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Off-Farm Income and Employment of North Dakota Farm Families

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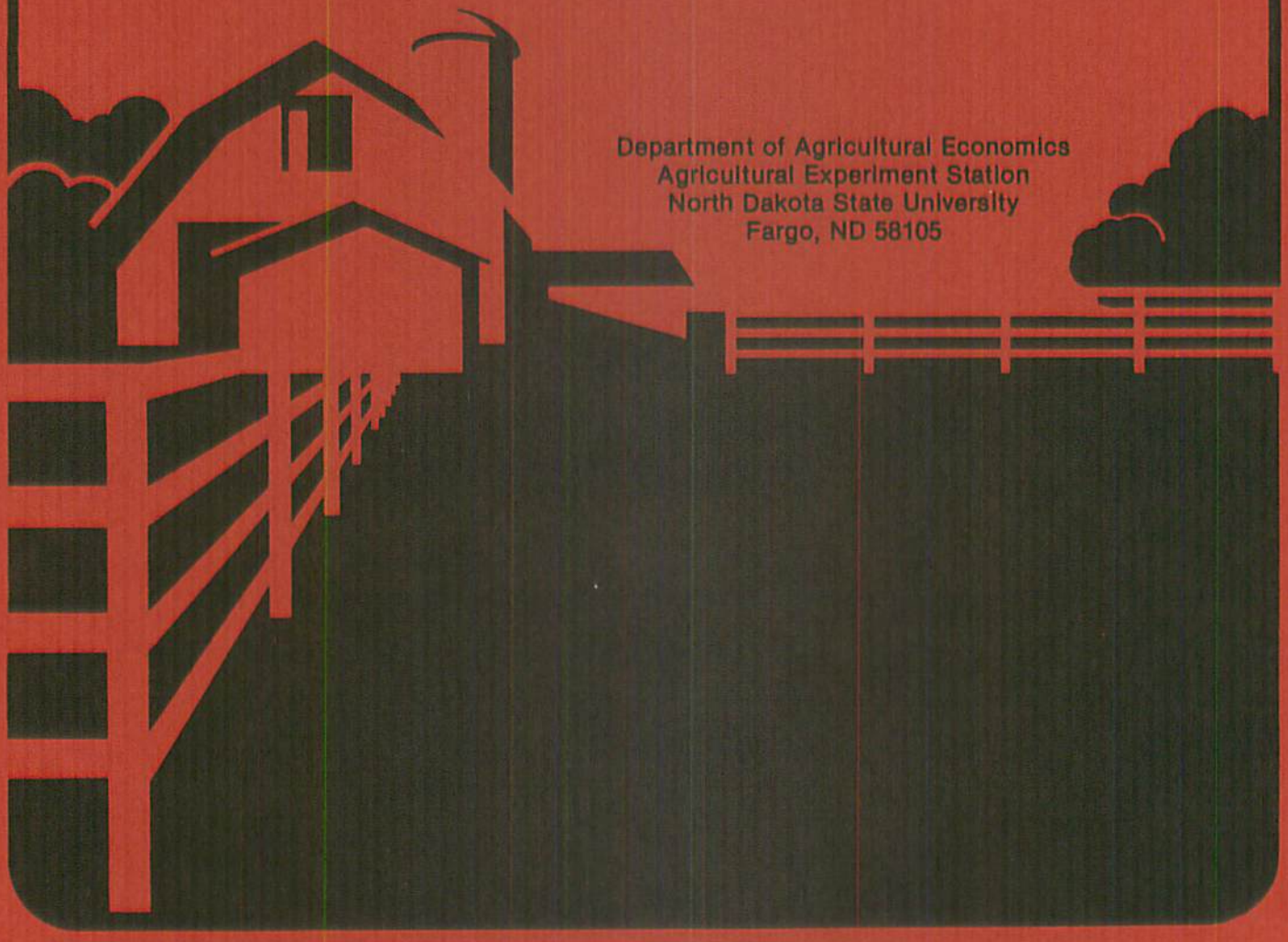

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Highlights

The purpose of this study was to examine the role and significance of off-farm income and employment for North Dakota farm and ranch families. Specific objectives were to estimate the magnitude and major sources of off-farm income for North Dakota farm and ranch families; evaluate the significance of off-farm income for different farm types and for different regions of the state; and determine the farm, household, and personal characteristics that are influential in determining whether farm operators and/or their spouses work off the farm.

Information concerning these characteristics was obtained from a random survey of 933 North Dakota farmers conducted in March and April 1985. In the survey, off-farm income was categorized into four types: earnings from off-farm employment, royalties or other payments associated with oil or other mineral leases, revenues from hunting or other wildlife leases, and other nonfarm income (such as interest on savings, income from investments, or income from other businesses). Following are highlights of the results.

- *Earnings from off-farm employment and other off-farm income were the types of off-farm income most frequently received. Earnings from off-farm employment were reported by about 41 percent of the farm families interviewed statewide and averaged $10,724. Other off-farm income was also reported by about 41 percent of survey respondents statewide and averaged $8,079. Oil and mineral lease revenues were reported by only 23 percent of respondents statewide, but they were major sources of off-farm income in the western regions. Hunting and wildlife leases were not a major source of off-farm income in any region.*

- *The average total family income was $23,513 statewide; these values ranged from $11,336 in Region 7 to $39,156 in Region 1. Net cash farm income accounted for 58 percent of total farm family income in 1984 in North Dakota, earnings from off-farm employment accounted for about 19 percent, other off-farm income for 14 percent, and oil and mineral leases for 9 percent.*

- *On the beef farms/ranches, net cash farm income accounted for only 24 percent of total family income. Oil revenues and earnings from off-farm work were the leading income sources for these farms. If mineral lease revenues were subtracted from the total farm family income of the beef producers, their average family income would be only $12,921, or 55 percent of the state average. Crop farms had a level of family income about 19 percent above the state average. The dairy and diversified farm categories experienced very low levels of family income in 1984.*

- *Total family income was highest for those households in which both operator and spouse were employed, and off-farm employment earnings accounted for nearly 58 percent of total income for these households. Farms where neither the operator or spouse was employed had total family income near the average for all survey respondents.*

- *To assess the significance of off-farm income in enabling operators to meet their financial obligations, four simulations were performed. Each simulation consisted of subtracting one or more of the following items from total family income: family living expenses, principal payments, off-farm employment earnings, and mineral lease income. When principal payments and family living expenses were subtracted (Simulation 2), more than half of the operators surveyed had income levels insufficient to cover operating costs, family living expenses, and principal payments. 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. The other simulations indicated similar difficulties in meeting financial obligations without off-farm income.*

- *Of the farm operators surveyed, 24 percent reported that they had worked at an off-farm job in 1984, and 31 percent had spouses who worked off the farm. In order to evaluate the relative significance of various individual, family, farm, area, and financial characteristics in determining farm operators' and spouses' decisions to work off the farm, multiple discriminant analyses were conducted. Operators and spouses who worked off the farm shared a number of characteristics. They were younger than their counterparts who did not work off the farm and had somewhat higher levels of education. Their farms were smaller than average with lower levels of net cash farm income and higher debt-to-asset ratios. If one member of the couple was employed off the farm, this increased the probability that the other would be employed also. Operators and spouses who indicated their intention to look for off-farm work in 1985 tended to be younger than average and to be operating farms with lower than average net cash farm income and higher debt-to-asset ratios.*

- *Farm operators who reported off-farm employment in 1984 worked an average of 108 days. Spouses who were employed worked an average of 166 days. Regression analysis was used to estimate two models to explain differences in the extent of off-farm work. The debt-to-asset ratio was found to be significant in one of the models, and was positively related to the number of days worked. For spouses, acres operated and gross farm income entered both models with a negative effect on days worked while the beef farm type and years worked at the job had positive effects in both models. Variables reflecting the number of children of different age classes entered both models, but with different signs.*

This report reveals the growing importance of off-farm employment and income to the financial stability of North Dakota farm families. The role of rural development in promoting job growth may be crucial to the survival of some small- and medium-sized farm operations.

OFF-FARM INCOME AND EMPLOYMENT OF NORTH DAKOTA FARM FAMILIES

F. Larry Leistritz, Harvey G. Vreugdenhil, Brenda L. Ekstrom, and Arlen G. Leholm*

The proportion of the total income of farm families which comes from off-farm sources has increased substantially in recent years (Findeis 1985). On a nationwide basis, off-farm income (including wages and salaries, nonfarm business income, interest and dividends, rent from nonfarm real estate, and social security or pension payments) now accounts for about 60 percent of the total income of farm families (Ahearn, Johnson, and Strickland 1985; Reimund and Somwaru 1985).

Although income from off-farm sources constitutes a large and growing component of total farm family income from a national perspective, revenue from these sources is not uniformly distributed. Rather, some farm types and geographic regions receive larger than average amounts of off-farm income.

Typically, both small farms (sales less than $40,000) and very large farms (sales greater than $250,000) have higher levels of off-farm income than family-sized commercial farms. This relationship is illustrated by the results of a recent national survey (Johnson, Baum, and Prescott 1985):

Gross Sales Per Farm	Off-Farm Income Per Farm
More than $250,000	$12,057
$100,000 to $250,000	10,409
$40,000 to $99,999	9,298
Less than $40,000	19,335

A probable explanation for this relationship is that families operating small farms have more time available for off-farm employment, whereas operators of very large farms receive significant returns from savings and off-farm investments.

When off-farm income is examined on a regional basis, substantial differences are again noted. Figure 1 illustrates average off-farm income by farm production regions of the United States. The regional differences in 1984 were substantial; average off-farm income per farm ranged from a

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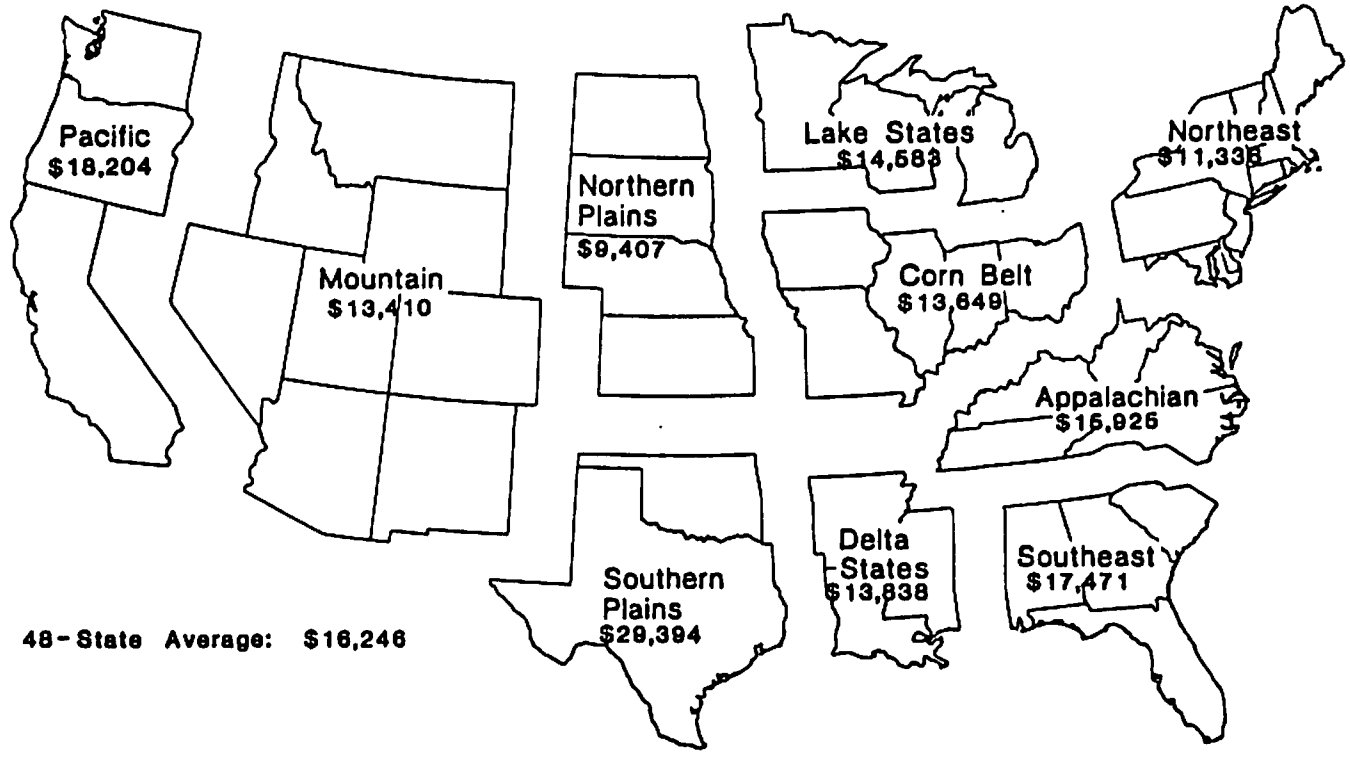

Figure 1. Off-Farm Income of Farm Families, 1984, by Farm Production Region (Average per Farm)

SOURCE: Johnson, Baum, and Prescott 1985

low of $9,407 in the Northern Plains to a high of $29,394 in the Southern Plains. It appears that regional differences in farm size and type and in availability of off-farm employment affect off-farm income levels.

North Dakota farm and ranch operators are facing their most severe financial crisis since the 1930s (Leholm et al. 1985; Pederson, Watt, and Vreugdenhil 1985). Income from off-farm sources may be critical to some farm families as they endeavor to meet cash flow needs, and some farm operators and their spouses may be seeking off-farm employment in order to supplement inadequate farm income. Because of the disparities in off-farm income by farm size and region, however, national statistics appear to be of limited value in assessing the significance of off-farm income and employment for North Dakota farm families. North Dakota agriculture is dominated by commercial farms (defined as farms with total sales exceeding $40,000 per year). Such farms account for 78.9 percent of all North Dakota farms compared to less than 40 percent of all farms nationwide. In addition, only 20 percent of North Dakota farm operators worked more than 100 days off the farm in 1982 compared to 43 percent nationally (U.S. Bureau of the Census 1984); this may indicate that off-farm employment opportunities are much more limited in North Dakota than in most other states. Therefore, information specific to North Dakota farm and ranch operations is needed.

The purpose of this study is to examine the role and significance of off-farm income and employment for North Dakota farm and ranch families. Specific objectives are to:

1. estimate the magnitude and major sources of off-farm income for North Dakota farm and ranch families,

2. evaluate the significance of off-farm income for different farm types and for different regions of the state, and

3. determine the farm, household, and personal characteristics that are influential in determining whether farm operators and/or their spouses work off the farm.

The report first briefly explains the study procedures, then sources of off-farm income are examined. Next, off-farm employment of farm operators and their spouses is examined in terms of the following characteristics: off-farm employment status in 1984, days worked off the farm, and (for those not employed off the farm in 1984) future plans to seek off-farm work. Finally, conclusions and implications of these analyses are presented.

Study Procedures

Information concerning these characteristics was obtained from a survey conducted in March and April 1985. A random sample of farm operators was selected, and telephone interviews were conducted. Initial screening questions in these interviews were used to ensure that all respondents (1) were less than 65 years old, (2) considered farming to be

their primary occupation, and (3) sold at least $2,500 of farm products in 1984. Of 1,206 farm operators contacted who met these criteria, 933 completed the survey, for a response rate of 77 percent.

Selected characteristics of survey respondents were compared with North Dakota data from the 1982 Census of Agriculture to determine representativeness. These comparisons indicated that the sample is representative of those North Dakota farms whose operators consider farming to be their principal occupation (Leholm et al. 1985).

Off-Farm Income of North Dakota Farm Families

In the survey, off-farm income was categorized into four types: earnings from off-farm employment, royalties or other payments associated with oil or other mineral leases, revenues from hunting or other wildlife leases, and other nonfarm income (such as interest on savings, income from investments, or income from other businesses). These types of off-farm income are analyzed in this section by first examining the proportion of farm families in each region of the state who receive income of each type. Next, the contribution of each type of off-farm income to total farm family income is examined for different farm types and for various regions of the state. Finally, the importance of off-farm income in enabling farm families to meet financial obligations is assessed.

Types of Off-Farm Income

The percentages of farm families that received each type of off-farm income in 1984 are shown in Table 1, along with the average amount received. Earnings from off-farm employment and other off-farm income (interest, dividends, etc.) were the types of off-farm income most frequently received. Earnings from off-farm employment were reported by about 41 percent of the farm families interviewed statewide. This percentage varied among regions from a low of 32 percent in Region 7 to a high of 50 percent in Region 8. (For a map of State Planning Regions, see Figure 2.) The average amount received was $10,724 statewide and ranged from $8,995 in Region 6 to $13,430 in Region 8. Other off-farm income was also reported by about 41 percent of survey respondents statewide, with the percentage varying by region from a low of 29 percent in Region 7 to a high of 49 percent in Region 5. Other off-farm income averaged $8,079 statewide and exhibited substantial variability among regions. Oil and mineral (including coal) lease revenues were reported by only 23 percent of respondents statewide, but they were the type of off-farm income reported most frequently in Regions 1 and 7 and second most frequently in Regions 2 and 8. (These four regions are the scene of most petroleum and coal development in the state.) Revenues from oil and mineral leases were a substantial source of off-farm income, particularly in Regions 1 and 8 where average payments exceeded $20,000. In the other regions, less than 10 percent of the farmers reported revenues from mineral leases. Hunting and wildlife leases were not a major source of off-farm income in any region.

TABLE 1. PERCENTAGE OF FARM OPERATORS REPORTING VARIOUS TYPES OF OFF-FARM INCOME, AND AVERAGE AMOUNT RECEIVED BY REGION AND STATE, 1984

Income Source	State	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8
Earnings from off-farm employment:									
Percentage reporting	40.7%	37.0%	43.3%	46.1%	44.0%	39.8%	38.9%	31.8%	50.0%
Average amount received[a]	$10,724.10	$10,764.70	$10,987.80	$11,749.10	$11,884.20	$9,247.10	$8,995.40	$9,657.30	$13,430.60
Oil and mineral leases:									
Percentage reporting	23.2%	60.9%	40.4%	9.8%	0.0%	4.1%	7.8%	34.1%	47.9%
Average amount received[a]	$ 9,238.10	$24,538.10	$ 4,596.50	$ 651.0	---	$3,023.20	$1,177.50	$ 604.60	$21,195.00
Hunting/wildlife leases:									
Percentage reporting	1.0%	0.0%	0.7%	2.9%	1.1%	0.0%	1.8%	0.6%	0.0%
Average amount received[a]	$ 2,242.20	---	$ 320.00	$ 1,650.00	$ 8,000.00	---	$2,300.00	$ 10.00	---
Other off-farm income									
Percentage reporting	40.7%	41.3%	35.5%	43.1%	48.4%	48.8%	41.3%	29.3%	46.9%
Average amount received[a]	$ 8,078.70	$14,139.80	$10,966.80	$16,323.80	$ 8,122.10	$5,489.90	$4,652.20	$2,195.80	$ 9,186.40

[a]Average amount received is the average for those who received that type of income.

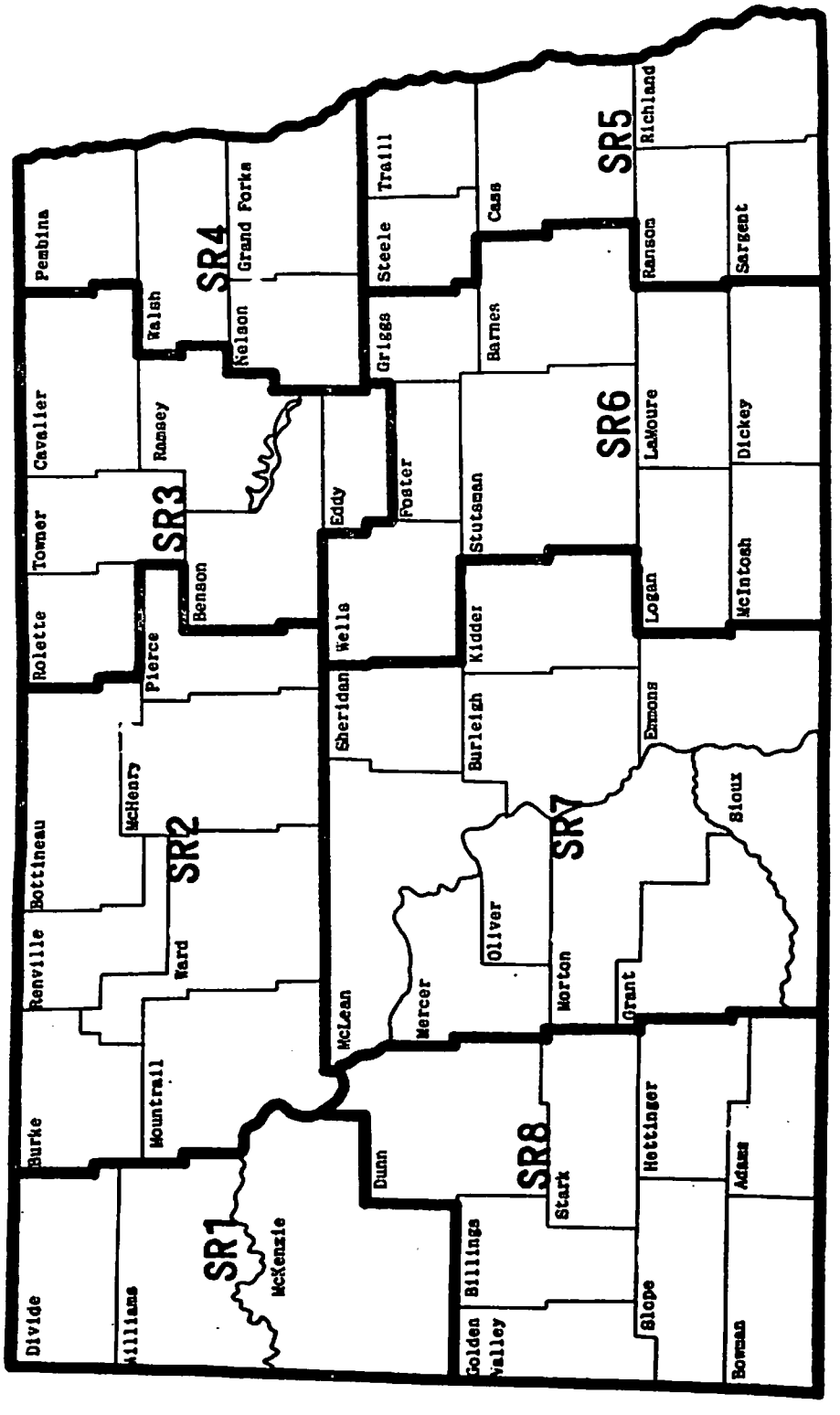

Figure 2. North Dakota State Planning Regions

Some caution must be exercised in interpreting the average receipts shown in Table 1. A few very large payments may distort the averages, particularly in the case of oil leases and other off-farm income. The distributions of the amounts received from several off-farm income sources are shown in Table 2. Of the farmers who received oil lease payments,

TABLE 2. DISTRIBUTION OF OFF-FARM INCOME REPORTED BY NORTH DAKOTA FARM OPERATORS, 1984

Category	Type of Off-Farm Income			
	Earnings From Off-Farm Employment	Oil and Mineral Leases	Other Off-Farm Income	Total Off-Farm Income
	-----percentage who reported each type of income----			
Less than $1,000	7.1	59.3	34.0	18.0
$1,000 to $4,999	28.2	19.4	37.6	27.3
$5,000 to $9,999	21.6	6.5	11.81	17.9
$10,000 to $39,999	41.5	10.6	12.61	31.5
$40,000 to $99,999	1.3	2.8	2.9	4.1
$100,000 or greater	0.3	1.4	1.0	1.2

only 4 percent (nine individuals) received payments exceeding $40,000 and 59 percent were paid less than $1,000. Overall, 79 percent obtained less than $5,000. Similarly, 72 percent of those who received other off-farm income obtained less than $5,000, but 4 percent received more than $40,000.

Off-Farm Income by Region and Type of Farm

Net cash farm income accounted for 58 percent of total farm family income[1] in 1984 in North Dakota (Table 3), earnings from off-farm employment

[1]In this discussion, total farm family income refers to net cash farm income plus all other off-farm income. Other phrases used synonymously in this report are total family income and family income. Net cash farm income is gross cash farm income less gross cash farm expenses and depreciation. If depreciation exceeds new spending for depreciable assets, then net cash farm income and hence total farm family income will somewhat understate the actual funds available to meet family living expenses, principal payments, taxes, and other cash flow needs.

TABLE 3. COMPOSITION OF FARM FAMILY INCOME BY REGION OF NORTH DAKOTA, 1984

	State	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8
Net cash farm income:									
Average[a]	$13,668	$14,401	$11,335	$10,244	$19,238	$24,320	$15,417	$ 7,421	$ 9,284
Percentage of total	58.1	36.8	51.9	44.6	67.6	78.9	73.4	65.5	30.4
Earnings from off-farm employment:									
Average[a]	$ 4,368	$ 3,978	$ 4,754	$ 5,414	$ 5,224	$ 3,684	$ 3,501	$ 3,065	$ 6,715
Percentage of total	18.6	10.2	21.8	23.6	18.3	12.0	16.7	27.0	22.0
Oil and mineral leases:									
Average[a]	$ 2,139	$14,936	$ 1,858	$ 64	$ 0	$ 123	$ 92	$ 206	$10,156
Percentage of total	9.1	38.1	8.5	0.3	0	0.4	0.4	1.8	33.2
Hunting/wildlife leases:									
Average[a]	$ 22	$ 0	$ 2	$ 49	$ 88	$ 0	$ 41	$ 0	$ 0
Percentage of total	0.1	0	0	0.2	0.3	0	0.2	0	0
Other off-farm income:									
Average[a]	$ 3,316	$ 5,840	$ 3,889	$ 7,202	$ 3,927	$ 2,678	$ 1,950	$ 644	$ 4,402
Percentage of total	14.1	14.9	17.8	31.3	13.8	8.7	9.3	5.7	14.4
Total farm family income:									
Average[a]	$23,513	$39,156	$21,838	$22,973	$28,477	$30,805	$21,001	$11,336	$30,557
Total percentage	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[a]Average for all farm families responding to the survey, including those who had no income in a particular category.

accounted for about 19 percent, other off-farm income for 14 percent, and oil and mineral leases for 9 percent. The average family income of $23,513 statewide compares to a national estimate of $26,633 developed from the 1984 Farm Costs and Returns Survey (FCRS) conducted by the U.S. Department of Agriculture (Ahearn, Johnson, and Strickland 1985).

The importance of the various components of farm family income differed substantially among regions. In oil-rich Regions 1 and 8, oil and mineral lease revenues actually exceeded net cash farm income. The reader is again cautioned concerning the effects of a few very large lease payments on these regional averages; averages for the operators in these regions were not representative of the situation for a typical operator. Net cash farm income accounted for 45 percent of family income in Region 3, just over half of family income in Region 2, about two-thirds in Regions 4 and 7, and about three-fourths in Regions 5 and 6. The regional variation in total farm family income was also substantial. These values ranged from $11,336 in Region 7 to $39,156 in Region 1.

As noted earlier, the level and type of off-farm income were expected to vary by farm size, with smaller farms reflecting greater earnings from off-farm employment. This relationship held true for North Dakota (Table 4); families with farm sales of less than $40,000 had off-farm employment earnings nearly twice those of farm families with sales exceeding $250,000. On the other hand, other off-farm income was positively associated with volume of farm sales.

The composition of farm family income by type of farm is examined in Table 5. Farm type was defined according to the source of the majority of total sales. For example, farms with more than 50 percent of their total sales coming from beef cattle were classified beef. All farms not falling into the beef, crop, or dairy classes were categorized as diversified. The information from Table 5 reflects great differences in both total family income and the sources of income among the different farm types. On the beef farms/ranches, net cash farm income accounted for only 24 percent of total family income. Oil revenues and earnings from off-farm work were the leading income sources for these farms, which had a level of total family income that was about 9 percent below the state average. Most beef operations were located in the oil- and coal-producing areas of the state. If mineral lease revenues were subtracted from the total farm family income of the beef producers, their average family income would be only $12,921, or 55 percent of the state average. Crop farms had a level of family income about 19 percent above the state average. This resulted from a net cash farm income that was substantially higher than average, coupled with above-average levels of off-farm earnings and other off-farm income. The dairy and diversified farm categories, on the other hand, experienced very low levels of family income in 1984. For each of these two farm types, total family income was less than 40 percent of the average for all farmers surveyed. Low levels of net cash farm income together with low levels of off-farm earnings and other off-farm income were responsible for this result.

The relationship between family income composition and the employment status of the farm operator and spouse is displayed in Table 6.

TABLE 4. COMPOSITION OF FARM FAMILY INCOME BY GROSS FARM INCOME CATEGORY OF NORTH DAKOTA FARMS, 1984

Income Source	Gross Farm Income				
	Less Than $40,000	$40,000 to $99,999	$100,000 to $249,999	$250,000 and Over	State
Net cash farm income:					
Average	$ 4,787	$10,326	$18,458	$46,400	$13,668
Percentage of total	38.0	48.1	66.3	73.8	58.1
Earnings from off-farm employment:					
Average	$ 5,231	$ 4,513	$ 4,484	$ 2,968	$ 4,368
Percentage of total	41.5	21.0	16.1	4.7	18.6
Oil and mineral leases:					
Average	$ 1,166	$ 3,838	$ 1,252	$ 1,066	$ 2,139
Percentage of total	9.3	17.9	4.5	1.7	9.1
Hunting and wildlife leases:					
Average	$ 0.00	$ 23	$ 13	$ 134	$ 22
Percentage of total	0.0	0.1	0.1	0.2	0.1
Other off-farm income:					
Average	$ 1,419	$ 2,787	$ 3,618	$12,328	$ 3,316
Percentage of total	11.3	13.0	13.0	19.6	14.1
Total farm family income:					
Average	$12,602	$21,487	$27,824	$62,897	$23,513
Total percentage	100.0	100.0	100.0	100.0	100.0

TABLE 5. COMPOSITION OF FARM FAMILY INCOME BY TYPE OF FARM, 1984

Income Source	Beef	Crop	Dairy	Diversified	State
Net cash farm income:					
Average	$ 5,219	$17,795	$5,563	$4,001	$13,668
Percentage of total	24.3	63.5	67.6	50.1	58.1
Earnings from off-farm employment:					
Average	$ 5,520	$ 4,773	$1,934	$2,024	$ 4,368
Percentage of total	25.7	17.0	23.5	25.3	18.6
Oil and mineral leases:					
Average	$ 8,589	$ 1,236	$ 235	$ 960	$ 2,139
Percentage of total	39.9	4.4	2.9	12.0	9.1
Hunting and wildlife leases:					
Average	$ 0	$ 23	$ 0	$ 48	$ 22
Percentage of total	0.0	0.1	0.0	0.6	0.1
Other off-farm income:					
Average	$ 2,183	$ 4,207	$ 498	$ 957	$ 3,316
Percentage of total	10.1	15.0	6.0	12.0	14.1
Total farm family income:					
Average	$21,510	$28,033	$8,231	$7,990	$23,513
Total percentage	100.0	100.0	100.0	100.0	100.0

TABLE 6. COMPOSITION OF FARM FAMILY INCOME BY OFF-FARM EMPLOYMENT STATUS OF OPERATOR AND SPOUSE, NORTH DAKOTA, 1984

Income Source	Both Employed	Operator Only Employed	Spouse Only Employed	Neither Employed	State
Net cash farm income:					
Average	$10,346	$10,405	$10,038	$16,249	$13,668
Percentage of total	35.9	38.9	52.0	70.1	58.1
Earnings from off-farm employment:					
Average	$16,619	$ 8,935	$ 7,111	$ 216	$ 4,368
Percentage of total	57.7	33.4	36.8	0.9	18.6
Oil and mineral leases:					
Average	$ 995	$ 2,069	$ 264	$ 2,973	$ 2,139
Percentage of total	3.5	7.7	1.4	12.8	9.1
Hunting and wildlife leases:					
Average	$ 27	$ 15	$ 0.0	$ 29	$ 22
Percentage of total	0.1	0.1	0.0	0.1	0.1
Other off-farm income:					
Average	$ 807	$ 5,318	$ 1,904	$ 3,720	$ 3,316
Percentage of total	2.8	19.9	9.8	16.1	14.1
Total farm family income:					
Average	$28,794	$26,742	$19,317	$23,187	$23,513
Total percentage	100.0	100.0	100.0	100.0	100.0

Total family income was highest for those households in which both operator and spouse were employed, and off-farm employment earnings accounted for nearly 58 percent of total income for these households. Off-farm employment earnings and total family income dropped when only the operator or the spouse was employed. For those farms where only the operator was employed off the farm, however, much of the decrease in earnings was offset by an increase in other off-farm income. Farms where neither the operator nor spouse was employed off the farm had total family income near the average for all survey respondents. These farms had a relatively high level of net cash farm income, probably reflecting a tendency for families with small- to medium-sized farms to work off the farm while those with larger farms did not.

Importance of Off-Farm Income

To assess the significance of off-farm income in enabling farm and ranch operators to meet their financial obligations as well as to evaluate cash flow problems of North Dakota farm operators generally, several simulations were performed. First, 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 (Leholm 1984). 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.[2]

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.

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[2]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, because 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.

To evaluate the significance of off-farm income in enabling farm and ranch operators to meet cash flow needs, two additional simulations were conducted. The first of these subtracts family living expenses, off-farm employment earnings, and mineral lease income from total farm family income. This simulation evaluates the ability of farm families to meet immediate cash demands without the two off-farm income sources of employment earnings and mineral leases.[3] The final simulation was identical to simulation three except that principal payments also were subtracted from farm family income. This simulation tests the ability of farm families to meet both current expenses and debt repayment demands in the absence of off-farm employment earnings and mineral lease income.

The results of these four simulations are summarized by debt-to-asset ratio categories in Table 7. 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 ratio 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 7). 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.

The role of off-farm employment earnings and mineral lease revenues in enabling farm and ranch operators to meet debt service and other obligations is also shown in Table 7. Comparison of the results of the first and third simulations indicates that only 48 percent of the farm operators surveyed would be able to cover operating costs and family living expenses without these sources of off-farm income, compared to 59 percent when off-farm income is included. Thus, for about 11 percent of the operators surveyed, off-farm employment earnings and mineral lease revenues are pivotal in allowing them to meet their expenses. The distribution of cash flow problems by region, farm type, gross farm income categories, and off-farm employment status is shown in Table 8 and in Appendix Tables 1 through 4. As indicated in Table 8, the percentages of operators whose total family income is insufficient to cover operating expenses and family living costs are highest in Region 7, for dairy farmers, and for farmers with gross farm incomes of less than $40,000.

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[3] Other off-farm income was not subtracted in this simulation. The reasoning was that much of this income consisted of interest on savings which in many cases were the result of previous periods of favorable farm income.

TABLE 7. TOTAL FARM FAMILY INCOME LESS FAMILY LIVING EXPENSES, PRINCIPAL PAYMENTS, OFF-FARM EARNINGS, AND MINERAL LEASE INCOME, BY DEBT-TO-ASSET RATIO FOR NORTH DAKOTA FARMERS

Category	Units	Debt-to-Asset Ratio: No Debt	1% to 40% Debt	41% to 70% Debt	Over 70% Debt	Total
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
Simulation 3						
Total farm family income less family living expense, off-farm earnings, and mineral lease income:						
Average	Dollars	19,050	7,167	-5,451	-11,105	3,328
Distribution:						
Less than -$4,999	Percent	17.0	37.1	54.2	66.4	42.0
-$4,999 to 0	Percent	9.5	9.5	11.7	9.4	10.0
0 to $4,999	Percent	12.9	14.6	10.2	9.4	12.5
$5,000 to $19,999	Percent	25.9	17.9	16.6	11.7	18.0
$20,000 and over	Percent	34.7	21.0	7.3	3.1	17.5
Simulation 4						
Total farm family income less family living expense, off-farm earnings, mineral lease income, and principal payments:						
Average	Dollars	19,050	-1,167	-25,662	-37,342	-8,850
Distribution:						
Less than -$4,999	Percent	17.0	47.9	82.9	92.2	57.4
-$4,999 to 0	Percent	9.5	12.2	7.3	0.8	8.9
0 to $4,999	Percent	12.9	12.2	4.9	3.9	9.4
$5,000 to $19,999	Percent	25.9	13.2	2.4	1.6	11.1
$20,000 and over	Percent	34.7	14.7	2.4	1.6	13.3

TABLE 8. TOTAL FARM FAMILY INCOME LESS FAMILY LIVING EXPENSES BY REGION, TYPE OF FARM, AND GROSS INCOME CATEGORY OF NORTH DAKOTA FARMS, 1984

Category	Average	Discribution				
		Less Than -$4,999	-$4,999 to 0	0 to $4,999	$5,000 to $19,999	$20,000 and Over
		percent				
State regions:						
Region 1	$27,960	31.0	9.5	7.1	9.5	42.9
Region 2	9,013	26.0	16.8	16.0	23.7	17.6
Region 3	10,022	25.7	12.9	11.9	25.7	23.8
Region 4	13,457	23.0	6.9	17.2	24.1	28.7
Region 5	15,551	16.8	9.2	15.1	26.9	31.9
Region 6	7,889	31.4	9.4	12.0	22.6	24.5
Region 7	-1,893	44.3	14.6	14.6	17.1	9.5
Region 8	18,434	30.8	9.9	13.2	19.8	26.4
Type of farm:[a]						
Crop	13,538	23.0	10.5	13.8	25.1	27.7
Beef	10,230	41.2	12.6	12.6	13.5	20.2
Dairy	-5,149	45.1	19.6	13.7	19.6	2.0
Diversified	-3,401	47.9	13.5	15.6	13.5	9.4
Gross farm income:						
Less than $40,000	1,160	31.8	19.0	22.9	17.9	8.4
$40,000 to $99,999	8,619	27.4	12.3	16.6	26.9	16.9
$100,000 to $249,999	11,502	29.0	8.3	6.9	21.4	34.4
$250,000 and over	41,605	22.7	4.6	4.6	13.6	54.6

[a]A farm was classified as beef, crop, or dairy if more than 50 percent of gross farm income came from that source. Farms not receiving 50 percent or more of gross farm income from one of these sources were classified as diversified.

Off-Farm Employment of North Dakota Farm Families

As noted earlier, earnings from off-farm employment are the largest single source of nonfarm income for North Dakota farm and ranch operators. Further, during periods of economic stress, off-farm work may be one of the few means by which farm families can increase their resources to cope with cash flow problems. This section examines the characteristics of North Dakota farm operators and spouses who were employed off the farm in 1984 and explores the factors associated with (1) the decision to work off the farm and (2) the number of days worked off the farm. In addition, the characteristics of farm operators and spouses who were not employed in 1984 but who indicated an intention to seek off-farm work in 1985 are examined.

Decision to Work Off the Farm

The percentage of North Dakota farm operators who work at off-farm jobs has increased in recent years. Statewide, 20 percent of North Dakota farmers and ranchers worked 100 or more days off their farm in 1982, up from 13 percent in 1974 (Table 9). These percentages are less than half those reported for the nation. Another contrast between North Dakota and national patterns is that 84 percent of North Dakota farm operators in 1982 considered farming to be their principal occupation, compared to only 56 percent nationally. These percentages probably reflect both the predominance of commercial-scale farms and the relative scarcity of off-farm job opportunities in North Dakota.

Farm Operators. Of the farm operators surveyed, 24 percent reported that they had worked at an off-farm job in 1984 (Table 10). Substantial variation in rates of off-farm employment can be noted among regions, with higher than average values noted for Regions 2 and 8 and relatively low values for Regions 6 and 7. Of the farm operators who were not employed in 1984, 9.6 percent indicated that they planned to look for off-farm work in 1985. Thus, more than 31 percent of the operators surveyed were either employed off the farm or looking for off-farm work (Table 10).

A profile of North Dakota farm operators who were employed off the farm in 1984 is provided in Table 11. It can be noted that operators who worked off the farm were younger and had somewhat higher levels of education than those who did not. They operated farms that were significantly smaller (in terms of both acreage and gross income) and if married, their spouses were more likely to be employed off the farm also. These farmers also tended to have lower levels of net cash farm income and higher levels of debt-to-asset ratio.

In view of the financial pressures currently facing many farm operators, it is of special interest to examine the relationships between off-farm employment and selected financial indicators. The relationship between off-farm employment and the farmer's debt-to-asset ratio was examined by Leholm et al. (1985). They found that farmers with high debt-to-asset ratios were more likely to seek off-farm work than their less

TABLE 9. PRINCIPAL OCCUPATION OF FARM OPERATORS AND EXTENT OF OFF-FARM EMPLOYMENT, STATE PLANNING REGIONS, NORTH DAKOTA, AND UNITED STATES, 1982 AND 1974

Area	Year	Percentage of Operators Whose Principal Occupation is Farming	Percentage of Operators Who Worked Off Their Farm	
			200 Days or More	100 Days or More
Region 1	1982	80.1	16.5	25.1
	1974	85.6	12.0	17.3
Region 2	1982	79.8	16.7	24.4
	1974	88.8	9.2	14.9
Region 3	1982	86.7	10.8	18.7
	1974	91.0	7.6	13.5
Region 4	1982	87.5	10.9	18.3
	1974	92.0	7.6	14.1
Region 5	1982	86.8	11.4	17.4
	1974	90.7	7.4	12.5
Region 6	1982	87.7	9.8	14.9
	1974	91.6	7.4	11.1
Region 7	1982	80.5	15.7	21.9
	1974	87.9	9.7	13.9
Region 8	1982	82.1	13.8	20.9
	1974	89.9	8.1	12.8
North Dakota	1982	84.0	13.2	20.0
	1974	89.4	8.5	13.4
United States	1982	56.2	34.6	43.0
	1974	62.6	28.9	35.7

SOURCE: U.S. Bureau of the Census, 1977 and 1984.

TABLE 10. OFF-FARM EMPLOYMENT IN 1984 BY REGION OF NORTH DAKOTA FARMERS

Employment Status	Region 1		Region 2		Region 3		Region 4		Region 5		Region 6		Region 7		Region 8		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Were you employed in an off-farm job in 1984?																		
Yes	12	26.1	45	31.9	23	22.5	23	25.3	30	24.4	30	18.0	29	17.4	32	33.3	224	24.0
No	34	73.9	96	68.1	79	67.5	68	74.7	93	75.6	137	82.0	138	82.6	64	66.7	709	76.0
Total	46	100.0	141	100.0	102	100.0	91	100.0	123	100.0	167	100.0	167	100.0	96	100.0	933	100.0
Are you planning to look for an off-farm job in 1985?																		
Yes	4	11.8	12	11.8	7	8.6	5	7.3	10	10.2	7	5.0	24	14.0	5	7.5	70	9.6
No	30	82.2	90	88.2	74	91.4	63	92.7	88	89.8	132	95.0	123	86.0	62	92.5	662	90.4
Total	34	100.0	102	100.0	81	100.0	68	100.0	98	100.0	139	100.0	143	100.0	67	100.0	732	100.0
Percentage who are either employed off the farm or are planning to look for off-farm job in 1985:		34.8		40.4		29.4		30.8		32.5		22.2		31.7		38.5		31.5

TABLE 11. SELECTED CHARACTERISTICS OF NORTH DAKOTA FARM OPERATORS EMPLOYED OFF THE FARM AND THOSE NOT EMPLOYED OFF THE FARM IN 1984

Item	Units	Employed Off the Farm	Not Employed Off the Farm
Operator's age:			
Average age	Years	40.9	46.4
Distribution:			
Less than 25	Percent	3.6	2.8
25 to 34	Percent	32.1	16.8
35 to 44	Percent	25.5	22.7
45 to 54	Percent	24.5	26.0
55 to 64	Percent	14.3	31.7
Marital status:			
Married	Percent	87.1	85.3
Single, widowed, divorced, etc.	Percent	12.9	14.7
Employment status of spouse:			
Spouse employed off the farm	Percent	41.1	24.8
Spouse not employed off the farm	Percent	58.9	75.2
Education of operator:			
Eighth grade or less	Percent	9.7	18.1
Some high school	Percent	6.5	9.9
Completed high school	Percent	36.4	36.0
Attended college or other post-secondary school	Percent	30.4	25.3
Completed college	Percent	17.1	10.7
Farm Type:[a]			
Beef	Percent	17.0	12.4
Crop	Percent	70.5	67.6
Dairy	Percent	2.7	6.4
Diversified	Percent	9.8	13.7
Acres operated:			
Average	Acres	1,281.2	1,730.5
Distribution:			
Less than 500	Percent	15.2	7.8
500 to 999	Percent	29.0	24.7
1,000 to 1,499	Percent	26.3	24.2
1,500 to 1,999	Percent	13.4	15.1
2,000 and over	Percent	16.1	28.3

- Continued -

TABLE 11. SELECTED CHARACTERISTICS OF NORTH DAKOTA FARM OPERATORS EMPLOYED OFF THE FARM AND THOSE NOT EMPLOYED OFF THE FARM IN 1984 (CONTINUED)

Item	Units	Employed Off the Farm	Not Employed Off the Farm
Gross farm income:			
Average	Dollars	83,118.4	112,402.8
Distribution:			
Less than $40,000	Percent	30.5	18.2
$40,000 to $99,999	Percent	39.9	40.1
$100,000 to $249,999	Percent	26.8	33.1
$250,000 and over	Percent	2.8	8.6
Net Cash Farm Income:			
Average	Dollars	11,233.1	16,066.8
Distribution:			
Negative	Percent	26.4	23.2
0 to $9,999	Percent	27.4	19.3
$10,000 to $19,999	Percent	23.1	36.7
$20,000 and over	Percent	23.1	20.8
Debt-to-asset ratio:			
Average	Percent	43.4	32.9
Distribution:			
.00 to .40	Percent	51.9	65.1
.41 to .70	Percent	26.4	22.5
Greater than .70	Percent	21.6	12.4
County population:			
Less than 5,000	Percent	28.6	28.8
5,000 to 9,999	Percent	37.5	31.9
10,000 to 24,999	Percent	20.5	24.8
25,000 and over	Percent	13.4	14.5
County type:[b]			
SMSA	Percent	9.8	11.3
Urban	Percent	10.3	8.2
Adjacent	Percent	57.1	58.1
Remote	Percent	22.8	22.4

[a]A farm was classified as beef, crop, or dairy if more than 50 percent of gross farm income came from that source. Farms not receiving 50 percent or more of gross farm income from one of these sources were classified as diversified.

[b]SMSA = Counties designated as Standard Metropolitan Statistical Areas (SMSAs).
Urban = Counties with a city with a population of 10,000 or more but which are not SMSAs.
Adjacent = Counties that border one or more SMSA or urban counties.
Remote = Counties which fall into none of the first three categories.

highly leveraged counterparts. This relationship can be summarized as follows:

Debt-to-Asset Ratio	Percentage of Operators Who Worked Off the Farm in 1984
No debt	15.7
1% to 40% debt	22.3
41% to 70% debt	27.9
Over 70% debt	36.2

The relationship between off-farm employment of farm operators and their level of net cash farm income is shown in Table 12. There is an

TABLE 12. OFF-FARM EMPLOYMENT STATUS IN 1984 BY NET CASH FARM INCOME CATEGORIES OF NORTH DAKOTA FARMERS

Employment Status	Net Cash Farm Income									
	Negative		$0 to $4,999		$5,000-$9,999		$10,000-$19,999		$20,000 & Over	
	No.	%	No.	%	No.	%	No.	%	No.	%
Employed off the farm	55	26.3	44	33.3	28	25.2	48	22.5	49	18.4
Not employed off the farm	154	73.7	88	66.7	83	74.8	165	77.5	218	81.6
Total	209	100.0	132	100.0	111	100.0	213	100.0	267	100.0

inverse relationship as higher percentages of the operators in the lower income categories were employed off the farm. This is consistent with the information presented in Table 11 which indicates that the average net cash farm income of operators working off the farm was only about 70 percent of the income of their counterparts who were not working off the farm.

In order to evaluate the relative significance of various individual, family, farm, area, and financial characteristics in determining farm operators' decisions to work off the farm, a multiple discriminant analysis was conducted. Discriminant analysis is a statistical technique for classifying an item into one of several mutually exclusive classes on the basis of certain of its properties or characteristics (Bauer and Jordan 1971; Duncan and Leistritz 1972; Hallberg 1971). It is thus well suited to problems where the dependent variable is categorical rather than quantitative.

The dependent variable in this analysis was whether the operator worked off the farm in 1984. Explanatory variables were of five general types, describing a variety of individual, family, farm, area, and financial characteristics. These included the following:

Individual

Operator age--in years

Operator education--six levels, from eighth grade or less (1) to completed college (6)

Family

Number of children less than age 5

Number of children aged 5 through 18

Number of children aged 19 through 22

Employment status of spouse--employed off the farm = 1; not employed off the farm = 0

Farm

Farm type--crop, beef, dairy, or diversified (as previously discussed)

Acres operated

Gross farm income

Financial

Net cash farm income

Total farm family income less off-farm employment earnings and family living expenses

Debt-to-asset ratio

Area

Population of county

Population of largest town in county

County type--SMSA, urban, adjacent, or remote

The operator's age was expected to have a negative effect on the propensity to work off the farm, and operator's education was expected to have a positive influence (Simpson and Kapitany 1983; Sumner 1982). The number of children was not expected to have a major influence on the operator's off-farm work decision, but these variables were included in the

models for both operator and spouse in order to evaluate differences in effects. Operators of livestock farms (particularly dairy farms) were expected to be less likely to work off the farm because of the time requirements associated with livestock care. Acres operated and gross farm income were included as alternative measures of farm size and were expected to be negatively associated with off-farm work. Net cash farm income, total farm family income less off-farm employment earnings and family living expenses, and the debt-to-asset ratio were included to evaluate possible effects of financial stress on the off-farm work decision. The income variables were expected to be negatively associated with off-farm work while the debt-to-asset ratio was expected to have a positive relationship. Finally, area characteristics were included to determine whether off-farm employment was more common for operators who lived in more populous counties or near larger towns where job opportunities might be more numerous.

The discriminant function was estimated using the BPMD 7M stepwise discriminant analysis program (Dixon et al. 1981). A tolerance level of 0.01 was specified which in effect ensured that all variables selected for the discriminant function would be significant at the 5 percent level.

The results of the discriminant analysis are summarized in Table 13. Seven variables met the statistical criterion to be included in the

TABLE 13. DISCRIMINANT ANALYSIS RESULTS, OPERATOR WORKED OFF THE FARM IN 1984

Variable	Order of Entry	Coefficient For: Operator Did Not Work Off Farm	Coefficient For: Operator Did Work Off Farm	F Value
Operator's age	1	0.72960	0.70199	34.4*
Acres operated	2	0.00013	-0.00025	12.6*
Dairy farm	3	6.02300	4.91932	11.3*
Spouse was employed off the farm	4	2.03668	2.58655	8.8*
Beef farm	5	1.04470	1.77937	6.5
Operator education	6	6.12180	6.31120	4.9
Debt-to-asset ratio	7	0.08375	0.09048	5.0

Notes: F value for equation = 12.4*; percent of observations correctly classified = 65 percent; canonical correlation = 0.321.

*Significant at the 1 percent level.

equation. All were significant at the 5 percent level, and four were significant at the 1 percent level. The effects of the individual variables on the operator's decision to work off the farm are determined by comparing the values of the coefficients in the second and third columns of Table 13. If the coefficient in column 2 is larger, the variable has a negative influence on off-farm work by farm operators, whereas if the coefficient in column 3 is larger, the variable has a positive influence. Most variables have the expected effects on off-farm work participation. Operator age, acres operated, and dairy farm type all have a negative influence on the decision to work off the farm. In other words, operators who were older or who operated large farms or dairy farms tended not to be employed off the farm. On the other hand, operators with higher levels of education, higher debt-to-asset ratios, and spouses who were employed off the farm were more likely to hold off-farm jobs. The beef farm type had a positive influence on off-farm work decision, in contrast to the hypothesized negative effect of any type of livestock. Possible explanations for this result are that (1) most beef operations are found in western North Dakota, where off-farm job opportunities have been more extensive than in some other areas of the state as a result of petroleum and coal development and/or (2) beef producers have been under considerable financial pressure for several years as a result of unfavorable cattle prices and thus may feel special pressure to supplement their farm income with off-farm earnings.

Spouses. Of the farm operators surveyed, 86 percent (or 800 operators) were married. Of these, 31 percent indicated that their spouse had been employed in an off-farm job in 1984 (Table 14). As was the case with operators, substantial regional variation can be noted with higher than average employment rates found in Regions 3, 4, and 8. Of the spouses who had not been employed in 1984, 6.6 percent indicated they planned to look for work off the farm in 1985. Thus, about 36 percent of all spouses represented in the survey were either employed off the farm or looking for off-farm work (Table 14).

A profile of North Dakota farm operators' spouses who were employed off the farm in 1984 is provided in Table 15. It can be noted that, on the average, spouses who worked off the farm were younger, possessed higher levels of education, and had slightly more children under the age of 18 than their counterparts who did not work off the farm. They were more likely to be associated with crop or beef farms and to have spouses who were also employed off the farm. They came from farms that were only slightly smaller (either by acreage or gross income) than their counterparts who were not employed off the farm. Their farms were likely to have smaller net cash farm income and higher debt-to-asset ratios than for those who did not work off the farm. The relationship between the farm's debt-to-asset ratio and the spouse's off-farm employment status was similar to that for farm operators.

The relationship between net cash farm income and employment status of the spouse is not entirely clear (Table 16). However, spouses from farms with net cash farm income of $5,000 or less were more frequently employed off the farm than those from farms with net cash farm incomes greater than $20,000.

TABLE 14. OFF-FARM EMPLOYMENT STATUS OF SPOUSE IN 1984 BY REGION

Employment Status	Region 1		Region 2		Region 3		Region 4		Region 5		Region 6		Region 7		Region 8		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Was your spouse employed in an off-farm job in 1984?																		
Yes	10	25.0	30	25.2	34	41.5	32	41.0	29	27.4	48	32.4	32	22.4	34	40.5	249	31.1
No	30	75.0	89	74.8	48	58.5	46	59.0	77	72.6	100	67.6	111	77.6	50	54.5	551	68.9
Total	40	100.0	119	100.0	88	100.0	78	100.0	106	100.0	148	100.0	143	100.0	84	100.0	800	100.0
Is your spouse planning to look for an off-farm job in 1985?																		
Yes	0	0.0	7	7.1	4	7.7	6	12.8	5	6.3	2	1.9	11	9.1	4	7.4	39	6.6
No	32	100.0	91	92.9	48	92.3	41	87.2	74	92.7	103	98.1	110	90.9	50	92.6	549	93.4
Total	32	100.0	98	100.0	52	100.0	47	100.0	79	100.0	105	100.0	121	100.0	54	100.0	588	100.0
Percentage who are either employed off the farm or planning to look for an off-farm job in 1985.		25.0		31.1		43.2		48.7		32.1		33.8		30.1		45.2		36.0

TABLE 15. SELECTED CHARACTERISTICS OF NORTH DAKOTA FARM SPOUSES EMPLOYED OFF THE FARM AND THOSE NOT EMPLOYED OFF THE FARM

Item	Units	Employed Off the Farm	Not Employed Off the Farm
Age:			
Average age	Years	39.2	44.3
Distribution:			
Less than 25	Percent	15.3	19.9
25 to 34	Percent	28.7	15.3
35 to 44	Percent	24.7	21.8
45 to 54	Percent	24.2	25.6
55 and older	Percent	7.1	17.4
Education:			
Eighth grade or less	Percent	2.5	6.7
Some high school	Percent	2.8	5.7
Completed high school	Percent	30.0	37.5
Attended college or other post-secondary school	Percent	39.1	34.1
Completed college	Percent	25.5	16.1
Children:			
No. less than age 5 (avg.)	Number	0.37	0.21
No. age 5-18 (avg.)	Number	0.89	0.99
Distribution (children less than 18):			
0	Percent	38.8	46.9
1	Percent	18.3	16.2
2	Percent	25.7	17.1
3	Percent	13.1	12.6
More than 3	Percent	4.1	7.1
Employment status of spouse:			
Spouse employed off the farm	Percent	34.3	19.8
Spouse not employed off the farm	Percent	65.7	80.2
Farm type:[a]			
Beef	Percent	16.0	12.5
Crop	Percent	70.9	67.2
Dairy	Percent	3.0	6.5
Diversified	Percent	10.1	13.8
Acres Operated:			
Average	Acres	1,575.7	1,641.4
Distribution:			
Less Than 500	Percent	10.4	9.2
500 to 999	Percent	28.4	24.7
1,000 to 1,499	Percent	22.4	25.6
1,500 to 1,999	Percent	11.2	16.1
2,000 and over	Percent	27.6	24.4

- Continued -

TABLE 15. SELECTED CHARACTERISTICS OF NORTH DAKOTA FARM SPOUSES EMPLOYED OFF THE FARM AND THOSE NOT EMPLOYED OFF THE FARM (CONTINUED)

Item	Units	Employed Off the Farm	Not Employed Off the Farm
Gross farm income:			
Average	Dollars	100,296.7	107,382.8
Distribution:			
Less than $40,000	Percent	24.8	19.7
$40,000 to $99,999	Percent	39.8	40.2
$100,000 to $249,999	Percent	29.9	32.2
$250,000 and over	Percent	5.5	7.9
Net cash farm income:			
Average	Dollars	11,051.0	16,449.0
Distribution:			
Negative	Percent	28.9	22.0
0 to $9,999	Percent	24.5	19.9
$10,000 to $19,999	Percent	22.9	25.1
$20,000 and over	Percent	23.7	33.0
Debt-to-asset ratio:			
Average	Percent	40.7	33.4
Distribution:			
.00 to .40	Percent	56.4	63.9
.41 to .70	Percent	26.7	22.3
Greater than .70	Percent	16.9	13.8
County population:			
Less than 5,000	Percent	28.0	29.0
5,000 to 9,999	Percent	32.8	33.4
10,000 to 24,999	Percent	27.6	22.3
25,000 and over	Percent	11.6	15.3
County type:[b]			
SMSA	Percent	9.3	11.6
Urban	Percent	8.6	8.7
Adjacent	Percent	53.0	59.9
Remote	Percent	29.1	19.9

[a]A farm was classified as beef, crop, or dairy if more than 50 percent of gross farm income came from that source. Farms not receiving 50 percent or more of gross farm income from one of these sources were classified as diversified.

[b]SMSA = Counties designated as Standard Metropolitan Statistical Areas (SMSAs).
Urban = Counties with a city with a population of 10,000 or more but which are not SMSAs.
Adjacent = Counties that border one or more SMSA or urban counties.
Remote = Counties which fall into none of the first three categories.

TABLE 16. OFF-FARM EMPLOYMENT OF SPOUSE IN 1984 BY NET CASH FARM INCOME CATEGORIES OF NORTH DAKOTA FARMERS

Employment Status	Net Cash Farm Income									
	Negative		$0 to $4,999		$5,000-$9,999		$10,000-$19,999		$20,000 & Over	
	No.	%	No.	%	No.	%	No.	%	No.	%
Spouse employed in off-farm job	68	37.2	40	36.4	27	31.0	54	31.2	60	24.3
Spouse not employed in off-farm job	115	62.8	70	63.6	60	69.0	119	68.8	187	75.7
Total	183	100.0	110	100.0	87	100.0	173	100.0	247	100.0

To evaluate the relative significance of various characteristics in determining the decisions of farm operator's spouses to work off the farm, a multiple discriminant analysis was again conducted. Explanatory variables were the same as those in the previously described analysis of farm operators except that the spouse's age and education were used rather than the operator's. Statistical procedures were the same as those for farm operators.

The results of the discriminant analysis are summarized in Table 17. Six variables met the statistical criterion to be included in the equation. All were significant at the 5 percent level, and five were significant at the 1 percent level. Most variables had the expected effect on the spouse's off-farm work participation. Spouses who were younger and more highly educated and whose spouse was employed off the farm were more likely to work off the farm themselves. Those who had children between the ages of 5 and 18 were less likely to be employed, after controlling for the effects of age and education. The effect of the variable, total farm family income less off-farm employment earnings and family living expenses, is not immediately clear from the coefficients presented in Table 17. However, examination of the means of the variable for both groups strongly suggests that low levels of this variable are associated with off-farm work. Thus, some farm spouses are apparently seeking off-farm work to supplement farm income which is inadequate to support family living.

Number of Days Worked Off the Farm

Once a farm operator or spouse decides to work off the farm, a second major decision deals with the amount of time to devote to off-farm

TABLE 17. DISCRIMINANT ANALYSIS RESULTS, SPOUSE WORKED OFF THE FARM IN 1984

Variable	Order of Entry	Coefficient For: Spouse Did Not Work Off the Farm	Coefficient For: Spouse Did Work Off the Farm	F Value
Spouse's education	1	6.36658	6.90402	50.5*
Spouse's age	2	0.62989	0.59521	14.2*
Children aged 5 through 18	3	1.15649	0.86148	16.8*
County type = adjacent	4	2.38624	1.86474	9.3*
Total farm family income less off-farm earnings and family living expense	5	-0.00002	-0.00002	7.5*
Spouse is employed off the farm	6	2.39988	2.92864	6.0

Notes: F value for equation = 18.3*; percent of observations correctly classified = 66 percent; canonical correlation = 0.378.

*Significant at the 1 percent level.

employment. For those operators who were employed off the farm in 1984, the average number of days worked was 108. About 53 percent of these operators worked less than 100 days off the farm, whereas 16 percent worked more than 200 days at their off-farm job. For spouses who were employed, the average number of days worked was 166. Only 23 percent of the spouses worked less than 100 days off the farm, and 40 percent worked more than 200 days.

A number of factors could affect the number of days that farm operators and spouses work off the farm. While age and education can affect the job opportunities available to an operator or spouse, farm and family characteristics can affect the amount of time available for off-farm work (Napier and Carter 1983; Sumner 1982; Singh 1983). Financial stress could provide an incentive for additional off-farm work, while geographical location may influence the opportunities that are available (Napier and Carter 1983).

In order to evaluate the effects of these factors on off-farm work, stepwise regression analysis was utilized. Separate equations were estimated for farm operators and spouses. The independent variables considered included those described previously in the analysis of the decision to work off the farm. In addition, three explanatory variables were included. These were (1) the number of years the operator (or spouse) has worked at his (her) current off-farm job, (2) the earnings per day of the operator (or spouse) in 1984, and (3) for operators only, the total number of years of experience in off-farm work.

Two regression models were estimated for farm operators and spouses. Both models were estimated by ordinary least squares (OLS) regression using the stepwise option of the Statistical Analysis System (SAS). The partial F probability level to exclude a variable was set at 0.10. The first model estimated in each case included all explanatory variables discussed previously except earnings per day. All operators (spouses) who worked off the farm in 1984 and who had complete data were used in estimating this model. The second model (Model 2) included the variables previously discussed and also the earnings per day of the operator (spouse) from off-farm work. Because of the structure of the questionnaire, households in which both operator and spouse were employed off the farm were dropped from this analysis.

Operators. Results of the regression analysis for farm operators are shown in Table 18. In Model 1, three variables met the statistical criterion for inclusion. Years of experience in off-farm work was positively associated with the number of days worked as was the debt-to-asset ratio. Operators of crop farms worked an additional 24 days off the farm compared to their counterparts with the other farm types. In Model 2, years of experience was again included together with the adjacent county type and earnings per day. The negative sign for earnings per day is opposite to that expected; a possible explanation is that operators with low-paid jobs worked additional hours in order to achieve a predetermined or target level of off-farm earnings. This behavior would be consistent with a need to meet fixed debt service commitments. Examination of Table 18 also reveals that a number of variables, such as earnings, age, and net farm income, which have been found in other studies to be closely related to the extent of off-farm work, were not found to be statistically significant in this analysis. A possible explanation is that job opportunities in rural North Dakota may be more limited than in many other regions and thus may offer farm operators less flexibility in determining their hours of work.

Spouses. Results of the regression analyses for spouses are shown in Table 19. In Model 1, six variables met the statistical criterion for inclusion. All variables are significant at the 10 percent level and two (acres operated and years worked at this job) are significant at the 1 percent level. Signs of the variables are generally consistent with economic theory and a priori reasoning. Acres operated and gross farm income, both measures of farm size, have negative signs whereas years worked at the present job and beef farm type have positive signs. In other words, spouses from larger farms with higher sales tended to work fewer days while those who had worked several years at their job or came from beef farms worked more days.

TABLE 18. REGRESSION EQUATIONS FOR DAYS WORKED OFF THE FARM BY NORTH DAKOTA FARM OPERATORS, 1984

Variable Description	Model 1 Estimated Coefficient	Model 1 F Value	Model 2 Estimated Coefficient	Model 2 F Value
Constant	53.55	--	146.97	--
Years of experience in off-farm work	4.48	29.0*	4.70	16.4*
Debt-to-asset ratio	0.38	3.4	--	--
Crop farm	24.09	3.1	--	--
Earnings per day	--	--	-0.45	5.2
Adjacent county type	--	--	-35.87	3.9
	N = 164		N = 85	
	R^2 = 0.17		R^2 = 0.19	

*Significant at 1 percent.

In Model 2, six variables again met the criterion for inclusion; four of these were also included in Model 1. In each case, the signs of the variables are similar between the two models. Two new variables appear in Model 2. The number of children aged 5 through 18 appears to replace the number of children under age 5 and the number aged 19 through 22. The spouse's earnings per day also enter the equation, but with a negative sign, in contrast to the findings of other researchers who have estimated a positive relationship between wage rates and amount of labor supplied (Napier and Carter 1983; Sumner 1982; Singh 1983).

Decision to Look for Off-Farm Work

As noted earlier, the financial pressures which have affected many farmers during the last few years are apparently causing some operators and their spouses to look for off-farm work. As reported in Tables 10 and 14, more than 9 percent of the farm operators who were not employed off the farm in 1984 indicated an intention to seek off-farm work in 1985 while almost

TABLE 19. REGRESSION EQUATIONS FOR DAYS WORKED OFF THE FARM BY NORTH DAKOTA FARM OPERATORS' SPOUSES, 1984

Variable Description	Model 1 Estimated Coefficient	Model 1 F Value	Model 2 Estimated Coefficient	Model 2 F Value
Constant	193.45	--	155.86	--
Acres operated	-0.01800	13.02*	-0.02053	12.87*
Years worked at this job	2.81	10.28*	4.69	17.62*
Beef farm	39.94	5.15	39.49	3.54
Number of children under age 5	-22.91	7.55*	--	--
Number of children aged 5-18	--	--	13.94	4.68
Gross farm income	-0.00012	4.99	-0.00012	3.11
Number of children aged 19-22	-15.09	3.44	--	--
Earnings per day	--	--	-0.01486	4.9
	N = 206		N = 132	
	R^2 = 0.21		R^2 = 0.27	

*Significant at 1 percent.

7 percent of spouses indicated similar intentions. The individual, family, farm, financial, and area characteristics associated with the decision to seek off-farm work are examined in this section.

Farm Operators. Characteristics of farm operators who indicated they would seek off-farm employment in 1985, as well as corresponding characteristics of their counterparts who would not, are presented in Table 20. Operators seeking off-farm work tended to be younger, to operate farms with lower than average gross and net farm income, and to have higher than average debt-to-asset ratios.

In order to evaluate the relative significance of various characteristics in determining farm operators' decisions to look for off-farm employment, discriminant analysis was again employed. Explanatory

TABLE 20. SELECTED CHARACTERISTICS OF NORTH DAKOTA FARM OPERATORS LOOKING FOR A JOB OFF THE FARM AND THOSE NOT LOOKING FOR WORK OFF THE FARM

Item	Units	Looking For Job Off the Farm	Not Looking for Job Off the Farm
Operator's age:			
Average age	Years	41.6	46.7
Distribution:			
Less than 25	Percent	5.7	2.4
25 to 34	Percent	26.5	16.3
35 to 44	Percent	25.7	22.6
45 to 54	Percent	22.9	25.8
55 and older	Percent	18.6	32.8
Marital status:			
Married	Percent	81.4	85.2
Single, widowed, divorced, etc.	Percent	18.6	14.8
Employment status of spouse:			
Spouse employed off the farm	Percent	27.1	24.2
Spouse not employed off the farm	Percent	72.9	75.8
Education of operator:			
Eighth grade or less	Percent	11.6	18.4
Some high school	Percent	15.9	9.0
Completed high school	Percent	30.4	36.8
Attended college or other post-secondary school	Percent	27.5	25.3
Completed college	Percent	14.5	10.6
Farm type:[a]			
Beef	Percent	17.1	11.9
Crop	Percent	68.6	67.2
Dairy	Percent	5.7	6.3
Diversified	Percent	8.6	14.5
Acres operated:			
Average	Acres	1,636.2	1,721.3
Distribution:			
Less than 500	Percent	10.0	7.7
500 to 999	Percent	27.1	24.8
1,000 to 1,499	Percent	20.0	24.5
1,500 to 1,999	Percent	18.6	15.0
2,000 and over	Percent	24.3	28.0

- Continued -

TABLE 20. SELECTED CHARACTERISTICS OF NORTH DAKOTA FARM OPERATORS LOOKING FOR A JOB OFF THE FARM AND THOSE NOT LOOKING FOR WORK OFF THE FARM (CONTINUED)

Item	Units	Looking For Job Off the Farm	Not Looking for Job Off the Farm
Gross farm income:			
Average	Dollars	85,985.3	114,114.5
Distribution:			
Less than $40,000	Percent	20.6	17.7
$40,000 to $99,999	Percent	48.5	40.0
$100,000 to $249,999	Percent	25.0	33.7
$250,000 and over	Percent	5.9	8.6
Net cash farm income:			
Average	Dollars	4,511.5	17,099.9
Distribution:			
Negative	Percent	28.6	23.0
0 to $9,999	Percent	30.2	18.1
$10,000 to $19,999	Percent	27.0	24.9
$20,000 and over	Percent	14.2	34.0
Debt-to-asset ratio:			
Average	Percent	52.9	31.1
Distribution:			
.00 to .40	Percent	35.8	67.9
.41 to .70	Percent	34.3	21.3
Greater than .70	Percent	29.9	10.8
County population:			
Less than 5,000	Percent	40.0	27.6
5,000 to 9,999	Percent	27.1	32.3
10,000 to 24,999	Percent	21.4	24.9
25,000 and over	Percent	11.4	15.1
County Type:[b]			
SMSA	Percent	8.6	11.6
Urban	Percent	2.9	8.9
Adjacent	Percent	67.1	57.0
Remote	Percent	21.4	22.5

[a]A farm was classified as beef, crop, or dairy if more than 50 percent of gross farm income came from that source. Farms not receiving 50 percent or more of gross farm income from one of these sources were classified as diversified.

[b]SMSA = Counties designated as Standard Metropolitan Statistical Areas (SMSAs).
Urban = Counties with a city with a population of 10,000 or more but which are not SMSAs.
Adjacent = Counties that border one or more SMSA or urban counties.
Remote = Counties which fall into none of the first three categories.

variables considered were the same as those used in the analysis of operators who worked off the farm in 1984. The results of the analysis are presented in Table 21. Four variables met the criterion for inclusion in

TABLE 21. DISCRIMINANT ANALYSIS RESULTS, OPERATOR LOOKING FOR WORK OFF THE FARM

Variable	Order of Entry	Coefficient For: Operator Not Looking For Work	Coefficient For: Operator Looking For Work	F Value
Debt-to-asset ratio	1	0.07423	0.09275	5.8
Operator's age	2	0.41067	0.37746	6.1
Net cash farm income	3	0.00001	0.00001	23.3*
County type = urban	4	2.30099	1.17420	5.0

Notes: F value for equation = 10.2*; percent of observations correctly classified = 68 percent; canonical correlation = 0.255.

*Significant at the 1 percent level.

the equation. Two of these directly reflect the farm's financial status (i.e., the debt-to-asset ratio and net cash farm income). The operator's age had a negative influence on the intention to seek off-farm work.

Spouses. Characteristics of farm operators' spouses who indicated they would seek off-farm employment in 1985 are summarized in Table 22. Spouses seeking off-farm work tended to be younger, to be more likely to have spouses who are employed off the farm, and to live on farms with below average net cash farm income and above average debt-to-asset ratios.

Discriminant analysis was utilized to assess the effects of various characteristics on the spouse's decision to seek off-farm work. Explanatory variables were the same as those used for spouses who worked off the farm in 1984. Results of the analysis are summarized in Table 23. Only two variables met the criterion for inclusion. One of these, and the first to enter the equation, was the farm's debt-to-asset ratio.

TABLE 22. SELECTED CHARACTERISTICS OF NORTH DAKOTA FARM SPOUSES LOOKING FOR A JOB OFF THE FARM AND THOSE NOT LOOKING FOR WORK OFF THE FARM

Item	Units	Looking For A Job Off the Farm	Not Looking for Work Off the Farm
Age:			
Average age	Years	37.7	44.8
Distribution:			
Less than 25	Percent	12.8	8.0
25 to 34	Percent	30.8	16.8
35 to 44	Percent	35.9	24.0
45 to 54	Percent	15.4	30.2
55 and older	Percent	5.1	20.9
Education:			
Eighth grade or less	Percent	2.6	8.9
Some high school	Percent	2.6	7.0
Completed high school	Percent	59.0	39.7
Attended college or other post-secondary school	Percent	25.6	32.4
Completed college	Percent	10.3	12.0
Children:			
No. less than age 5 (Avg.)	Number	0.41	0.24
No. age 5-18	Number	1.46	1.14
Distribution (children less than 18):			
0	Percent	32.6	34.9
1	Percent	17.4	19.3
2	Percent	19.6	27.7
3	Percent	21.7	13.7
More than 3	Percent	8.7	4.4
Employment status of spouse:			
Spouse employed off the farm	Percent	33.3	18.0
Spouse not employed off the farm	Percent	66.7	82.0
Farm type:[a]			
Beef	Percent	12.8	12.9
Crop	Percent	69.2	67.2
Dairy	Percent	7.7	6.4
Diversified	Percent	10.3	13.5
Acres operated:	Acres	1,743.0	1,709.2
Average			
Distribution:			
Less than 500	Percent	12.8	6.0
500 to 999	Percent	18.0	24.1
1,000 to 1,499	Percent	18.0	27.0
1,500 to 1,999	Percent	15.4	17.3
2,000 and over	Percent	35.9	25.5

- Continued -

TABLE 22. SELECTED CHARACTERISTICS OF NORTH DAKOTA FARM SPOUSES LOOKING FOR A JOB OFF THE FARM AND THOSE NOT LOOKING FOR WORK OFF THE FARM (CONTINUED)

Item	Units	Looking For A Job Off the Farm	Not Looking for Work Off the Farm
Gross farm income:			
Average	Dollars	103,562.3	114,780.2
Distribution:			
Less than $40,000	Percent	15.8	17.5
$40,000 to $99,999	Percent	39.5	38.7
$100,000 to $249,999	Percent	39.5	34.8
$250,000 and over	Percent	5.3	9.0
Net cash farm income:			
Average	Dollars	4,212.8	17,818.9
Distribution:			
Negative	Percent	33.3	21.7
0 to $9,999	Percent	33.3	17.6
$10,000 to $19,999	Percent	22.2	24.6
$20,000 and over	Percent	11.2	36.1
Debt-to-asset ratio:			
Average	Percent	57.3	31.5
Distribution:			
.00 to .40	Percent	28.9	66.8
.41 to .70	Percent	39.5	21.4
Greater than .70	Percent	31.6	11.8
County population:			
Less than 5,000	Percent	26.1	26.9
5,000 to 9,999	Percent	34.8	33.3
10,000 to 24,999	Percent	19.6	27.7
25,000 and over	Percent	19.6	12.0
County type:[b]			
SMSA	Percent	12.8	10.9
Urban	Percent	5.1	9.8
Adjacent	Percent	56.4	59.7
Remote	Percent	25.6	19.5

[a]A farm was classified as beef, crop, or dairy if more than 50 percent of gross farm income came from that source. Farms not receiving 50 percent or more of gross farm income from one of these sources were classified as diversified.

[b]SMSA = Counties designated as Standard Metropolitan Statistical Areas (SMSAs).
Urban = Counties with a city with a population of 10,000 or more but which are not SMSAs.
Adjacent = Counties that border one or more SMSA or urban counties.
Remote = Counties which fall into none of the first three categories.

TABLE 23. DISCRIMINANT ANALYSIS RESULTS, SPOUSE LOOKING FOR WORK OFF THE FARM

Variable	Order of Entry	Coefficient For: Spouse Not Looking For Work	Coefficient For: Spouse Looking For Work	F Value
Debt-to-asset ratio	1	0.08813	0.11208	24.7*
Spouse's age	2	0.48794	0.44656	5.3

Notes: F value for function = 15.1*; percent of observations correctly classified = 71 percent; canonical correlation = 0.250.

*Significant at the 1 percent level.

Conclusions and Implications

The severe financial stress currently being experienced by many farm and ranch operators has prompted interest in off-farm income sources for farm families. This study examined the role and significance of off-farm income and employment for North Dakota farm families.

Earnings from off-farm employment and interest from savings or returns from off-farm investments were the most common sources of nonfarm income in 1984. Oil lease revenues also were a substantial source of income in the western regions of the state. Off-farm income accounted for about 42 percent of the total income of North Dakota farm families in 1984. Earnings from off-farm employment accounted for 44 percent of the total off-farm income; mineral lease payments for 22 percent; and interest, dividends, and similar revenue from off-farm investments for 34 percent.

Off-farm income appears to be critical in enabling some operators to meet their financial obligations. About 41 percent of the operators surveyed were unable to pay their operating costs and living expenses from current income. An additional 11 percent of the operators would not have been able to pay these costs and expenses if income from off-farm sources had not been available.

The percentage of North Dakota farmers and their spouses who work off the farm has been growing in recent years. Of the farm operators surveyed, 24 percent had worked off the farm in 1984, and 9 percent of the remainder intended to look for work off the farm in 1985. Of the operators who were married, 31 percent reported that their spouses had worked off the farm in 1984 while more than 6 percent of the remaining spouses intended to look for off-farm work in 1985.

Operators and spouses who worked off the farm shared a number of characteristics. They were younger than their counterparts who did not work off the farm and had somewhat higher levels of education. Their farms were smaller than average with lower levels of net cash farm income and higher debt-to-asset ratios. If one member of the couple was employed off the farm, this increased the probability that the other would be employed also.

Farm operators who reported off-farm employment in 1984 worked an average of 108 days. Spouses who were employed worked an average of 166 days. Regression analysis was used to estimate two models to explain differences in the extent of off-farm work. The debt-to-asset ratio was found to be significant in one of the models and was positively related to the number of days worked. For spouses, acres operated and gross farm income entered both models with a negative effect on days worked while the beef farm type and years worked at the job had positive effects in both models. Variables reflecting the number of children of different age classes entered both models, but with different signs.

Operators and spouses who indicated their intention to look for off-farm work in 1985 tended to be younger than average and to be operating farms with lower than average net cash farm income and higher debt-to-asset ratios.

The growing importance of off-farm employment and income to farm families indicates an increasing interdependence between agriculture and the nonfarm rural economy. Improved job opportunities in rural areas of North Dakota may be crucial to the survival of some small- and medium-sized farm operations. The role of rural development in promoting job growth and stability is thus becoming increasingly important to farm families.

APPENDIX TABLES

APPENDIX TABLE 1. TOTAL FARM FAMILY INCOME LESS FAMILY LIVING EXPENSES, PRINCIPAL PAYMENTS, OFF-FARM EARNINGS, AND MINERAL LEASE INCOME BY REGION, NORTH DAKOTA FARMERS

	Units	Region							
		SR1	SR2	SR3	SR4	SR5	SR6	SR7	SR8
Simulation 1									
Total farm family income less family living expense:									
Average	Dollars	27,960	9,013	10,022	13,457	15,551	7,889	-1,893	18,434
Distribution:									
Less than -$4,999	Percent	31.0	26.0	25.7	23.0	16.8	31.5	44.3	30.8
-$4,999 to 0	Percent	9.5	16.8	12.9	6.9	9.2	9.4	14.6	9.9
0 to $4,999	Percent	7.1	16.0	11.9	17.2	15.1	12.0	14.6	13.2
$5,000 to $19,999	Percent	9.5	23.7	25.7	24.1	26.9	22.6	17.1	19.8
$20,000 and over	Percent	42.9	17.6	23.8	28.7	31.9	24.5	9.5	26.4
Simulation 2									
Total farm family income less family living expense and principal payments:									
Average	Dollars	17,110	-701	-1,306	2,352	2,472	-7,196	-13,379	4,719
Distribution:									
Less than -$4,999	Percent	38.1	47.3	42.6	41.4	32.8	54.7	62.7	50.6
-$4,999 to 0	Percent	9.5	12.2	11.9	4.6	12.6	6.9	9.5	12.1
0 to $4,999	Percent	7.1	12.2	8.9	10.3	15.1	6.3	8.9	6.6
$5,000 to $19,999	Percent	9.5	13.7	16.8	19.5	13.5	18.2	12.7	9.9
$20,000 and over	Percent	35.7	14.5	19.8	24.1	26.1	13.8	6.3	20.9
Simulation 3									
Total farm family income less family living expense, off-farm earnings, and mineral lease income:									
Average	Dollars	6,885	2,085	4,442	7,930	11,607	4,136	-5,185	650
Distribution:									
Less than -$4,999	Percent	54.8	47.3	32.7	34.5	22.7	40.9	55.7	48.4
-$4,999 to 0	Percent	2.4	12.2	15.8	11.5	9.2	8.2	11.4	8.8
0 to $4,999	Percent	7.1	15.3	13.9	11.5	16.0	9.4	13.9	9.9
$5,000 to $19,999	Percent	16.7	12.2	17.8	18.4	24.4	20.1	13.3	22.0
$20,000 and over	Percent	19.1	13.0	19.8	24.1	27.7	21.4	5.7	11.0
Simulation 4									
Total farm family income less family living expense, off-farm earnings, mineral lease income, and principal payments:									
Average	Dollars	-3,965	-7,629	-6,887	-3,176	-1,470	-10,949	-16,671	-13,066
Distribution:									
Less than -$4,999	Percent	61.9	58.8	54.5	48.3	37.8	61.6	68.4	64.8
-$4,999 to 0	Percent	0.0	13.0	6.9	8.1	10.9	5.7	10.8	8.8
0 to $4,999	Percent	9.5	10.7	7.9	10.3	14.3	6.9	8.9	8.8
$5,000 to $19,999	Percent	11.9	6.1	14.9	12.6	14.3	14.5	7.6	8.8
$20,000 and over	Percent	16.7	11.5	15.8	20.7	22.7	11.3	4.4	8.8

APPENDIX TABLE 2. TOTAL FARM FAMILY INCOME LESS FAMILY LIVING EXPENSES, PRINCIPAL PAYMENTS, OFF-FARM EARNINGS, AND MINERAL LEASE INCOME BY TYPE OF NORTH DAKOTA FARMS

	Units	Type of Farm			
		Crop	Beef	Dairy	Diversified
Simulation 1					
Total farm family income less family living expense:					
Average	Dollars	13,538	10,230	-5,149	-3,401
Distribution:					
Less than -$4,999	Percent	23.0	41.2	45.1	47.9
-$4,999 to 0	Percent	10.5	12.6	19.6	13.5
0 to $4,999	Percent	13.8	12.6	13.7	15.6
$5,000 to $19,999	Percent	25.1	13.5	19.6	13.5
$20,000 and over	Percent	27.7	20.2	2.0	9.4
Simulation 2					
Total farm family income less family living expense and principal payments:					
Average	Dollars	1,602	-2,700	-20,392	-15,070
Distribution:					
Less than -$4,999	Percent	41.0	58.8	76.5	66.7
-$4,999 to 0	Percent	10.1	10.1	7.8	9.4
0 to $4,999	Percent	11.4	5.0	5.9	5.2
$5,000 to $19,999	Percent	16.1	11.8	7.8	12.5
$20,000 and over	Percent	21.4	14.3	2.0	6.3
Simulation 3					
Total farm family income less family living expense, off-farm earnings, and mineral lease income:					
Average	Dollars	7,424	-4,706	-7,358	-7,102
Distribution:					
Less than -$4,999	Percent	33.6	66.4	54.9	58.3
-$4,999 to 0	Percent	10.6	5.9	15.7	12.5
0 to $4,999	Percent	13.7	6.7	11.8	13.5
$5,000 to $19,999	Percent	20.4	12.6	15.7	9.4
$20,000 and over	Percent	21.7	8.4	2.0	6.3
Simulation 4					
Total farm family income less family living expense, off-farm earnings, mineral lease income, and principal payments:					
Average	Dollars	-4,512	-17,636	-22,601	-18,772
Distribution:					
Less than -$4,999	Percent	50.3	71.4	82.4	72.9
-$4,999 to 0	Percent	9.0	8.4	7.8	8.3
0 to $4,999	Percent	11.9	3.4	2.0	6.3
$5,000 to $19,999	Percent	11.9	11.8	5.9	8.3
$20,000 and over	Percent	16.9	5.0	2.0	4.2

APPENDIX TABLE 3. TOTAL FARM FAMILY INCOME LESS FAMILY LIVING EXPENSES, PRINCIPAL PAYMENTS, OFF-FARM EARNINGS, AND MINERAL LEASE INCOME, BY GROSS FARM INCOME, FOR NORTH DAKOTA FARMERS

	Units	Gross Income: Less Than $40,000	$40,000 to $99,999	$100,000 to $249,000	$250,000 and Over
Simulation 1					
Total farm family income less family living expense:					
Average	Dollars	1,160	8,619	11,502	41,605
Distribution:					
Less than -$4,999	Percent	31.8	27.4	29.0	22.7
-$4,999 to 0	Percent	19.0	12.3	8.3	4.6
0 to $4,999	Percent	22.9	16.6	6.9	4.6
$5,000 to $19,999	Percent	17.9	26.9	21.4	13.6
$20,000 and over	Percent	8.4	16.9	34.4	54.6
Simulation 2					
Total farm family income less family living expense and principal payments:					
Average	Dollars	-3,175	224	-4,809	3,521
Distribution:					
Less than -$4,999	Percent	45.8	45.4	51.5	47.0
-$4,999 to 0	Percent	19.0	12.3	3.3	3.0
0 to $4,999	Percent	13.4	9.7	8.3	3.0
$5,000 to $19,999	Percent	14.5	19.7	10.9	7.6
$20,000 and over	Percent	7.3	12.9	26.1	39.4
Simulation 3					
Total farm family income less family living expense, off-farm earnings, and mineral lease income:					
Average	Dollars	-5,347	150	5,803	37,562
Distribution:					
Less than -$4,999	Percent	56.4	40.3	35.9	24.2
-$4,999 to 0	Percent	14.5	12.0	8.0	4.6
0 to $4,999	Percent	15.1	18.0	6.9	4.6
$5,000 to $19,999	Percent	11.7	20.6	19.9	15.2
$20,000 and over	Percent	2.2	9.1	29.4	51.5
Simulation 4					
Total farm family income less family living expense, off-farm earnings, mineral lease income, and principal payments:					
Average	Dollars	-9,682	-8,244	-10,508	-521
Distribution:					
Less than -$4,999	Percent	60.9	57.1	55.4	48.5
-$4,999 to 0	Percent	15.1	10.6	4.0	4.6
0 to $4,999	Percent	12.3	10.6	8.3	4.6
$5,000 to $19,999	Percent	9.5	14.9	10.1	3.0
$20,000 and over	Percent	2.2	6.9	22.1	39.4

APPENDIX TABLE 4. TOTAL FARM FAMILY INCOME LESS FAMILY LIVING EXPENSES, PRINCIPAL PAYMENTS, OFF-FARM EARNINGS, AND MINERAL LEASE INCOME, BY OFF-FARM EMPLOYMENT STATUS, FOR NORTH DAKOTA FARMERS

		Off-Farm Employment Status					
		Married				Single	
	Units	Neither Employed	Respondent Employed	Spouse Employed	Both Employed	Not Employed	Employed
Simulation 1							
Total farm family income less family living expense:							
Average	Dollars	10,871	9,995	6,065	14,664	4,933	25,637
Distribution:							
Less than -$4,999	Percent	35.4	19.6	31.6	12.6	27.8	19.2
-$4,999 to 0	Percent	8.7	13.7	11.2	13.8	18.6	19.2
0 to $4,999	Percent	12.3	16.7	8.6	21.8	18.6	15.5
$5,000 to $19,999	Percent	19.1	28.4	24.3	24.1	13.6	30.8
$20,000 and over	Percent	24.5	21.6	24.3	27.6	15.5	15.4
Simulation 2							
Total farm family income less family living expense and principal payments:							
Average	Dollars	-1,800	-6,022	-8,078	4,340	-1,269	19,550
Distribution:							
Less than -$4,999	Percent	50.9	50.0	52.0	37.9	41.2	34.6
-$4,999 to 0	Percent	6.8	12.8	7.9	12.6	17.5	23.1
0 to $4,999	Percent	10.6	9.8	7.9	5.8	11.3	7.7
$5,000 to $19,999	Percent	11.8	11.8	14.5	27.6	16.5	23.1
$20,000 and over	Percent	19.8	15.7	17.8	16.1	13.4	11.5
Simulation 3							
Total farm family income less family living expense, off-farm earnings, and mineral lease income:							
Average	Dollars	7,085	-2,190	-2,211	-3,750	3,984	17,313
Distribution:							
Less than -$4,999	Percent	38.0	50.0	48.0	56.3	28.9	38.5
-$4,999 to 0	Percent	7.8	15.7	9.2	9.2	18.6	15.4
0 to $4,999	Percent	13.0	6.9	10.5	11.5	19.6	19.2
$5,000 to $19,999	Percent	19.3	13.7	17.1	16.1	18.6	19.2
$20,000 and over	Percent	21.9	13.7	15.1	6.9	14.4	7.7
Simulation 4							
Total farm family income less family living expense, off-farm earnings, mineral lease income, and principal payments:							
Average	Dollars	-5,585	-18,207	-16,354	-14,073	-2,217	11,226
Distribution:							
Less than -$4,999	Percent	53.1	68.6	65.1	71.3	42.3	50.0
-$4,999 to 0	Percent	6.8	8.8	5.9	8.1	17.5	26.9
0 to $4,999	Percent	10.9	6.9	7.9	6.9	11.3	11.5
$5,000 to $19,999	Percent	11.8	7.8	10.5	9.2	16.5	3.9
$20,000 and over	Percent	17.5	7.8	10.5	4.6	12.4	7.7

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