The Incidence of Financial Stress in Agriculture

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Farm financial experience

The advent of sharply higher interest rates in 1980 dealt a major blow to many farmers. To a great extent, in fact, severe financial problems have been concentrated among those farmers who were highly leveraged as the boom of the 1970s ended, usually because they had expanded their operations. In constant dollars, as shown on the third line of the top panel of Table 1, recent cash flow before interest payments, while down from boom peaks, has remained above the pre-boom (1970-71) level; in contrast, cash flow after interest (line 5) has been significantly lower. And, most heavily indebted farmers have fared much worse, after their relatively greater interest payments, than is indicated by these data for all farms (including landlords' share of income, assets, and debt).

Net income data shown in the middle panel of Table 1 provide further evidence of the sharp difference in farm financial experience between heavily indebted farmers and those with little or no debt. Before interest payments, income from assets (line 9) has remained above the pre-boom level; after interest payments, income from equity (line 11) has been negative. Thus heavily indebted operators have been the primary financially-troubled group of farmers. Unfortunately for lenders, this group owes much of the total farm debt.

As farm land prices have reacted to reduced earnings, diminished prospects for income growth, higher returns on alternative investments, more distress sales by financially troubled operators, and increased offerings of foreclosed property, sizable real capital losses have reversed part of the huge real capital gains of the 1970s (line 12). Real farm equity eroded at an average annual rate of 5 percent during 1980-83 (line 19).

Table 1

Farm cash flow, income, and total return in selected periods
(Data excluding farm households)
Annual average, billions of 1983 dollars (PCE deflator)

	Item		Pre-boom 1970-71	Boom I 1972-75	Recession I 1976-77	Boom II 1978-79	Recession II 1980-83
	Derivation of cash flow						
1		Gross income	130	168	157	178	158
2	Less:	Operating expenses	73	87	93	101	93
3	Equals:	Cash flow before interest	56	81	64	78	64
4	Less:	Interest	7	9	12	15	21
5	Equals:	Cash flow after interest	49	71	52	62	44
	Derivation of net income and total return						
6		Cash flow before interest	56	81	64	78	64
7	Less:	Depreciation	14	16	20	21	21
8	Less:	Imputed return to operators' labor and management	30	29	28	28	27
9	Equals:	Income from assets	12	36	16	29	17
10	Less:	Interest	7	9	12	15	21
11	Equals:	Income from equity	5	27	4	13	-4
12	Plus:	Real capital gain	14	60	73	83	-41
13	Equals:	Total real return from equity	19	86	77	97	-45
	Rates (percent)						
14	Income return to assets		1.9	4.7	1.7	2.6	1.6
15	Real capital gain on assets		1.4	6.7	7.0	6.4	-5.0
16	Total real return to assets		3.3	11.3	8.7	9.0	-3.4
17	Interest paid		6.4	7.1	7.7	8.4	10.3
18	Real rate of interest		2.5	.7	2.8	.3	4.5
19	Total real return to equity		3.5	13.5	9.9	10.8	-5.3

Data are from Agricultural Finance Databook, Board of Governors of the Federal Reserve System, September 1984, Tables 101, 112, and 122.

Impact of debt on profitability of a farm

Table 2 illustrates the joint impact of the level of debt and the rate of interest on a farmer's return to equity. The calculations assume a farm with the recent average rate of income return to assets for the farm sector, 2 percent. As shown, this was also the rate of return to equity if the farmer had no debt. If, however, he had debt equal to 20 percent of assets and paid an average interest rate of 11 percent--both near the sector averages--then his return to equity was near zero. Higher ratios of debt to assets meant losses: moderate if debt consisted mainly of old fixed-rate mortgage loans at an interest rate like 7 percent, more severe if it consisted of short-term loans at a rate like 15 percent. Thus highly leveraged operators may have had operating losses equal to a fourth or a third of their equity in each recent year while similarly situated farmers with no debt were operating profitably.

Therefore, except as noted below, heavily indebted operators are the group most likely to be financially stressed. One exception is the operators of small farms who for years have received most of their total income from off-farm sources. The section that follows indicates that over two-thirds of all farm operators (as defined by USDA and the Census Bureau) are in this group. A second exception is the operators of very large farms, most of whom are continuing to achieve very high rates of return--even higher, it will be shown, than recent interest rates. Thus, most of this small but important group of operators is not experiencing financial stress in spite of relatively high debt. In the concluding section, the financial situations of this group and of the operators with primarily off-farm income are taken into consideration in estimating the number and distribution of operators experiencing farm financial stress.

Table 2

Rate of income return to equity, by relative level and cost of debt

Ratio of debt to assets (percent)	Interest rate on outstanding debt (percent) 7	11	15
	Income return to equity (percent)		
0	2.0	2.0	2.0
10	1.4	1.0	.6
20	.8	-.2	-1.2
30	-.1	-1.9	-3.6
40	-1.3	-4.0	-6.7
50	-3.0	-7.0	-11.0
60	-5.5	-11.5	-17.5
70	-9.7	-19.0	-28.3
80	-18.0	-34.0	-50.0
90	-43.0	-79.0	-115.0

This table assumes a farm on which the rate of income return to assets is 2 percent, approximately the average for the farm sector in 1980-83. To illustrate the calculations reported here: if the farm also had the average ratio of debt to assets for the farm sector, 20 percent, and the average interest rate, 11 percent, its rate of income return to equity was -0.2 percent.

Reproduced from "A Financial Perspective on Agriculture," Federal Reserve Bulletin, January 1984, p. 9, Table 3.

Table 3 shows estimated distributions of farm operators and their assets and debt by size of farm as measured by annual sales. For example, operators with annual sales of $500,000 or more constitute 1 percent of operators, own 10 percent of total operators' assets, and owe 18 percent of total operators' debt. Operators in the higher sales classes have relatively more debt than assets, as indicated by the debt-to-asset ratios in the last column of the table. Thus operators of larger farms appear more likely to be experiencing financial stress, except for those that remain highly profitable.*

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* The analyses that follow require that 1979 Farm Finance Survey distributions of operators, assets, and debt by value-of-sales classes (with assets and debt adjusted to 1984 totals) be related to USDA distributions of 1983 off-farm and net farm income by the same value-of-sales classes. Fortunately, as shown in the table below, the Survey distribution of farms by value of sales is acceptably similar to the 1983 USDA distribution. This circumstance, which expedites the analyses that follow, occurs because the total value of cash receipts from farm marketings has not changed much since 1980 (for the five years from 1980 to 1984, USDA estimates of cash receipts are, in billions of dollars, 141, 143, 145, 139, and 144, respectively), and also because, as demonstrated by a comparison of the first two columns below, current USDA estimates show no significant shift of farms into either higher or lower value-of-sales classes between 1980 and 1983.

Size of farm Annual value of farm products sold (thousands of dollars)	Percentage distribution of farm operators reported by-- USDA, ERS, ECIFS 3-3: 1980	USDA, ERS, ECIFS 3-3: 1983	Farm Finance Survey
All farms........	100.0	100.0	100.0
500 and over.....	1.0	1.0	1.0
200 to 499.......	3.4	3.5	3.3
100 to 199.......	7.4	7.5	7.4
40 to 99.........	16.0	16.1	15.9
20 to 39.........	11.5	11.4	11.0
10 to 19.........	11.8	11.8	11.5
5 to 9...........	13.7	13.7	12.8
2.5 to 4.9.......	13.5	13.6	13.9
Under 2.5........	21.7	21.4	23.2

USDA data are from Economic Research Service, Economic Indicators of the Farming Sector: Income and Balance Sheet Statistics, 1983, ECIFS 3-3, September 1984, p. 80.

Table 3

Estimated percentage distribution of farm operators and their debt and assets, by size of farm, January 1, 1984

Size of farm Annual value of farm products sold (thousands of dollars)	Operators	Assets	Debt	Addendum: Ratio of debt to assets (percent)
All farms.......	100	100	100	24
500 and over....	1	10	18	42
200 to 499......	3	13	18	33
100 to 199......	7	16	21	30
40 to 99........	16	22	22	24
20 to 39........	11	10	7	17
10 to 19........	12	8	5	14
5 to 9..........	13	6	3	12
2.5 to 4.9......	14	6	2	10
Under 2.5.......	23	8	4	11

Estimates shown are based on data from the 1979 Farm Finance Survey, Bureau of of the Census, as tabulated by Economic Research Service, USDA, and adjusted and updated by the author. Comparison of assets and debt reported by operators in the Survey as of January 1, 1980 with estimates of these items made by USDA and the author indicated that total assets had been underreported by 18 percent, and total debt by 31 percent. During 1980-83, the value of assets covered by the Survey increased by 5 percent and the amount of debt by 27 percent, according to estimates made by USDA and the author. These adjustments thus raised debt-asset ratios above those in the original Survey results.

Although the basic adjustments involved making Survey asset and debt totals consistent with totals in the USDA's Balance Sheet of the Farming Sector, there are several significant differences between the Balance Sheet and the adjusted Survey data shown in this report. Most importantly, Balance Sheet data are for farm operators and landlords combined. For this report, operators' percentage share of each Balance Sheet asset and debt category was assumed to be the same as the share found in the Survey. Also, because the Survey did not cover household equipment and furnishings included in the Balance Sheet, a proportional adjustment was made in non-real-estate debt, which reduced total farm debt as of January 1, 1984 to $204 billion--of which $187 billion was owed by operators and $17 billion by landlords. Assets in the Survey and this report further differ from the Balance Sheet in that the Survey covered additional financial assets--bonds, corporate stock, "money owed to you," cash value of life insurance, and deposits in savings and loan associations--which the author estimated to total $47 billion by 1984. Finally, the author's published series of bank deposits owned by farmers--estimated to total $39 billion in 1984--were used instead of the Balance Sheet series.

The impact of off-farm income

In Table 4 below, the distribution of operators' debt by value-of-sales classes is compared with that of operators' debt. The distributions are nearly exact opposites. At the extremes, operators of the very large farms have 18 percent of the debt but only 2 percent of the off-farm income; operators of the smallest farms owe only 4 percent of the debt but have 27 percent of the off-farm income.

Table 5 compares the amounts of debt with operators' off-farm and farm income. Aggregates are compared in the top panel, and averages per operator in the lower panel. Clearly, in the value-of-sales classes below

Table 4

Estimated percentage distribution of farm operators and their assets, debt, and off-farm income, by size of farm, January 1, 1984

Size of farm Annual value of farm products sold (thousands of dollars)	Operators	Assets	Debt	Off-farm income
All farms.......	100	100	100	100
500 and over....	1	10	18	2
200 to 499......	3	13	18	3
100 to 199......	7	16	21	5
40 to 99........	16	22	22	10
20 to 39........	11	10	7	9
10 to 19........	12	8	5	12
5 to 9..........	13	6	3	16
2.5 to 4.9......	14	6	2	16
Under 2.5.......	23	8	4	27

Operators, assets, and debt are as of January 1, 1984, estimated as described in the note to Table 3.
Off-farm income data are USDA estimates for 1983, from ERS ECIFS 3-3, p. 89.

Table 5

Off-farm income of farm operators compared with their total income and debt

Size of farm Annual value of farm products sold (thousands of dollars)	Off-farm income	Net farm income before interest payments	Off-farm income as percentage of total income before interest	Debt	Off-farm income as percentage of debt
	Total, billions of dollars		Percent	Total, billions of dollars	Percent
All farms.......	41.0	46.5	47	187	22
500 and over....	.7	16.8	4	33	2
200 to 499......	1.2	8.5	12	34	4
100 to 199......	2.1	8.6	20	38	5
40 to 99........	4.3	8.2	34	42	10
20 to 39........	3.7	2.1	63	13	28
10 to 19........	5.0	.9	84	9	57
5 to 9..........	6.5	.6	92	6	104
2.5 to 4.9......	6.5	.2	97	5	143
Under 2.5.......	11.0	.5	96	7	159
	Average per operator, thousands of dollars		Percent	Average per operator, thousands of dollars	Percent
All farms.......	17	20	47	79	22
500 and over....	29	706	4	1,384	2
200 to 499......	15	105	12	428	4
100 to 199......	12	49	20	222	5
40 to 99........	11	22	34	112	10
20 to 39........	14	8	63	51	28
10 to 19........	18	3	84	32	57
5 to 9..........	20	2	92	21	104
2.5 to 4.9......	20	1	97	14	143
Under 2.5.......	22	1	96	13	159

Income data are USDA estimates for 1983, from ERS ECIFS 3-3, pp. 88-89 and 92-93. Interest payments are imputed as 10 percent of operators' debt.

Debt is as of January 1, 1984, estimated as described in the note to Table 3.

$40,000, net farm income on most farms does not now service even a fraction of the total debt. Nor did it in 1979, as USDA data demonstrate. Thus, on most of these small farms, any financial stress now being experienced can hardly be regarded as caused by lack of farm income, as such income was not there when debt was incurred. On farms with sales under $10,000, which represent one-half of all farms, operators' annual off-farm income exceeds their total farm debt, most of which is really home mortgage and consumer debt.

At the other extreme, on very large farms, annual off-farm income is equal to only 2 percent of outstanding debt. The off-farm income of $29,000 per operator looks large until one notes that, assuming an interest rate of 10 percent (the average rate paid by the farm sector in 1983), these operators face annual interest charges averaging $138,000. On the remaining farms with sales from $40,000 to $499,999, average off-farm income is equal to two-thirds of annual interest charges of operators. Undoubtedly, however, such income is a much smaller fraction of the interest charges faced by the more highly leveraged operators in these sales classes.

The high profitability of very large farms

Farms with annual sales of $500,000 or more have remained very profitable in spite of the relatively high debt-asset ratio of their operators, which averages 42 percent. This section seeks to develop better understanding of the reasons for their high profitability, in part to establish confidence in the reality of these income data which suggest a very low incidence of financial stress among these farms.

Table 6 indicates that the very large farms generate a relatively high dollar volume of sales per dollar of assets. These farms represent only 10 percent of operators' assets, but generate 29 percent of gross sales. This relationship undoubtedly helps these operators to garner 48 percent of net farm income.

Table 6

Estimated percentage distribution of farm operators and their assets, debt, and gross and net farm income, by size of farm, January 1, 1984

Size of farm Annual value of farm products sold (thousands of dollars)	Operators	Assets	Debt	Gross cash farm income	Net farm income
All farms.......	100	100	100	100	100
500 and over....	1	10	18	29	48
200 to 499......	3	13	18	19	19
100 to 199......	7	16	21	19	17
40 to 99........	16	22	22	20	15
20 to 39........	11	10	7	6	3
10 to 19........	12	8	5	3	0
5 to 9..........	13	6	3	2	0
2.5 to 4.9......	14	6	2	1	-1
Under 2.5.......	23	8	4	1	-1

Operators, assets, and debt are as of January 1, 1984, estimated as described in the note to Table 3.
Farm income data are USDA estimates for 1983, from ERS ECIFS 3-3, pp. 85 and 88.

Therefore, as shown in Table 7, the estimated average rate of income return to operators' assets on very large farms is 18 percent, far above the average interest rate of 10 percent probably being paid on outstanding debt. Consequently, the income return to equity is estimated at 24 percent; thus, high debt levels pose no problems for most operators of these farms.

In addition to probable economies of scale, the high profitability of very large farms stems from the composition of their products and expenses, which differ significantly from those of smaller farms. On the very large farms, cattle, poultry, vegetables, and fruit production provide above-average shares of cash receipts, whereas the shares of receipts from corn, soybeans, and wheat are far below the average for all farms. The relative importance of certain production expenses also differs greatly from that on other farms, and confirms that the very large farms as a group are not operating large acreages of grain crops. Farms with sales of $500,000 or more in 1982 accounted for 22 percent of total production expenses on all farms. Expense categories that were significantly below that average in importance on these farms included:

	Percentage of total for all farms
Machinery operation..............	8
Real estate taxes................	10
Rent to nonfarm landlords........	11
Fuel and oil.....................	13
Fertilizer.......................	13
Interest on real estate debt.....	16
Seed.............................	16

Expense categories with above-average importance included:

Cotton ginning...................	34
Feed.............................	40
Livestock purchases..............	55
Nursery purchases................	58

Evidently, highly profitable large-scale farm operations included poultry production and cattle feeding using purchased grain and proteins as well as production of fruits and vegetables under contracts or marketing orders.

Table 7

Estimated rates of income return to assets and equity of farm operators

Size of farm Annual value of farm products sold (thousands of dollars)	Assets	Debt	Equity	Income from assets: Amount	Income from assets: As percentage of assets	Income from equity: Amount	Income from equity: As percentage of equity
	Total, billions of dollars			Total, billions of dollars	Percent	Total, billions of dollars	Percent
All farms.......	778	187	591				
500 and over....	79	33	46	14.4	18.2	11.1	24.0
200 to 499......	101	34	67	6.3	6.3	2.9	4.4
100 to 199......	127	38	89	5.4	4.2	1.5	1.7
40 to 99........	171	42	129	2.9	1.7	-1.2	-1.0
20 to 39........	75	13	62				
10 to 19........	61	9	52				
5 to 9..........	50	6	44				
2.5 to 4.9......	48	5	44				
Under 2.5.......	66	7	59				
	Average per operator, thousands of dollars			Average per operator, thousands of dollars	Percent	Average per operator, thousands of dollars	Percent
All farms.......	330	79	251				
500 and over....	3,315	1,384	1,931	602	18.2	464	24.0
200 to 499......	1,280	428	852	80	6.3	37	4.4
100 to 199......	733	222	511	31	4.2	9	1.7
40 to 99........	457	112	345	8	1.7	-3	-1.0
20 to 39........	293	51	242				
10 to 19........	225	32	193				
5 to 9..........	165	21	145				
2.5 to 4.9......	147	14	133				
Under 2.5.......	120	13	107				

Assets, debt, and equity are as of January 1, 1984, estimated as described in the note to Table 3.

Income from assets and income from equity are returns in 1983, estimated as shown in Appendix A.

Incidence of farm financial stress

The preceding analyses have ruled out the existence of any significant incidence of farm financial stress among the smaller farms, on which off-farm income is dominant, as well as among very large farms, which tend to be highly profitable. There is, of course, some overlap between these groups and the remaining 625,000 farms with annual sales from $40,000 to $499,999, on which operators are likely experiencing farm financial stress if they are heavily indebted. For example, heavily indebted operators of very large cash grain farms may be experiencing financial stress, while similarly leveraged operators engaged in contract or specialty-crop production on somewhat smaller farms may have high profitability. In the same manner, some operators with sales over $40,000 may have relatively large off-farm income, while some with smaller farm operations may be dependent primarily on their farm income.

If such overlap is in large part offsetting, the proportion of heavily-indebted operators on farms with annual sales from $40,000 to $499,999 may indicate the relative incidence of farm financial stress. In the absence of dominant off-farm income or exceptional profitability, Table 2 suggested that operators with debt-asset ratios above 40 percent may be financially stressed. In Table 8, operators with this level of debt on farms with sales from $40,000 to $499,999 are bracketed. They constitute about 9 percent of all operators, own about 14 percent of total operators' assets, and owe about 39 percent of total operators' debt. Thus they number about 210,000 operators, own assets valued at about $107 billion--a tenth of total farm assets--and owe about $73 billion, one-third of total farm debt.*

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* Total farm assets and debt include those of landlords, who owned 33 percent of farm assets reported in the 1980 survey, including 39 percent of farm real estate. They owed 13 percent of total farm real estate debt and 2 percent of farm non-real-estate debt.

Table 8

Estimated percentage distribution of all farm operators and their debt and assets, by relative debt level and size groups, January 1, 1984

Size of farm Annual value of farm products sold (thousands of dollars)	Ratio of farm operator debt to assets (percent) 0-10	11-40	41-70	71 and over	
	Percentage of grand total				
	Operators				
500 and over	.2	.4	.3	.2	
200 to 499	.7	1.2	.8	.6	
100 to 199	1.9	2.8	1.5	1.2	8.8
40 to 99	6.0	5.2	2.7	2.1	
20 to 39	5.4	3.2	1.3	1.0	
10 to 19	6.9	2.6	1.1	.9	
5 to 9	9.0	2.1	1.1	.7	
2.5 to 4.9	10.1	2.3	.9	.6	
Under 2.5	17.4	3.7	1.5	.7	
	Assets				
500 and over	2.3	3.8	2.3	1.8	
200 to 499	3.7	4.9	2.7	1.6	
100 to 199	4.9	6.9	2.9	1.6	13.8
40 to 99	9.6	7.4	3.2	1.7	
20 to 39	5.5	2.8	.9	.5	
10 to 19	5.1	1.8	.6	.3	
5 to 9	4.6	1.1	.5	.2	
2.5 to 4.9	4.7	1.0	.3	.1	
Under 2.5	6.1	1.6	.5	.2	
	Debt				
500 and over	.4	4.0	5.2	8.1	
200 to 499	.5	5.2	6.1	6.3	
100 to 199	.8	7.1	6.5	6.3	39.2
40 to 99	1.2	7.2	7.2	6.8	
20 to 39	.5	2.7	2.0	1.9	
10 to 19	.4	1.6	1.4	1.3	
5 to 9	.3	1.0	1.0	1.0	
2.5 to 4.9	.2	.9	.8	.6	
Under 2.5	.3	1.5	1.2	.7	

See note to Table 3.

When bankers and other observers in the midwest comment on farm financial conditions, their remarks are probably based mainly on the experience of operators in the group with annual sales from $40,000 to $499,999. Thus the distributions shown in Table 9 may reflect the farm universe as perceived in the midwest. One-third of this group has relatively heavy debt and owes nearly two-thirds of the debt of the group (but, as noted earlier, only one-third of the total farm debt of all operators and landlords). The larger operators within the group are more likely to be heavily indebted. Nevertheless, because the smaller farms make up three-fifths of the group, over half of its heavily indebted operators are on smaller farms.

Table 9

Estimated percentage distribution of operators and their debt and assets on farms with annual sales from $40,000 to $499,999, by relative debt level and size groups, January 1, 1984

Size of farm Annual value of farm products sold (thousands of dollars)	Ratio of farm operator debt to assets (percent) Little or no debt (0-10)	Moderate debt (11-40)	Heavy debt (41 and over)	Total
All farms in this group:		Percentage of total		
Operators	32	35	33	100
Assets	36	38	27	100
Debt	4	32	64	100
	Operators, percentage of total in size class			
Large (200 to 499)	22	35	43	100
Mid-sized (100 to 199)	26	38	36	100
Small (40 to 99)	38	33	30	100
	Operators, percentage of total in debt class			
Large (200 to 499)	8	13	16	13
Mid-sized (100 to 199)	22	31	30	28
Small (40 to 99)	69	56	54	60
	100	100	100	100

See note to Table 3.

Appendix A. Derivation of estimated rates of income return to assets and equity

Appendix Table A-1

Derivation of rate of income return to equity of farm operators

Size of farm Annual value of farm products sold (thousands of dollars)	Billions of dollars: Net farm income	Less: Imputed return to operators'-- Labor	Less: Imputed return to operators'-- Management	Equals: Income from equity	Equity	Rate of income return to equity (percent)
500 and over....	13.5	.2	2.2	11.1	46	24.0
200 to 499......	5.2	.8	1.4	2.9	67	4.4
100 to 199......	4.7	1.8	1.4	1.5	89	1.7
40 to 99........	4.1	3.8	1.5	-1.2	129	-1.0

Net farm income is USDA estimate for 1983, from ERS ECIFS 3-3, p. 88.
Income from equity is derived by starting with USDA estimates of net farm income in 1983 and subtracting an imputed return to operators' labor of $10,000 per operator (2,500 hours at $4 per hour) and an imputed return to operators' management work equal to 5 percent of gross cash farm income in 1983.
Equity is as of January 1, 1984, estimated as described in the note to Table 3.

Appendix Table A-2

Derivation of rate of income return to assets of farm operators

Size of farm Annual value of farm products sold (thousands of dollars)	Billions of dollars: Income from equity	Plus: Imputed interest on debt	Equals: Income from assets	Assets	Rate of income return to assets (percent)
500 and over....	11.1	3.3	14.4	79	18.2
200 to 499......	2.9	3.4	6.3	101	6.3
100 to 199......	1.5	3.8	5.4	127	4.2
40 to 99........	-1.2	4.2	2.9	171	1.7

Income from assets is derived by starting with income from equity estimated in Table A-1 and adding imputed interest payments equal to 10 percent of operators' debt.
Assets and debt are as of January 1, 1984, estimated as described in the note to Table 3.

Appendix B. Other measures of the relative debt burden of farm operators

In evaluating the relative debt burden of farm operators, this report has stressed the importance of considering differences among farmers in the relative importance of off-farm income and in the profitability of their farming operations. In spite of these complexities, a single summary statistic of relative debt burden is frequently sought. Most often, total farm debt has been compared with operators' net farm income.

Unfortunately, the comparison of these two well-known and readily available statistics is flawed. Total farm debt includes about $17 billion of debt owed by landlords, while operators' net farm income is measured after the payment of over $4 billion in net cash and share rent to landlords.

Table B-1 presents a more valid comparison, in which only operators' debt is compared with operators' net farm income. In 1983, that income was 15 percent of year-end debt. Inversely, it would take 6.7 years of such income to repay outstanding debt, if all income were used for that purpose.

The same ratios differ materially among the three groups of operators discussed in this report. The net farm income of the operators of very large farms was equal to 41 percent of their debt, which would repay all debt in 2.5 years. For operators with annual sales between $40,000 and $499,999, dependent mainly on farm income, the respective ratios averaged 12 percent and 8.2 years. For operators with annual sales below $40,000, ratios averaging 1 percent and 96 years, respectively, are essentially devoid of meaning, as this groups looks to off-farm income for its sustenance and debt service.

The comparison shown in Table B-1 can easily be amended to include data on off-farm income. If this is done, however, it becomes even more important to separate farmers into at least the three groups outlined above. With off-farm income included, the ratios calculated for all operators would be even more misleading than those calculated using only farm income.

Appendix Table B-1

Estimated debt of farm operators compared with their net farm income

Size of farm Annual value of farm products sold (thousands of dollars)	Billions of dollars		Net farm income as percentage of debt	Ratio of debt to net farm income
	Debt	Net farm income		
All farms.......	187	27.8	15	6.7
500 and over....	33	13.5	41	2.5
200 to 499......	34	5.2	15	6.5
100 to 199......	38	4.7	12	8.1
40 to 99........	42	4.1	10	10.3
20 to 39........	13	.8	6	16.5
10 to 19........	9	.1	1	120.0
5 to 9..........	6	.0	-1	*
2.5 to 4.9......	5	-.2	-5	*
Under 2.5.......	7	-.2	-3	*

* Not meaningful.

Debt is as of January 1, 1984, estimated as described in the note to Table 3.
Net farm income is USDA estimate for 1983, from ERS ECIFS 3-3, p. 88.

References

1979 Farm Finance Survey, Volume 5, Part 6, 1978 Census of Agriculture, AC78-SR-6, Bureau of the Census, U.S. Department of Commerce, July 1982.

A special tabulation of Farm Finance Survey data by farm operators' debt-asset ratio provided the basis for much of this report, as described in the note to Table 3. In this Census publication, general Survey information is given on pages VII-XXI and report forms are shown on pages A-1 to A-11. Unadjusted data similar to the special tabulation, but limited to number of operators, are presented on page 210.

Economic Indicators of the Farm Sector, ERS, U.S. Department of Agriculture.

Farm Sector Review, 1983, ECIFS 3-2, August 1984.

Differences among value-of-sales classes in the relative importance of various production expenses, cited on page 12 of this report, are shown on page 54; differences in products produced are presented on page 76.

Income and Balance Sheet Statistics, 1983, ECIFS 3-3, September 1984.

Number of farms by value-of-sales classes is shown on page 80. Farm and off-farm income by value-of-sales classes are presented on pages 85-95.

Related publications by the author

"A Financial Perspective on Agriculture," Federal Reserve Bulletin, Jan. 1984.

Presents an overview of the profitability of agriculture and the pricing of farmland, the recent problems of indebted farmers, and the experience of rural banks. The estimates and discussion of the incidence of farm financial stress are superseded by those in this report. Estimates of aggregate farm profitability are updated by Table 1 in this report and by the quarterly Agricultural Finance Databook. Data on experience of rural banks are updated by Agricultural Banking Experience (see below).

Farm Wealth: Origins, Impact, and Implications for Public Policy, W. I. Myers Memorial Lecture, A.E. Res. 83-40, Department of Agricultural Economics, Cornell University, June 1984.

Discusses the pricing of farm assets and its implications for public attitudes and policy toward current farm financial difficulties. The Appendix describes in detail the derivation of income from assets and of total return to equity, shown in Table 1 of this report.

An Overview of Agricultural Banking Experience, Financial Stress in Agriculture Workshop, Kansas City, Missouri, October 22, 1984, 15 pp.

Agricultural Banking Experience, Financial Stress in Agriculture Workshop, Kansas City, Missouri, October 22, 1984, 48 pp. (historical and state data).

Agricultural Finance Databook, Statistical Release E.15 (quarterly), Board of Governors of the Federal Reserve System, Washington, D.C.