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F. Larry Leistritz, Arlen G. Leholm, Steve H. Murdock, and Rita R. Hamm, North Dakota State University and Texas A&M University

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INTRODUCTION

Many American farmers are facing their most severe financial crisis since the 1930s. An unprecedented proportion of farmers are experiencing financial stress and may be forced to quit farming within the next five years as a result of low commodity prices, high interest rates, and falling land values.

The U.S. Department of Agriculture [5] estimates that nearly one-third of the nation's commercial farms (i.e., those with annual sales over $40,000) are experiencing financial difficulties as evidenced by their high debt load and/or negative net cash flow. This development is particularly critical because commercial farms account for about 90 percent of all farm sales, although they make up only 34 percent of the nation's farms. Financially stressed farms tend to be concentrated in the Corn Belt, Northern Plains, and Great Lakes states[1]--areas which have recently experienced substantial declines in land values [5]. The areas in which financially stressed farmers are concentrated tend also to be ones where the economic dependence of rural communities on agriculture is quite high.

A rapid increase in the number of farm failures is likely to lead to a substantial decline in the total number of farms and farm families in many rural areas. A decline in farm numbers could, in turn, have very serious implications not only for the affected farm families but also for agribusiness firms, for the entire trade and service sector in many agricultural trade centers, and for such public services as primary and secondary schools. The magnitude of such effects has been difficult to estimate, however, because of the lack of specific information concerning the socioeconomic characteristics of financially troubled farmers.

This paper presents the results of a study designed to identify key characteristics of farm operators and their families (particularly those

[1]Corn Belt is defined here as the states of Illinois, Indiana, Iowa, Missouri, and Ohio; Northern Plains comprises Kansas, Nebraska, and North and South Dakota; Great Lakes states are Michigan, Minnesota, and Wisconsin.

whose current financial status suggests they are vulnerable to being displaced from farming) and thus to provide insights concerning (1) adjustments likely to be faced by the affected farm operators and their families and (2) impacts likely to be experienced by agriculturally dependent rural communities. Specific characteristics examined include the following:

1. Financial characteristics, such as levels of assets, debt, and income

2. Demographic characteristics, such as age, marital status, family size, and education

3. Employment history and vocational skills and preferences

Information concerning these characteristics was obtained during March and April of 1985 from a telephone survey of randomly selected farm operators in North Dakota and Texas. Initial screening questions in these interviews were used to ensure that all respondents were less than 65 years old, were operating a farm, considered farming to be their primary occupation, and sold at least $2,500 of farm products in 1984. A total of 1,953 farmers completed the survey (933 in North Dakota and 1,020 in Texas) for a response rate of 75 percent. A comparison of the survey data with the 1982 Census of Agriculture revealed a close correspondence with those farm and ranch operations in the respective states whose operators consider farming to be their principal occupation.

CHARACTERISTICS OF FARM OPERATORS

The characteristics of North Dakota and Texas farm operators who responded to the survey are summarized in this section.[2] The summary is organized into three major parts which describe financial, demographic, and employment characteristics, respectively. A subsequent section of the paper then discusses the implications of these characteristics with respect to likely impacts of the current farm financial situation on farm operators and rural communities.

Financial Characteristics

The financial characteristics of North Dakota farm and ranch operators surveyed are shown in Table 1. Of the North Dakota farmers, 79 percent had gross farm incomes of $40,000 or more in 1984, compared to 69.5 percent in Texas. About 72 percent of the North Dakota farms had gross incomes in the range of $40,000 to $250,000, and 54 percent of Texas farms fell into this range. Net cash farm income is gross farm income less gross

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[2]This paper highlights results from a more extensive analysis. For more detailed information, see [7, 8, 10]. Other personnel contributing to this study include Harvey Vreugdenhil and Brenda Ekstrom of North Dakota State University and Don Albrecht and John Thomas of Texas A&M University.

TABLE 1--Gross Farm Income, Net Cash Farm Income, Total Assets, Total Debt, and Debt-to-Asset Ratio of North Dakota and Texas Farmers, 1984

Item	Units	North Dakota	Texas
Gross farm income			
Average	Dollars	105,317	147,907
Distribution:			
Less than $40,000	Percent	21.1	30.5
$40,000 to $99,999	Percent	40.1	28.8
$100,000 to $249,999	Percent	31.6	25.5
$250,000 to $499,999	Percent	5.1	9.3
$500,000 and over	Percent	2.1	5.8
Net cash farm income			
Average	Dollars	14,897	13,095
Distribution:			
Negative	Percent	24.0	49.8
$0 to $9,999	Percent	21.2	21.0
$10,000 to $19,999	Percent	24.5	9.2
$20,000 to $49,999	Percent	23.4	13.4
$50,000 to $99,999	Percent	5.9	4.7
$100,000 and over	Percent	1.0	2.1
Total assets			
Average	Dollars	423,042	909,605
Distribution:			
$0 to $49,999	Percent	4.4	3.8
$50,000 to $99,999	Percent	8.7	8.8
$100,000 to $249,999	Percent	31.2	26.2
$250,000 to $499,999	Percent	32.6	28.2
$500,000 to $999,999	Percent	18.2	21.2
$1,000,000 to $1,999,999	Percent	3.2	6.5
$2,000,000 and over	Percent	1.7	5.3
Total debt			
Average	Dollars	139,870	226,646
Distribution:			
No debt[a]	Percent	17.3	25.2
$1 to $49,999	Percent	25.2	28.7
$50,000 to $99,999	Percent	18.6	16.8
$100,000 to $249,999	Percent	23.9	17.3
$250,000 to $499,999	Percent	10.4	8.5
$500,000 to $999,999	Percent	3.9	2.5
$999,999 and over	Percent	0.7	1.0
Debt-to-asset ratio			
Average[a]	Percent	33.1	30.6
Distribution:			
No debt	Percent	16.7	21.4
1-40 percent	Percent	45.2	54.3
41-70 percent	Percent	23.4	13.9
71-100+ percent	Percent	14.7	10.4

[a]Percentages differ because of differing numbers of respondents to different questions.

cash farm expenses and depreciation. Net cash farm income does not take into account principal payments or changes in inventory of grain and livestock products during the year. Although net cash farm income averaged $14,897 in North Dakota and $13,095 in Texas, 24 percent of farm operators in North Dakota and about 50 percent of those in Texas experienced negative net cash farm income in 1984.

The total debt and total asset information obtained from the respondents represents a snapshot of the financial picture of North Dakota and Texas farmers and ranchers as of January 1, 1985. Respondents' estimates of the value of their total assets as of January 1, 1985 averaged $423,042 for North Dakota and $909,605 for Texas. Corresponding figures for average debt were $139,870 and $226,646. This translates into total-debt to total-asset ratios of about 33 percent for North Dakota and 31 percent for Texas. That is, the average North Dakota operator was carrying about 33 cents of debt for every dollar of assets he controlled, and the Texas operator 31 cents.

One of the better indicators of the financial health of a farm business is the debt-to-asset ratio. The larger this ratio, the greater the probability that the farmer will experience cash flow difficulties during periods of low returns and high interest rates such as we have witnessed during the 1980s. At current prices, input costs, and asset values, most commercial farms begin to experience difficulty meeting principal repayment commitments at debt-to-asset ratios of about 40 percent [1, 5, 6, 7]. This appears to be particularly true for the cash grain, general livestock, and dairy farms that dominate in the Corn Belt, Great Lakes, and Great Plains states [5]. A more critical point is reached when the debt-to-asset ratio exceeds 70 percent. Above this point, most farms have difficulty meeting even their interest payments and other current expenses. Thus, it appears that many producers with debt-to-asset ratios in the 40 to 70 percent range and most of those with ratios over 70 percent face severe financial pressures.

Examination of Table 1 reveals that 23.4 percent of North Dakota farm operators had debt-to-asset ratios between 40 and 70 percent while 14.7 percent had ratios over 70 percent. Corresponding figures for Texas are 13.9 and 10.4 percent. Thus, about 38 percent of the North Dakota producers and 24 percent of those in Texas had debt-to-asset ratios in the ranges generally associated with considerable financial stress.

In order to assess the relationship between the debt-to-asset ratio and the cash flow situation of North Dakota farm operators in 1984, two simulations were performed using the survey data. In the first simulation, family living expenses were subtracted from total farm family income (i.e., net cash farm income plus all off-farm income). Some farm operators did not provide estimates of family living expenses while others gave estimates which seemed unrealistically low. In order to contend with this problem, minimum levels of family living expenses were estimated based on information obtained through the Farm Financial Analyst Program of the North Dakota Cooperative Extension Service. These minimum levels of family living expenses were $6,000 for a single individual, $8,000 for a two-person household, and $12,000 for a household of three or more. These values were applied in those cases where no estimate of family living

expenses was supplied or where the respondent's estimate was less than these values. This simulation provides a measure of the ability of farm families to meet immediate cash flow needs.[3]

The second simulation consisted of subtracting both family living expenses and principal payments from total farm family income. Principal payments were estimated to be 20 percent of intermediate-term debt plus 5 percent of long-term debt (equivalent to assuming 5-year repayment for outstanding intermediate-term loans and 20-year repayment for long-term loans). This simulation measures the ability of farm families to meet both current expenses and debt repayment demands.

The results of these two simulations are summarized by debt-to-asset ratio categories in Table 2. For farm operators with no debt, about 20 percent appear to be experiencing problems in meeting immediate cash flow needs. The percentage of operators whose total family income is less than their living expenses rises to 36 percent for operators with debt-to-asset ratios in the range of 1 to 40 percent, to 54 percent for those with debt-to-asset ratios of 41 to 70 percent, and to 60 percent for those with debt-to-asset ratios exceeding 70 percent. Considering the entire group of farm operators surveyed, 41 percent had levels of total family income which were insufficient to cover family living expenses.

When principal payments were taken into account (simulation 2), more than half of the operators surveyed had income levels insufficient to cover operating costs, family living expenses, and principal payments (Table 2). Of those with debt-to-asset ratios exceeding 40 percent, more than 80 percent could not cover principal payments in addition to their other expenses. It has been estimated that $375 million would have been needed in North Dakota alone to offset the shortfall experienced by these farm operators in 1984.

Because of the key role of the debt-to-asset ratio as an indicator of financial stress, the next two sections present comparisons of various demographic and employment characteristics of farm families by debt-to-asset ratio categories.

Demographic Characteristics

Selected demographic characteristics of North Dakota farm and ranch operators are summarized by debt-to-asset ratio in Table 3. Examination of Table 3 reveals that the age of the operator and his debt-to-asset

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[3]It should be noted that the simulations reported here are not, strictly speaking, cash flow analyses because depreciation expenses, as well as cash costs, are subtracted in calculating net cash farm income. The conclusion that farm families whose total family income is not adequate to cover family living costs are likely to experience cash flow problems appears to be warranted, however; although depreciation costs can be deferred in the short term, they ultimately must be covered. Further, the analysis presented here is conservative in that it ignores income and social security tax payments.

Table 2--Total Farm Family Income Less Family Living Expenses and Principal Payments by Debt-to-Asset Ratio for North Dakota Farmers

Category	Units	Debt-to-Asset Ratio				Total
		No Debt	1%-40%	41%-70%	71%-100%	
Simulation 1						
Total farm family income less family living expense:						
Average	Dollars	30,023	13,243	701	-5,258	10,102
Distribution:						
Less than -$4,999	Percent	11.6	24.8	38.5	48.4	29.3
-$4,999 to 0	Percent	8.2	11.1	15.1	11.7	11.7
0 to $4,999	Percent	10.2	16.0	13.2	10.2	13.5
$5,000 to $19,999	Percent	25.2	21.0	22.0	21.9	22.1
$20,000 and over	Percent	44.9	27.1	11.2	7.8	23.5
Simulation 2						
Total farm family income less family living expense and principal payments:						
Average	Dollars	30,023	4,909	-19,510	-31,496	-2,075
Distribution:						
Less than -$4,999	Percent	11.6	38.0	72.2	83.6	48.3
-$4,999 to 0	Percent	8.2	13.2	8.3	5.5	9.9
0 to $4,999	Percent	10.2	11.9	7.3	2.3	9.2
$5,000 to $19,999	Percent	25.2	16.7	7.8	7.0	14.7
$20,000 and over	Percent	44.9	20.3	4.4	1.6	18.0

ratio are strongly associated. Of the operators with no debt, 60.5 percent are over 55 years of age, and 82 percent are over 45. On the other hand, 67 percent of those with debt-to-asset ratios over 70 percent are under 45 years of age, and 63 percent of operators with debt-to-asset ratios between 40 and 70 percent are less than 45 years old. A similar relationship is revealed when the debt-to-asset ratio is compared with the year the producer started farming. Of the operators with no debt, about 74 percent began farming before 1965 while about 64 percent of those with debt-to-asset ratios greater than 70 percent began farming after 1969.

Recent surveys of Texas and Ohio farmers suggest that these patterns may be relatively widespread. In Texas, 60.5 percent of operators with no debt were over 55 years of age, and 86 percent were over 45 [10]. In contrast, 44 percent of the operators with debt-to-asset ratios over 70 percent, and 60 percent of those with ratios between 40 and 70 percent were less than 45 years old. Among the Ohio farmers surveyed, half of those who were less than 45 years old reported debt-to-asset ratios exceeding 40 percent [9]. For operators less than 35 years old, the average

Table 3--Selected Demographic Characteristics of North Dakota Farmers by Debt-to-Asset Ratio Categories

Item	Units	Debt-to-Asset Ratio				Total
		No Debt	1%-40%	41%-70%	71%-100%	
Age of respondent:						
Less than 25	Percent	2.7	2.3	3.4	5.4	3.1
25-34	Percent	8.2	17.1	29.3	33.1	20.8
35-44	Percent	6.8	24.8	30.3	28.5	23.6
45-54	Percent	21.8	29.3	24.0	20.0	25.5
55-64	Percent	60.5	26.6	13.0	13.1	27.0
Year started farming:						
1980-84	Percent	4.8	7.5	9.6	16.9	8.9
1975-79	Percent	6.8	11.0	23.6	27.7	15.7
1970-74	Percent	7.5	15.5	15.9	19.2	14.8
1965-69	Percent	6.8	9.5	13.0	9.2	9.8
1955-64	Percent	38.1	23.1	25.0	10.8	20.8
1945-54	Percent	16.3	26.6	10.6	13.1	22.5
Before 1945	Percent	19.7	6.8	2.4	3.1	7.3
Formal education of respondent:						
Did not complete high school	Percent	35.2	24.4	20.5	17.5	24.3
Completed high school	Percent	33.8	38.7	32.7	37.3	36.3
Some postsecondary education	Percent	22.8	24.7	31.2	31.0	26.8
Completed four years or more of college	Percent	8.3	12.2	15.6	14.3	12.7
Formal education of spouse:						
Did not complete high school	Percent	25.2	11.6	8.3	9.3	12.6
Completed high school	Percent	36.1	37.3	36.3	36.1	36.7
Some postsecondary education	Percent	25.1	34.1	39.6	36.1	34.3
Completed four years or more of college	Percent	13.5	17.1	15.9	18.5	16.4
Number of persons in household	Number	2.7	3.5	3.8	3.7	-
Number of children under age 19	Number	0.5	1.3	1.5	1.6	-

debt-to-asset ratio was 56 percent. Clearly, then, the incidence of financial stress is falling more heavily on the younger farmers.[4]

When the education levels of North Dakota farm operators and spouses are categorized by debt-to-asset ratio, it is evident that the more highly leveraged families (who tend to be younger than average) generally have attained higher levels of education (Table 3). For example, 44 percent of North Dakota farm operators with debt-to-asset ratios exceeding 70 percent have some postsecondary education, compared to 31 percent of operators with no debt. Similarly, of the spouses of North Dakota operators with debt-to-asset ratios exceeding 70 percent, about 55 percent have some postsecondary education, compared to 39 percent for the no debt group. In Texas, on the other hand, little relationship between debt-to-asset ratio and educational level appears to exist [10].

A characteristic of prime concern when impacts on such public services as schools are considered is the number of persons per household, and more specifically the number of children per household (Table 3). If farm families from the more highly leveraged groups are forced to leave their rural communities, the reductions in school enrollments could be substantial.

Employment Characteristics

The employment characteristics of farm operators and spouses are of interest in two respects. First, increased earnings from off-farm employment are one means by which farm families can endeavor to supplement inadequate farm income. Second, if they must leave the farm, the extent of off-farm employment experience possessed by the operator and spouse may affect their ease (or difficulty) in making the transition to the nonfarm labor market.

Current off-farm employment of North Dakota farm operators and their spouses is summarized in Table 4. Overall, about 25 percent of the operators were employed off the farm in 1984. An association between off-farm work and the farm's debt-to-asset ratio is obvious; the percentage of operators working off the farm ranges from about 16 percent for farms with no debt to 36 percent for those with debt-to-asset ratios greater than 70 percent. In addition to the operators who worked off the farm in 1984, 9.7 percent of the North Dakota farmers surveyed indicated their intention to seek off-farm employment in 1985. Examination of Table 4 suggests a strong relationship between current financial stress and the desire to obtain off-farm employment--the percentage of operators planning to look for an off-farm job ranged from less than 1 percent of those with no debt to 23 percent of those with debt-to-asset ratios greater than 70 percent.

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[4]It should be noted, however, that approximately one-fourth of North Dakota farm operators in every age category had negative net cash farm incomes in 1984 [7].

Table 4--Selected Employment Characteristics of North Dakota Farm Operators and Spouses by Debt-to-Asset Categories

Item	Units	Debt-to-Asset Ratio				Total
		No Debt	1%-40%	41%-70%	71%-100%	
Operator employed off the farm in 1984	Percent	15.7	22.3	27.9	36.2	24.6
Operator planning to look for off-farm employment in 1985 (not employed in 1984)	Percent	0.8	7.2	14.8	23.0	9.7
Spouse employed off the farm in 1984	Percent	21.0	30.3	34.6	38.0	31.0
Spouse planning to look for off-farm employment in 1985	Percent	1.0	3.9	11.9	16.4	6.8
Number of years operator has worked in a full-time nonfarm job since age 18:						
None	Percent	53.7	45.0	38.2	35.4	43.4
1-3 years	Percent	18.4	24.9	27.5	26.2	24.6
4-6 years	Percent	9.5	13.1	14.0	11.5	12.4
7-10 years	Percent	4.8	7.8	9.2	12.3	8.3
More than 10 years	Percent	13.6	9.3	11.1	14.6	11.3

Similar patterns of off-farm employment were noted for farm operator's spouses. Overall, 31 percent worked off the farm in 1984; this ranged from 21 percent of those with no debt to 38 percent of those with debt-to-asset ratios over 70 percent. In addition, about 7 percent of the spouses not already working planned to seek off-farm jobs in 1985--ranging from 1 percent of those with no debt to 16 percent of those with debt-to-asset ratios over 70 percent.

In considering the possibility that some of these farm operators will be forced to leave the farm and make the transition to nonfarm employment, the extent of their previous experience in full-time nonfarm work may be a meaningful indicator. As shown in Table 4, the experience of North Dakota farm operators in full-time nonfarm work is rather limited; 43 percent of all operators have never worked in a full-time nonfarm job. Among the more highly leveraged groups, the degree of off-farm work experience is greater, but more than 60 percent of the operators in the two most highly leveraged groups have three years or less of nonfarm work experience.

Somewhat similar patterns of association between off-farm employment and farm financial status were observed in Texas. Farm operators and

spouses with high debt-to-asset ratios were more likely to be seeking off-farm jobs in 1985, and spouses from highly leveraged farms were more frequently working off the farm in 1984.

IMPLICATIONS

A continuation of the current farm financial situation will likely require substantial adjustments by both farm operators and their families and by rural communities that are heavily dependent on agriculture. Farm operators have a variety of possible options for dealing with financial stress. Debt restructuring, asset restructuring, increasing income from off-farm work, and enhancing farm income through more efficient management are only some of the alternatives that may prove useful to some operators [2]. For many highly leveraged operators, however, such measures may not be sufficient to allow them to remain in farming. Liquidation of the farm operation and transition to nonfarm employment may be the only viable alternative for these producers.

Farm families that are forced to seek other employment are likely to experience adjustment problems similar to those encountered by workers displaced by manufacturing plant and mine closings [4]. While some of these operators and their spouses probably are already working off the farm, others may have little or no experience in off-farm employment. Further, displaced farm operators may be seeking alternative employment at a time when few new jobs are available in their local areas. Farm families may then be forced to relocate to larger urban areas in their own or other states in search of employment, perhaps only to find that their skills are not highly marketable in urban labor markets. For those farm families, grants, loans, and other programs to cover some of the costs of training, job search, and relocation could be very helpful.

The effect of farm failures on a rural community's private and public sectors will depend in part on (1) whether most farm liquidations represent a net decrease in the number of farms in the area and (2) whether most of the displaced farm families leave the community rather than remain in the local area. In rural areas close to larger urban places, the loss of population base associated with liquidations of commercial farms may be at least partially offset by increases in the number of small, part-time farms. In such areas, then, the current farm financial situation may contribute to an increasingly bimodal size distribution of farms; both large commercial farms and small part-time farms appear generally better equipped to survive than family-scale commercial farms [12]. In areas where commercial farming predominates and there are fewer off-farm job opportunities to support part-time farming, the primary effect of current financial conditions probably will be to accelerate farm consolidation.

Even though an area experiences a substantial decline in farm numbers, its population base could be maintained if other job opportunities could be developed. In fact, displaced farm families generally prefer to remain in the area if adequate job opportunities are available. For example, the North Dakota farm operators surveyed indicated that, if they quit farming, 38 percent would seek a job within the county where the farm was located and 70 percent would prefer to remain in the state. Similarly,

an Iowa study of farmers who quit for financial reasons indicated that 77 percent had remained in the same community, 10 percent were elsewhere in the state, and 13 percent had left the state [11]. Results of a Missouri study reveal a similar pattern [3].

Whether displaced farm families are able to remain in the community or are forced to relocate, however, will depend primarily on the availability of new jobs. In many agriculturally dependent areas, nonfarm job opportunities are likely to be stable or even declining as the impacts of reduced agricultural income are felt by the agribusiness sector and other local trade and service firms. In North Dakota, for example, taxable retail sales (measured in constant dollars) fell 20 percent from 1979 to 1984 while towns under 10,000 population experienced a 31 percent decrease. One reason for the relatively greater impact on the smaller towns is that agribusiness firms, such as farm machinery dealers (which make up a large portion of the retail trade for smaller towns), have been hard hit by low farm prices and incomes. In North Dakota about 80 percent of all farm machinery is sold in towns of 10,000 or fewer people; between 1980 and 1984 total farm machinery sales in the state were cut in half!

Unless alternative job opportunities can be developed, a substantial decline in farm numbers could have significant effects on such public services as primary and secondary schools. The fact that a high percentage of the most highly leveraged farmers are less than 45 years old and have above average numbers of school-age children suggests that the effects on schools could be disproportionately large. For all public services, local officials are likely to be confronted with the necessity of adjusting to the needs of a declining population. Such adjustments are often difficult in the short run, however, because physical facilities have fixed capacities. The need to continue to provide adequate services with a local revenue base that is likely to be static or even declining will lead to even greater needs for careful planning of facilities and service delivery systems. Expanded economic development programs to attract industry to rural areas could not only benefit displaced farmers but also provide support for the economies and service structures of rural communities.

In summary, the policy responses currently being proposed focus on measures to assist financially troubled farmers to remain in farming. Although such measures are obviously needed, they fail to address some key aspects of current farm problems. It is readily apparent that a substantial percentage of farmers simply will not continue to farm. Programs to ease the transition of farmers to alternative employment and to assist rural communities in coping with secondary impacts of agricultural restructuring also should be carefully considered.

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