7,911	-21	4,960	95	5,679	33	6,945	
ernment payments	2,547	-7	565	11	877	5	1,367	
tal farm income	-41,988	111	486	9	5,134	30	10,846	
es and salaries	1,887	-5	1,990	38	7,452	43	14,492	
iness and professional	877	-2	722	14	1,221	7	2,423	
es from other farms	131	0	165	3	227	1	99	
er off-farm income	1,379	-4	1,859	36	3,175	18	3,768	
tal off-farm income	4,274	-11	4,737	91	12,076	70	20,782	
tal household income	-37,714	100	5,223	100	17,209	100	31,628	

	Total income class					
	$40,000 to $59,999		$60,000 or more		Total	
	Average	Share of total	Average	Share of total	Average	Share o
	Dollars	Percent	Dollars	Percent	Dollars	Perc
iness farm	11,504	24	77,930	53	749	
sehold farm	9,207	19	16,743	11	7,689	2
ernment payments	2,326	5	7,009	5	1,982	
tal farm income	23,038	48	101,683	69	10,420	3
es and salaries	16,979	35	10,591	7	8,216	1
iness and professional	3,914	8	24,163	16	4,065	
es from other farms	196	0	84	0	159	
er off-farm income	4,141	9	11,502	8	3,772	
tal off-farm income	25,230	52	46,340	31	16,213	
tal household income	48,268	100	148,023	100	26,633	1

ource: 1984 Farm Costs and Returns Survey, USDA.

Two clear trends emerge from the distribution of sources of income to total income classes: as total income increases, income from both farm and off-farm sources increases; and, as total income increases, the percentage of income from farm sources increases and the percentage of income from off-farm sources decreases. Only the two largest income classes earn about half or more of their income from farm sources; most of their farm earnings are from the production of agricultural commodities. Those households with negative total income lost on average $41,988 in farming. They also received an average of $2,547 in Government payments, second only to households in the highest income class of $60,000 and over. On average, households with negative incomes have the lowest income from off-farm sources, but some of the households with large farm losses probably sheltered off-farm incomes from higher taxes.

Previous analysis of the distribution of sources of income and their contributions to income inequality determined that business farm income and Government payments were distributed more unequally than household farm income and total off-farm income (2). Total farm income contributed 87 percent of the income inequality among operator households; business farm income represented 79 percent, household farm income 5 percent, and Government payments 3 percent. Total off-farm income contributed only 13 percent to the total income inequality.

The contribution of Government payments to income inequality merits elaboration. First, a positive relationship exists between average Government payments and farm size because many programs are based on production. Second, because Government payments are not proportionately distributed, they have a high Gini index (that is, they are very unequally distributed) and make a positive contribution to the overall income inequality. Third, that contribution is small for two reasons: Government payments represent a small share of total income, and Government payments contribute a larger share to total incomes of households in the two lowest income classes. For the other classes, the proportion is generally constant. Households in the negative total income class receive average payments second only to the highest total income class. This negative total income class includes a significant portion of the high production farms. Fourth, the contribution of payments to inequality is smaller than their share of total income, implying that if Government payments were to increase, total inequality would decrease. This relationship, however, may be short run because of the proportion of large farms in the negative total income class and because business farm income was more unequally distributed during the survey year than during other less stressful periods for the agricultural sector. Finally, this analysis includes only the direct effect from Government payments and excludes any indirect price or structural effects.

HOUSEHOLD INCOME PROFILE BY SELECTED FARM CHARACTERISTICS

The average incomes of operator households, the contribution various income sources make to total household income, and the size distribution of income vary considerably across the most common categorization of farms (tables 4-8).

Product Sales Class

A popular categorization of farms is by size of production. Both acreage classes and product sales classes are typically used to measure size. Acreage as a determinant of farm size varies more by the type of production than does farm size measured by sales classes. Thus, sales classes tend to be the preferred measure.

Average incomes increased as product sales increased. The smallest farms' incomes averaged $18,305 compared with $219,091 for the largest farms (table 4). Survey data indicate that 42 percent of farms fell into the category of less than $10,000 in sales.9/ These smallest farms accounted for only 2 percent of sales but had 7 percent of cash expenses and about 20 percent of the estimated depreciation expense, leaving them with a negative share of estimated net farm income. The next class of farms, those with sales of $10,000 to $40,000, lost money in farming if Government payments and household farm income are excluded. Farms with sales under $40,000 generally depended on off-farm sources of income. Only farms with sales over $100,000 have a sales share greater than their portion of cash expenses and earn most of their income from farming.

In contrast to the distribution of earnings from the production and sale of commodities, household-related income (such as the rental value of farm dwellings) was more equally distributed among sales classes. Household-related income partially offset the greater concentration of farm business and Government payments on the larger farms.

Product sales classes are often used as proxies for the size distribution of income in agriculture. Equating sales classes with income classes can be misleading because of the wide dispersion in income within each sales class. As the sales classes increase in value, the percentage of operators in the highest income classes and the average income tend to increase. However, the lowest sales class category actually had the lowest percentage of operator households with negative total incomes. Eleven percent of that lowest sales class category also had total incomes over $40,000. The largest sales class category more closely approached the positive relationship generally expected between sales and income classes, with one exception: 17 percent of operator households in the largest sales class category had negative total incomes. The negative incomes for the farms with large sales may have resulted from many factors, such as financial stress, large additions to inventories, and large annual variations in income.

Region

The average incomes were relatively similar by region; the Delta States had the lowest average income of about $24,000 and the Pacific States had the highest of about $33,500 (table 5).10/ The contribution of sources of income to total incomes differs by region. The Corn Belt and Northern Plains regions earned the greatest share of their income from business farm income. The Southern Plains region had a negative contribution of income from all farm sources combined; however, that situation may be the result of operators' increasing inventories, particularly wheat, which are not accounted for in this measure of farm income. Household farm income made the largest contribution to households in the Northeast, mainly because of the effect of high land values on the imputed rental values of farm dwellings.

Income was most unequally distributed in the Southern Plains. This region and the Northeast also had the highest proportion of households with negative total incomes. The Lake States had the most equally distributed income by region; the Gini index is a relatively low 0.50. The Appalachian States had a much lower proportion of operator households with negative income, 7 percent compared with 15 percent overall.

9/ This compares with 48 percent of all farms having less than $10,000 in sales, according to the official estimates (25).

10/ See fig. 2 for a regional classification of States.

Table 4--Distribution of households by income classes and average household income by value of agricultural product sales, 1984

Value of agricultural product sales	Distribution of households by income class						Average household income				
	Negative income	$0 to $9,999	$10,000 to $24,999	$25,000 to $39,999	$40,000 to $59,999	$60,000 and more	Farm income: Business	Farm income: Government	Farm income: Household	Off-farm income	Total income
	Percent						Dollars				
Less than $10,000	12	25	32	19	8	3	-7,683	166	5,809	20,013	18,305
$10,000 to $39,999	18	19	32	19	8	4	-5,963	1,035	5,858	18,101	19,032
$40,000 to $99,999	18	11	25	21	15	9	687	3,091	7,307	9,594	20,679
$100,000 to $499,999	17	6	10	12	17	38	19,269	5,867	13,036	10,783	48,955
$500,000 and over	17	1	3	5	4	69	152,567	14,263	38,010	14,251	219,091

Source: 1984 Farm Costs and Returns Survey, USDA.

Table 5--Distribution of households by total income class and average household income by region, 1984

Region	Distribution of households by income class						Average household income				
	Negative income	$0 to $9,999	$10,000 to $24,999	$25,000 to $39,999	$40,000 to $59,999	$60,000 and more	Farm income: Business	Farm income: Government	Farm income: Household	Off-farm income	Total income
	Percent						Dollars				
Northeast	22	21	25	14	7	12	2,292	584	10,676	11,403	24,955
Lake States	12	14	29	21	14	10	1,029	1,982	8,052	14,879	25,942
Corn Belt	13	15	27	20	13	13	7,011	1,263	6,621	14,788	29,682
Northern Plains	18	16	27	17	10	13	4,117	4,747	6,284	9,495	24,643
Appalachian	7	26	33	16	10	7	2,198	371	6,173	16,146	24,889
Southeast	19	19	22	22	9	9	-314	847	7,166	17,516	25,215
Delta States	18	26	26	14	6	10	-399	2,640	7,675	13,929	23,845
Southern Plains	22	19	24	19	9	8	-13,783	2,450	7,043	29,527	25,236
Mountain States	18	14	28	15	11	14	-1,754	4,593	10,381	13,819	27,039
Pacific States	16	13	24	21	10	16	-11	2,199	12,755	18,556	33,499

Source: 1984 Farm Costs and Returns Survey, USDA.

Figure 2

Regions of the Continental United States

Type of Production

Average incomes varied greatly by the type of production in which farms specialize (table 6). Households associated with farms with negative business farm income generally had the lowest average total incomes. General crop farms had the largest farm losses and the lowest average total income.11/ On the other hand, households with high average total incomes were those more dependent on farm sources of income. For example, poultry and egg producers had the highest incomes, with an average of $67,500, and earned about 80 percent of it from farm sources. Besides general crop farms, operator households for three types of farms had average incomes below the total operator household average: other livestock, general livestock, and field crops. Twenty-seven percent of the poultry and egg producers had incomes over $60,000 compared with lows of 6 percent of the general crop and general livestock producers. The general crop farms had the most households with negative total household incomes (28 percent). In contrast, only 8 percent of the nursery and greenhouse producers had negative household incomes.

11/ We do not know how many of the operations that reported zero sales were true zeros or refusals. All of these operations were classified as general farms and may account for their large farm losses as a group.

ble 6--Distribution of households by total income class and average household income by type of production, 1984

Type of production	Distribution of households by income class						Average household income				
	Negative income	$0 to $9,999	$10,000 to $24,999	$25,000 to $39,999	$40,000 to $59,999	$60,000 and more	Farm income: Business	Farm income: Government	Farm income: Household	Off-farm income	
	Percent						Dollars				
sh grain	12	13	25	20	13	18	9,764	4,529	7,329	14,166	3
eld crops	10	25	32	15	10	9	1,018	1,698	6,675	14,834	2
getables and elons	17	18	19	22	8	17	19,334	1,255	11,635	15,149	4
its and tree nuts	15	14	27	16	12	16	-1,164	230	12,786	18,061	2
rsery and green-ouse	8	10	27	11	24	19	9,470	39	10,405	21,953	4
neral crop	28	24	24	11	7	6	-15,148	798	7,423	14,994	
neral livestock	15	20	29	21	9	6	-4,884	858	6,800	20,724	2
iry	15	15	27	19	12	12	9,113	3,068	9,986	6,060	2
ultry and eggs	11	8	21	16	17	27	44,914	408	8,051	14,133	6
ner livestock	20	22	23	23	4	8	-15,829	343	9,151	24,722	1

Source: 1984 Farm Costs and Returns Survey, USDA.

Farm Equity Class

Average incomes increased as farm equity increased (table 7). Farms with the highest equity were more dependent on farm sources of income than the farms with lower equity. However, the middle equity group ($500,000 to $1 million) had the greatest dependence on farm sources of income. The middle group also had the greatest dependence on Government farm payments.

Income was more equally distributed by farm equity categories than by any other farm characteristic analyzed. As farm net worth increased, the distribution of total incomes shifted and average incomes increased except for those with negative incomes. Such a finding is not suprising in light of the greater ratio of other capital to human capital required to successfully earn a living in farming. This finding also underscores the importance of the life-cycle and inheritance theories' emphasis on accumulation of other capital for explaining the income distribution of operator households. Despite the high percentage of operator households with negative total income (27 percent) in the highest equity class, the average total income was $147,617. Because of the concentration of households in the highest income category, this farm equity class also had the most equally distributed income (Gini index = 0.45). The proportion of operator households who have negative total incomes increased as farm equity increased, possibly because farm operators in higher equity classes increased their inventories in 1984.

Debt-to-Asset Ratio

Many farmers increased their debt loads during the 1970's as land values increased. Consequently, interest expenses as a percentage of total production expenses doubled between 1970 and 1984. As land values have fallen and other economic factors have not been favorable for the sector, the extent of the debt load as a portion of an operator's asset base has become a critical factor in farm survivability. As the debt-to-asset ratio increased, the average incomes generally decreased, the percentage contributed from business farm income decreased, and the percentage contributed from all other sources increased (table 8). Households reporting no farm debt were the exception to these general trends. Those households had a higher percentage of their total income from off-farm sources than other households with a debt-to-asset ratio below 0.70 and had an average income below households with a debt-to-asset ratio of 0.01 to 0.40. However, some households that had debt may have refused to report it and, thus, were classified as not having debt, but the extent of such underreporting and its likely effect is unknown.

Households without farm debt have the lowest percentage of households with negative incomes as well as the lowest percentage with high incomes (over $60,000). The average income of households without debt was a relatively high $24,138. Households associated with farms with some debt but with debt-to-asset ratios of less than 0.40 had the highest average income of all indebted categories, $32,961. Nineteen percent of all farms had debt-to-asset ratios greater than 0.40. For those farms, as the debt-to-asset ratio increased so did the percentage of households with negative incomes, and the average income decreased. The average income of households associated with farms whose debt exceeds the asset value was $11,205.

Table 7--Distribution of households by total income class and average household income by farm equity class, 1984

Farm equity class	Distribution of households by income class						Average household income			
	Negative income	$0 to $9,999	$10,000 to $24,999	$25,000 to $39,999	$40,000 to $59,999	$60,000 and more	Farm income: Business	Farm income: Government	Farm income: Household	Off-farm income
	Percent						Dollars			
Less than $100,000	14	24	33	18	7	4	-2,177	834	4,507	14,451
$100,000-$499,999	15	16	26	20	13	10	467	1,755	7,748	15,056
$500,000-$999,999	20	7	12	15	14	32	11,960	6,246	14,492	15,063
$1 million-$3 million	22	9	9	8	5	47	10,910	8,860	25,727	52,078
Over $3 million	27	2	5	6	5	55	24,628	8,571	38,593	75,825

Source: 1984 Farm Costs and Returns Survey, USDA.

Table 8--Distribution of households to total income class and average household income by debt-to-asset ratio, 1984

Debt-to-asset ratio	Distribution of households by income class						Average household income			
	Negative income	$0 to $9,999	$10,000 to $24,999	$25,000 to $39,999	$40,000 to $59,999	$60,000 and more	Farm income: Business	Farm income: Government	Farm income: Household	Off-farm income
	Percent						Dollars			
No debt	10	25	32	18	9	6	1,917	673	6,208	15,341
0.01-0.39	15	13	25	19	13	15	2,434	2,472	9,123	18,932
0.40-0.69	24	12	21	18	10	14	-2,954	3,796	8,339	13,354
0.70-1.00	33	15	24	11	8	9	-6,778	3,991	7,238	9,750
Insolvent	34	17	19	11	5	14	-12,694	3,773	7,410	12,717

Source: 1984 Farm Costs and Returns Survey, USDA.

FARM OPERATOR HOUSEHOLDS WITH LOW MONEY INCOMES IN 1984

Income of farm operator households was very unequally distributed. Many households had large losses and many had very high incomes. Farmers are accustomed to some annual variation in their money incomes and plan their business expenditures and household consumption accordingly. In 1984, almost 40 percent of farm operator households had low money incomes when low money income is defined as below the official poverty line for a family of four ($10,610 in 1984).12/ Note that this rate can not be interpreted as a poverty rate because the size of the farm household and the number of children were not collected in the 1984 survey. Moreover, because of the annual volatility in farm income and the operator control over when to sell some storable commodities, annual poverty rates can be misleading. Some of the low money income households probably relied on savings to cover living expenses, reduced or postponed some share of living expense, or were forced to borrow for consumption purposes or to sell farm assets, possibly lowering their future earning capacity. The extent of these practices is not well known.

One goal of farm policy has been to support farm incomes. Government programs support farm incomes indirectly through support of agricultural commodity prices and directly through transfer payments to producers of major row crops. Unit transfer payments are based on the difference between an established target price and an average market price. Generally, as the amount of the supported commodities produced by an operation increases, farm operation becomes increasingly eligible for income support up to a limited amount (currently $50,000).13/ This concept of income support is distinct to farm policy and differs from the usual view held in general income policy of income support as providing an income floor. Income supports in farm policy are designed to increase farm income and permit a fair return on production without regard to its distribution to people (with the exception of the $50,000 limitation). Farm income supports contrast with income supports for the general population where the primary focus is on the distribution of income to people. There has been limited discussion over whether the current version of farm income supports should include a means test tied to income, wealth, or both.

In any case, farm programs have relatively little direct effect on the incomes of operators for whom farming is not a major occupation. About a quarter of the farm operator households with low money incomes in 1984 did not have farming as a major occupation. To better understand the implications of targeting farm income support policies, four types of farm operator households have been defined based

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12/ Low money income can be measured in an absolute or relative sense, and each approach has its purposes (22). A relative approach is useful if a lowest quantile is of interest for comparing with others in the group (for example, to compare the farm households with the lowest 20 percent of incomes with other farm households). An absolute approach is useful if the interest is in measuring how many households have difficulty meeting their basic needs. The absolute approach is of interest in this analysis, particularly because of the controversy over taxpayer transfers for farm programs. The absolute approach used here is based on market data regarding dollar requirements necessary to cover minimum essential living expenses. The U.S. Department of Commerce does not compute a separate level for households; the family level is used (31).

13/ The current ceiling of $50,000 may not provide a sufficient business income floor for very large farms where risks and losses can be large.

on low money income status and the major occupation of operators. The net worths of these types and their income sources illustrate the extent of households with low money incomes, the proportion of low money income households who can potentially be most directly affected by farm policies (those with farming as a major occupation), and the wealth position of each of these types of households (table 9).

Type I - Households With Farming as a Major Occupation and With Low Money Income

Nearly 30 percent of farm operator households had farming as a major occupation and had low money incomes. These type I households had average incomes of -$13,344. The farms of the type I households had about a quarter of all the sector's sales. Their average Government farm payment income totaled $1,711, slightly below the average for all farms. Their farm equity was a relatively high $226,672, and they had the highest debt-to-asset ratio of the four types.

The major difficulty for these households was the large cash losses from business farm income, in part because of their heavy debt load and resulting interest expenses. They had relatively low off-farm incomes, amounting to less than a quarter of their farm losses. To the extent that these farms produce commodities for which a Government program has been established and, if a means test for receipts of Government payments becomes incorporated into farm policy, the type I households had the greatest potential responsiveness and need for support because their incomes were low, their production was relatively high, and their major occupation was farming.

Type II - Households With Farming as a Major Occupation and Without Low Money Income

About 35 percent of farm households fell into the type II group of households with farming as a major occupation and with incomes above the low money income level. The sales of type II operations were more than 60 percent of the sector's total sales. Their average incomes were the highest of all four groups, nearly $52,000. These households had more than double the income of Type I households from all sources. However, their farm income from all sources made the most significant contribution to their high incomes, both absolutely and in relation to other groups. Their average Government payment of nearly $4,000 was the highest of all groups of households although it made a relatively small contribution to their total incomes. Their large Government payment is indicative of the production-linked programs.

This group was unique in having high incomes from off-farm sources other than employment, such as interest, dividends, transfer payments, and rental of nonfarm property. Such sources of income probably do not require large commitments of time, allowing operators to be engaged in farming activities for the majority of their work time. The type II group also had the highest average asset, debt, and equity of all four groups. If a means test were a prerequisite to receiving direct Government payments, many of these households would stand to lose because of their very secure financial position.

Type III - Households Without Farming as a Major Occupation and With Low Money Income

Only about 10 percent of farm operator households were type III households, those whose major occupation was not farming and who had low money incomes. Their sales and expenses were both much lower than type I households, but their net

e 9—Average financial position of farm operator households based on low money income status and major occupatio
1984

Item	Farming as major occupation		Major occupation other than farm	
	Low money income: Type I	Above low money income: Type II	Low money income: Type III	Above lo money inc Type IV
		Dollars		
l farm income	-17,681	39,438	-18,431	4,627
siness farm income	-20,298	33,398	-19,589	3,669
Gross income	53,123	125,506	24,638	30,734
Expenses	73,420	92,108	44,226	27,065
vernment farm payment	1,711	3,805	348	495
ges paid household	906	2,235	810	462
l off-farm income	4,337	12,439	6,864	38,544
nfarm wages and salaries	1,411	4,009	4,163	23,247
ges and salaries-other farms	145	198	200	103
siness and professional	530	2,197	1,464	11,655
ther	2,251	6,035	1,036	3,539
tal household income	-13,344	51,877	-11,567	43,170
ts	314,883	449,685	240,589	198,343
s	88,211	97,398	37,676	29,981
uity	226,672	352,286	202,912	168,362

ource: 1984 Farm Costs and Returns Survey, USDA.

farm income of -$18,431 was very similar. Their off-farm income was higher than that of type I's, making their total household losses of -$11,567 somewhat less. Although their major occupation was not farming, these households earned relatively little off-farm income. Their average equity was well above the average for all U.S. families but below the average farm operator household's equity. Their debt-to-asset ratio was a relatively low 0.16. These households were largely not directly affected by farm income support programs because of their low production levels.

Type IV - Households Without Farming as a Major Occupation and Without Low Money Income

About a quarter of farm households fell into the type IV group of households with a major occupation other than farming and without low money incomes. This group of households had a positive farm income of $4,627 and a large average income from off-farm sources. Their average farm sales were in the same range as type III households but their expenses were much less. The average total income of type IV households from all sources, $43,170, was second only to households with farming as a major occupation and without low money income. Their farm assets, debt, equity, and debt-to-asset ratio were the lowest of all household types. These households were relatively little affected by farm programs because of their small contribution to production and their low production capacity.

The Role of Inventories

An important source of nonmoney farm income to farm operator households has been omitted from the previous analysis: the value of the change in inventories. Many times operators choose to store their commodities and postpone sales and current income in hope of receiving a better price for their commodities in the future. Some of the households with low money income probably chose not to sell their commodities and relied on savings to cover living expenses.

Data permit a definition of farm income which includes the value of the change in inventories for crops only.14/ When these crop inventory changes are included, the relationships reported in table 9 change only slightly. The most significant effect was that about 2 percent of households whose major occupation was farming moved from being below the low money income level to above that level. Therefore, only a small percentage of households with low money income had inventories that they chose not to sell in 1984.

THE FINANCIAL WELL-BEING OF FARM PEOPLE COMPARED WITH THE FINANCIAL WELL-BEING OF OTHER PEOPLE

Interest in the financial position of farm households in relation to nonfarm households began with a concern about the low incomes of farm households more than 50 years ago. The concept of parity developed out of this same concern. Although farm policy is no longer directly based on parity indicators, the interest

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14/ The value of crop inventory changes is included by replacing crop sales and net CCC loans by the value of crop production less the value of that used on the farm. Changes in the value of livestock inventories amounted to about -$1.7 billion, -20 percent of the total in 1984, but their estimates are not available in a form which allows analysis in conjunction with other microeconomic-level data.

in the relative status of farm households perists. The high cost of Government farm programs and the resulting large transfer of income from nonfarmers to farmers keeps alive the political interest in the financial well-being of farm households.

The Government's major farm programs are direct payments, mainly under commodity programs, and the Commodity Credit Corporation (CCC) nonrecourse loan program. The Government also provides subsidized loans through USDA's Farmers Home Administration, subsidizes a crop insurance program, and provides potential insurance for the Farm Credit System which is regulated by the quasi-governmental Farm Credit Administration. The Government also intervenes in agriculture through the income tax system. Individuals and corporations reporting farm income are eligible for several preferential tax code provisions (for example, additions of some capital assets can be treated as expenses). Sole proprietor farmers as a group pay less in taxes on their farm income to the Federal Government than they save in taxes from sheltering their nonfarm income with their tax losses in farming. Reinsel estimated for 1982 that if farm income had not been taxed at all, the total tax revenue received by the U.S. Treasury would have increased by $3.8 billion (17).

Income

There is only one annual source of data on the financial well-being of both farm and nonfarm populations, the Current Population Survey (CPS) collected and published by the U.S. Department of Commerce. This data source distinguishes the farm populations by farm residence, major occupation as farming, and whether or not farm self-employment income is earned. The advantage to this data source is that the population and the income are defined consistently within any given year. Except for a few years, the farm populations generally had lower average incomes than the corresponding nonfarm populations. The largest farm-nonfarm gap is between those who have farming as a major occupation and those who do not. In 1983, the income of those with a major occupation in farming was 63 percent of the income of others, farm residents earned 84 percent of the income of nonresidents, and farm self-employeds earned 93 percent of others (31). Estimates of the incomes among nonfarm populations are very similar to each other, but the incomes among farm populations vary considerably. Because income is consistently defined, the variation in the relative status of farm to nonfarm populations is a function of the way in which the population is defined.

The disadvantage of the CPS data base is that it does not provide annual data on farm operator households, the group for which USDA estimates farm and off-farm income. Likewise, USDA does not estimate the income of nonfarm households; thus a comparison of farm operator households and nonfarm households has not been readily available. Instead, second-best comparisons have been made using the residential, occupational, or farm self-employment data, or else the USDA farm operator household income estimates have been incorrectly compared with one of the readily available nonfarm population income estimates.

The major problem with comparing the USDA farm operator household income series with the money income of U.S. households is the inconsistent definition of income. The USDA estimate includes the value of the change in inventories, the imputed rental value of farm dwellings, and the value of home-consumed, farm-produced commodities, all nonmoney income items. The income of U.S. households, in con-

trast, includes only money items (except for depreciation charges for farm households).15/

The USDA farm operator household income definition can be adjusted to more closely correspond with the definition of the U.S. household money income estimate (table 10). In our adjustments, the nonmoney items are excluded and the cash wages and salaries farm establishments pay operators and their household members are included for recent years when data are available. The values of the nonmoney income items of farm operator households are not available in a comparable form for the U.S. population as a whole. Including the nonmoney income items for one population, farm households, is inappropriate for an income comparison when a complete accounting of all sources of nonmoney income is not available for both farm and nonfarm populations.16/ Nonfarm households receive larger amounts of some sources of nonmoney income in relation to farm households (12). For example, in 1984, the percentage of farm residents receiving means-tested benefits, such as Medicaid, was less than half the percentage of nonfarm residents receiving benefits even though the poverty rate of farm residents is significantly higher than for nonfarm residents (29).

The imputed value of the rental services from farm dwellings in 1984 accounted for over half of the adjustment to the USDA estimate of total operator income. The imputed rental value has increased over time at about the same rate as the value of farm real estate (1). The value of foods produced and consumed on the farm has remained relatively stable in nominal terms because the increase in commodity prices has offset the decline in the quantity of foods produced and consumed on the farm as the farm population has declined.

The most volatile of all the income components is the value of the inventory change. The 1983 inventory adjustment was -$10.6 billion compared with $7.8 billion in 1984. That adjustment offset the gross imputed rental value in 1983 leaving very little difference on balance between the adjusted and unadjusted estimate. The only addition to the USDA series is the value of cash wages and salaries farm establishments pay their operators and household members. This practice has probably increased over time, especially as more farms become incorporated. However, data have been collected only very recently. The definitional adjustments will generally lower the USDA estimate. The adjusted USDA series ranged from 0.71 to 0.99 of the unadjusted series.

The U.S. Department of Commerce has collected household income data for the CPS only since 1967. Because farm operator households are not identified on the CPS annually, households other than farm operators cannot be identified. Therefore, the average money income of farm operator households was compared with the average money income of U.S. families until 1967 and for households, thereafter (table 10). The income estimates for the U.S. populations include the incomes of the unemployed, in contrast to the farm population which by definition is employed in farming. On average, farm operator households' income has been about 94 percent of all households in the United States. In 7 of the years since 1960, farm house-

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15/ A measurement problem remains, aside from the definitional inconsistency. The CPS data underestimates household income because of known underreporting by respondents. The farm income component of the USDA estimate is derived from actual production data rather than from farmers' reports of their receipts (10, 27).

16/ This reason is also why we eliminate the farm-nonfarm residence distinction in the definition of the official poverty line. See Getz for a description of the development of the poverty definition over time (9).

Table 10 — Adjusted USDA total income of farm operator households and average U.S. money income

Year	USDA farm operator income		Gross rental value of farm dwellings	Value of food produced and consumed on the farm	Value of change in inventories	Wages paid to self	Adjusted USDA farm operator income	Average adjusted USDA farm operator income	Average U.S. money income 1/	Ratio farm to popu in
	Per farm	Total								
	Dollars	Million dollars						Dollars		R
1960	4,969	19,693	2,098	1,135	397	NA	16,063	4,053	6,627	
1961	5,522	21,120	2,202	1,109	336	NA	17,473	4,568	6,471	
1962	5,950	21,968	2,258	993	620	NA	18,097	4,902	6,670	
1963	6,380	22,790	2,360	921	629	NA	18,880	5,286	6,998	
1964	6,401	22,129	2,443	835	-817	NA	19,668	5,689	7,336	
1965	7,636	25,626	2,481	811	1,042	NA	21,292	6,344	7,704	
1966	8,548	27,842	2,599	824	-83	NA	24,502	7,523	8,395	
1967	8,486	26,834	2,747	736	657	NA	22,694	7,177	7,989	
1968	9,049	27,788	2,838	719	124	NA	24,107	7,850	8,760	
1969	10,302	30,905	3,046	731	99	NA	27,029	9,010	9,544	
1970	10,845	31,983	3,268	776	6	NA	27,933	9,472	10,011	
1971	11,758	34,122	3,475	744	1,397	NA	28,506	9,823	10,383	
1972	14,238	40,722	3,713	889	861	NA	35,259	12,328	11,286	
1973	20,925	59,070	4,147	1,115	3,406	NA	50,402	17,854	12,157	
1974	19,822	55,402	4,942	1,190	-1,611	NA	50,881	18,204	13,094	
1975	19,614	49,447	5,355	1,128	3,399	NA	39,565	15,694	13,779	
1976	18,765	46,856	6,115	1,182	-1,548	NA	41,107	16,463	14,922	
1977	18,730	46,002	7,250	1,160	1,080	NA	36,512	14,866	16,100	
1978	23,447	57,116	8,057	1,120	2,130	NA	46,809	18,805	17,730	
1979	26,980	65,562	9,270	1,245	5,045	NA	50,002	20,577	19,554	
1980	22,741	55,328	11,045	1,134	-5,928	NA	49,077	20,171	21,063	
1981	27,406	66,705	12,597	1,124	5,751	NA	47,233	19,406	22,787	
1982	26,030	62,497	12,936	1,048	-1,430	2,025	51,968	21,644	24,309	
1983	22,697	53,791	12,122	973	-10,565	1,858	53,119	22,413	25,401	
1984	32,020	74,543	11,900	988	7,827	1,248	55,076	23,658	27,464	

-Not available.
' For 1960-66 data are for families. For 1967 forward, data are for households.
urce: (25,31).

holds have actually had incomes higher than the average U.S. income. In 1973, farm households had a money income of $17,854 compared with a U.S. average of $12,157; in 1984, farm households averaged $23,658 compared with $27,464 for all U.S. households.

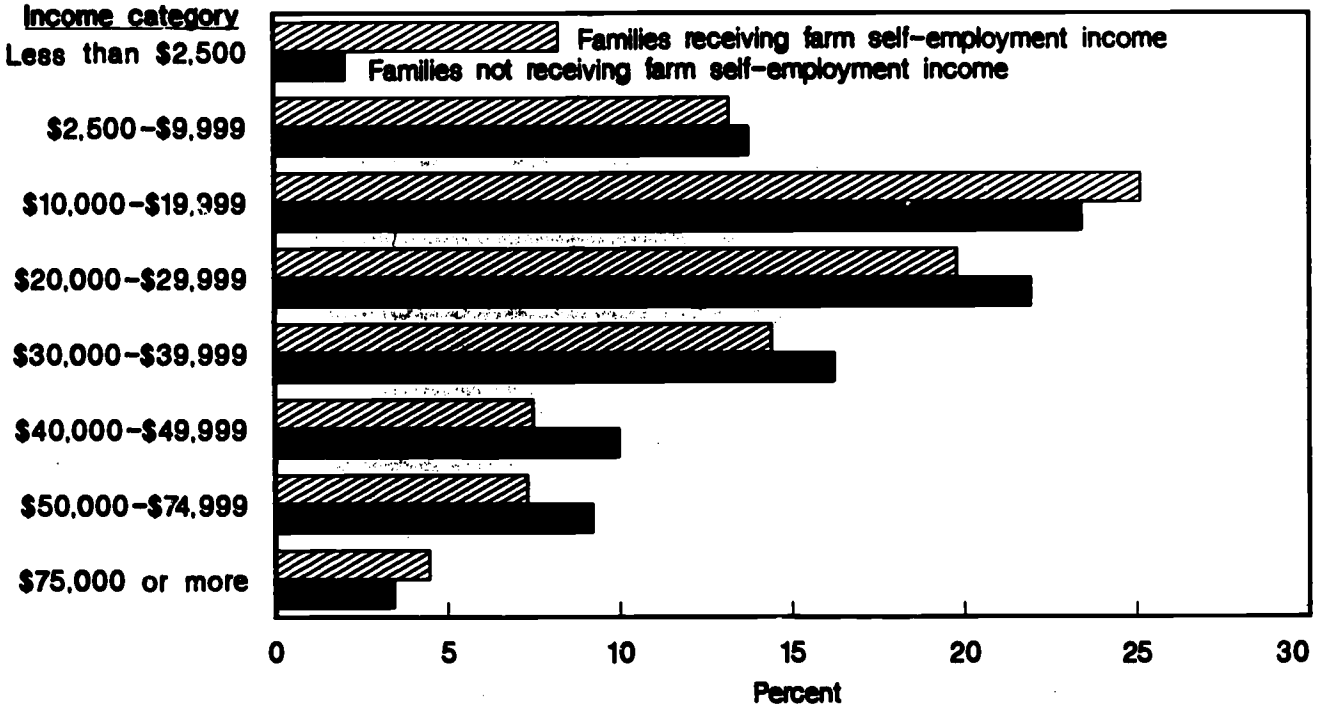
These adjustments to the USDA estimates of the total farm operator household income improve the farm-nonfarm comparison, but several drawbacks to the comparison remain. First, the farm component of the USDA estimate of household income of farm operators is actually a measure of the farm income earned by farm establishments rather than by farm operator households. Farm returns go to farm operators, partners, and members of farm corporations, not only to operators. Equating a per farm measure of farm income with farm income per operator household is based on the tenuous assumption that there is one unique household per farm. As Schertz emphasized, "the major portion of U.S. farm products come from establishments that obtain resources from several different households" (21). The USDA estimate probably overestimates the farm income of operator households. In contrast, the off-farm component of income measures the off-farm income of farm operator households.

Second, comparison of average income masks the variation among households as evident from the size distribution of income described earlier. The income of farm households is more unequally distributed than is the income of nonfarm households (fig. 3). In large part, this unequal distribution is the nature of farming with any individual farm household experiencing a combination of relatively high and low annual incomes over time.

Third, the farm-nonfarm household comparison of income does not consider wealth, the other major factor affecting financial well-being of households. An alternative accounting of well-being would consider an estimate of the real capital gains on assets for the time period along with current money returns. Farm operator

Figure 3

Income Distribution of Families, 1983



Source: (31).

households generally have a lower ratio of income to net worth than do other households because of the large capital requirements necessary to earn a living in agriculture. Inclusion of real capital gains would raise the well-being of farm operator households in relation to other households in times of asset appreciation and lower it in times of deflation. These data are not available in the CPS or any other series. McConnen estimated that from the mid-1960's through 1978 per capita income, including real capital gains, of farm operator households exceeded the nonfarm per capita income (16). Because real capital gains are not realized until an asset is sold, they can be a fleeting source of "income" and not directly comparable to money income. In fact, real capital gains in the farm sector have been negative since 1981. The sector has lost 89 percent of the real capital gains which accrued during the 1971-80 boom period for farm assets (25).

Wealth

Despite the recent decline in asset values, farm operator households on average still have higher levels of wealth than the average U.S. family.17/ The average farm equity of farm operator households in 1984 was over $250,000 compared with an average U.S. family equity of $66,050 in 1983 (3, 4).18/ Over 60 percent of farm households had equity greater than $100,000 compared with only 17 percent of all U.S. families (table 11). Farm households had greater equity than U.S. families at all income levels. The income-to-equity ratio for all U.S. families was 39.8 percent compared with 8.0 percent for farm operator households. As incomes increased, equity generally increased at a slower rate as indicated by the positive relationship between the income category and the ratio for both populations. Even the low income farm households had high farm equity values on average. The average income of farm households in the lowest income group was negative, but those household's average equity was over $250,000. This category of farms contained many of the farms under stress as a result of low prices and large interest payments on their debt.

Due to the highly capital-intensive nature of the agricultural industry, operators are required to make large investments to run a full-scale farming establishment. Therefore, the complement to the relatively low income-to-net-worth ratios of farm operator households is that operators earn a low return on their investments relative to nonfarm investments. In 1984, the returns to equity for all farm asset owners (operators and nonoperator landlords) was 2.8 percent. When unrealized capital gains income are included in returns, the returns to equity equalled -16.1 percent (25).

If a farm-nonfarm income comparison is related to Government involvement in agriculture and the transfer of income from nonfarmers to farm people, then an additional issue is relevant. Individuals other than farm operators are eligible for farm program payments. Some farm landlords not operating a farm themselves receive Government benefits. USDA estimated that in 1984, about 1.6 million landlords who did not operate a farm received about 87 percent of the $5.4 billion in net rent received by landlords, including over $400 million in direct payments they received from Government farm programs. Very little is known about this group of farm resource owners who should be included in a farm-nonfarm comparison when the distribution of Government payments is the issue. The Census-defined population of farm self-employed families includes farm landlords who do not

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17/ Data on wealth are available for families only, not households.
18/ In 1979, farm equity was 95 percent of the total equity held by farm operator households (30).

Table 11--Ratios of money income to equity for farm operator households, 1984, and all U.S. families, 1983

Income category	U.S. families, 1983			Farm operator households, 198		
	Average money income	Average equity	Ratio of income to equity	Average money income	Average farm equity	Ratio incom farm e
	Dollars		Ratio	Dollars		Rat
Less than $5,000	3,306	12,051	27.4	-21,027	252,909	-8
$5,000-$7,499	6,113	20,146	30.3	6,259	152,206	4
$7,500-$9,999	8,712	27,832	31.3	8,742	173,851	5
$10,000-$14,999	12,428	36,277	34.3	12,537	163,431	7
$15,000-$19,999	17,271	36,816	46.9	17,419	154,955	11
$20,000-$24,999	22,137	45,564	48.6	22,333	202,371	11
$25,000-$29,999	27,071	60,513	44.7	27,262	204,040	13
$30,000-$39,999	34,289	69,083	49.6	34,550	217,683	15
$40,000-$49,999	44,096	95,658	46.1	44,509	271,817	16
$50,000 and more	87,873	262,254	33.5	132,864	567,968	23
Total	26,259	66,050	39.8	20,191	253,157	8

Source: (3, 4), 1984 Farm Costs and Returns Survey, USDA, and unpublished Federal Reserve Board data.

operate a farm if they receive share rent from unincorporated farms. The income of the farm self-employed families population has historically been higher than other farm populations, in part because this group includes landlords who do not operate farms themselves. The average income of families with farm self-employment income has been less than the income of other families in 6 out of the 10 years from 1974-83 (app. C). In the other 4 years, the average income of households with farm self-employment income was 2-7 percent higher than the average income of families without this source of income.

CONCLUSIONS

Of the 87.2 million households in the United States in 1984, about 2.6 percent operated farms. Farm operator households are a financially diverse group, as are the farms they operate. In particular, farming households are largely concentrated at both extremes of the income distribution. Much of the analysis in this report on the income of farming households is for a single year, 1984, a financially stressful year for many households. Therefore, many distributional conclusions are limited to 1 year's results. Evidence suggests, however, that the distribution of income among farming households has become more unequal over time, largely because of the structural changes which have occurred in agriculture.

Production is concentrated in a small subset of farms, and a sizable proportion of operator households are mainly dependent on off-farm sources of income and operate farms largely to maintain a rural residence or to take advantage of investment opportunities or tax breaks. However, about 65 percent of farm operator households are dependent on agriculture for a living, and more than half of these are in a financially secure position. Others have been seriously affected by weak demand and low prices for agricultural commodities. The status of this latter group of farm operator households is a special policy concern during the current period of financial stress in the sector. Approximately 30 percent of all farm households fall into the category of having farming as a major occupation and having money incomes below $10,610 in 1984. Again, this largely 1-year analysis in which permanent and transitory components are not identified separately does not allow us to determine if those households' incomes are an aberration for them or if they will eventually be forced to leave agriculture. As a group, those households have a relatively large debt load indicating that their financial difficulties are generally of a more long-term nature than simply a single low-income year.

Farm-nonfarm parity concerns suggest an income comparison of farm and nonfarm households. Although the policy interest has theoretically been on farm households who operate farms, data have usually not been available. Instead proxy data for those who live on farms, or whose major occupation is farming, or who earn farm self-employment income from unincorporated farms have been used. In some cases, the USDA estimate of farm operator household income has been incorrectly compared with an inconsistently defined estimate of nonfarm households' income. However, the USDA estimate can be altered, largely by removing nonmoney components, to allow a more consistent income definition. The farm-nonfarm household income gap has been narrowing somewhat over time but farm operator household incomes are still generally lower. Average incomes mask the differences in the distribution of income for farm and nonfarm households. Farm households have a higher proportion of households in both the lowest and the highest income groups than do nonfarm households. Another difference in the financial well-being of farm and nonfarm households is evident in the income-to-equity relationships. Farm households

tend to have a smaller income-to-equity ratio than do nonfarm households which means they tend to have more wealth at lower income levels or, conversely, that their wealth tends to earn them less income than nonfarm households.

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ENDIX A--DESCRIPTION OF POPULATIONS ASSOCIATED WITH FARMS

Concept	Definition	Data source 1/	Population and income: Year	Population	Average household money income	Ratio of inc for farm and farm popula
m operator useholds 2/	Those households which include major decision-makers of farming operations	USDA	1984	2,328,000	$23,658	3/ 0.86
		FCRS	1984	1,693,940	20,191	3/ .74
m resident useholds	Those who are permanent residents on farms	CPS	1983	1,818,000	21,534	.84
m self-employment come families	Those whose householders earn income from unincorporated farms as operators or as landlords receiving farm share rental income	CPS	1983	1,698,000	26,580	.93
ming occupation useholds	Those whose householders' job held the longest during the year was as operators or managers	CPS	1983	1,121,000	19,009	.63
edule F filers ole proprietors)4/	Those who earn income from sole proprietor farms	IRS	1982	2,903,442	20,392	3/ .74

/ The USDA estimate is adjusted from the official published series, see text. FCRS is the Farm Costs and Returns S
A. CPS is the Current Population Survey, U.S. Department of Commerce. IRS is the Internal Revenue Service which p
cial tabulations from its Statistics of Income File.
/ By definition, there is one operator per farm. Therefore, the USDA number of operators equals the official numb
ms. The Farm Costs and Returns Survey, a USDA estimate of the number of operator households, differs from the offi
nt. Data are presented from both sources.
/ A ratio of farm income to the CPS estimate of the average U.S. household income.
/ Farms are not limited to actual or potential sales of $1,000 in commodities.

APPENDIX B--THEORIES FOR EXPLAINING INCOME DISTRIBUTION IN AGRICULTURE

Marginal productivity theory underlies many significant economic concepts including the functional distribution of income to production factors. A major postulate of this theory is product exhaustion:

$$pq = p(x_i f_i),\ i=1,\ldots n$$

where p is output price, q is output, x_i are inputs, and f_i are marginal products of inputs. Such a distribution indicates how much each factor earns in the production process. Euler's theorem shows this relationship as an identity for production functions with constant returns to scale. It was later shown that the relationship holds for all forms of the production function under longrun equilibrium conditions (20). USDA estimates a functional distribution of income in agriculture annually beginning in 1940 (25).

Only recently have general models been developed to explain the size distribution of income in the 1970's (19). Many partial theories highlight one or a few of the relevant variables associated with the lognormal distribution of incomes first described by Pareto in 1897. The ability school of income distribution theories, which predates Pareto's empirical work, postulates that income is a function of innate abilities. The implication from the simple ability theory is that incomes are distributed normally as are abilities. Since the 1890's, other researchers have expanded the ability theory to include variables that interact with ability to produce the observed lognormal distribution. Other major factors featured in theories of the size distribution of income include chance, the age structure of the population, individual choice, human capital, and wealth and inheritance.

In light of the increasing dependence of some farm households on off-farm wages and salaries over time, the traditional emphasis on human capital models seems appropriate for this subgroup of farm operator households. Human capital variables, such as formal training and experience, are probably important in explaining the distribution of farm sources of income as well. Huffman has emphasized the importance of adapting to exogenous market forces in a changing environment as a relevant concept of human capital for explaining the distribution of farm income among operators (11). The life-cycle and inheritance theories may be more important in explaining the size distribution of income for households dependent on farm sources of income or from other closely held businesses, than for all other households. This importance results from the greater ratio of other capital to human capital required to operate a farm than for all occupations in total.

APPENDIX C--AVERAGE INCOMES OF FARM SELF-EMPLOYMENT AND NONFARM FAMILIES

Year	Families with farm self-employment income			Average income of families without farm self-employment income	Ratio of a farm family to nonf family i
	Average family income	Average farm income 1/	Share of income from farming		
	---------Dollars---------		Percent	Dollars	Rati
1974	14,485	4,518	31.2	14,722	0.98
1975	15,779	4,309	27.3	15,535	1.02
1976	17,177	4,340	25.1	16,855	1.02
1977	17,776	3,723	20.9	18,286	.97
1978	21,370	5,828	27.3	20,037	1.07
1979	23,105	8,444	36.5	22,354	1.03
1980	21,721	6,851	31.5	24,035	.90
1981	21,732	4,380	20.2	25,960	.84
1982 2/	24,743	5,138	20.8	27,470	.90
1983 2/	26,580	5,545	20.9	28,696	.93

1/ Includes farm share rental income and excludes farm cash rental income.
2/ The 1982 and 1983 Current Population Surveys categorized the income of operators of incorporated as farm wage and salary income. Before that time they were included as farm self-employment income.
Source: (31) and unpublished U.S. Department of Commerce survey data.

Related Reports

Farm Income Data: A Historical Perspective by Gary Lucier, Agnes Chesley, and Mary Ahearn. May 1986; 311 pages. $15.00. This bulletin presents various economic time series relating to national, regional, and State farm income statistics. Data series for State-level cash receipts and production expenses by major components from 1949-84 are included as well as other State-level farm income components and off-farm income.

Other ERS Publications Available

Economic Indicators of the Farm Sector This periodical consists of five annual issues; averages more than 100 pages of statistics and analysis per issue. Subscription price: $19.00 domestic; $23.75 foreign. This series provides a comprehensive update on economic trends in U.S. agriculture. Topics include national and State financial summaries, production and efficiency statistics, costs of production, and an annual overview of the entire farm sector.

The National Income and Product Accounts, Estimating Farm Income by Type of Farm by Richard Simunek, Agapi Somwaru, Sandra Suddendorf, and Gary Lucier. December 1985; 60 pages. $2.00. This report identifies data limitations, advantages in estimating farm income by type of farm, and the implications of SIC-based measures. U.S. farms are becoming increasingly specialized, limiting the usefulness of traditional aggregate analysis.

A Quarterly Model of the Livestock Industry by Richard P. Stillman. December 1985; 32 pages. $2.00. This report incorporates both behavioral and biological equations to project beef, pork, and broiler quantities and prices used by outlook and situation analysts. A newly developed model for the U.S. livestock industry provides quarterly forecasts of livestock prices and quantities and is used in impact analysis where alternative scenarios are simulated and compared with the model's base forecast.

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