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FINAL REPORT TO THE FORD FOUNDATION AND
THE RURAL ECONOMIC POLICY PROGRAM OF
THE ASPEN INSTITUTE OF HUMANISTIC STUDIES

"How Family Farms Deal With Unexpected Financial Stress"

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TABLE OF CONTENTS

	Page
Acknowledgements.....	i
Table of Contents.....	ii
Introduction.....	1
Title, Researchers, Dates.....	1
The Research Problem.....	1
Objectives.....	1
The Study Area and Economic Environment.....	2
The Rural Nature of the Study Area.....	2
Farm Characteristics.....	2
Economic Conditions in the 1980s.....	3
Methodological Issues.....	5
Research Plan.....	5
Conducting the Survey.....	6
Tests for Nonrespondent vs Respondent Differences.....	7
Estimation Procedure for Land Valuation.....	8
Research Findings About Farm Exits.....	10
Farm Exit in Southwestern Wisconsin from 1982 to 1987.....	10
Farm Exit Issues.....	10
Reasons for Leaving Farming.....	11
Classifying Voluntary and Involuntary Farm Exits.....	12
Farming Plans and Reason for Exit.....	13
1982 Characteristics of Future Farm Exits and	
Continuing Farmers.....	13
Farm Exit Characteristics in 1982 and 1986.....	19
Transition and Adjustment to Farm Exit.....	21
Year of Farm Exit.....	21
Migration of Farm Exits.....	22
Disposition of Assets.....	25
Farm Exit and Community Economic Development.....	25
Nonfarm Employment.....	26
Household Income.....	26
Concluding Comments.....	27

	Page
Research Findings About Continuing Farmers.....	29
Wisconsin Farmers That Survived From 1982 to 1987.....	29
Farmers' Business Response to Financial Stress.....	29
Assets, Debt and Net Worth of Continuing Farmers.....	31
Household Income of Continuing Farmers.....	31
Off-Farm Work of Farm Operators and Spouses.....	35
Farm Households With and Without Off-Farm Work.....	36
Occupations of Multiple Job-Holding Farm Household Members.....	36
Hours Employed and Wage Rates.....	38
Distribution of Hours Worked by Farm Type.....	39
Distribution of Hours Worked by Farm Size.....	44
Distribution of Hours Worked by Financial Status.....	45
Years Education and Nonfarm Wage Rates.....	45
Farm Spouse Entry and Exit and the Off-Farm Labor Market...	45
Farm Poverty in Southwestern Wisconsin.....	47
Research in Progress.....	49
Farm Cost of Producing Milk.....	49
Recent Farm Entrant in Southwestern Wisconsin.....	50
Presentations Based on the Findings.....	52
Published Reports.....	53
Appendices	
A. Tests for Differences in Mean Characteristics of Respondents and Non-Respondents.....	54
B. Estimation of Land Values.....	56
C. Reasons Given by Respondents for Leaving Farming.....	58

METHODOLOGICAL ISSUES

Research Plan

The data for these analyses are from two surveys of the same random sample of 529 farm operators and their households, identified as the 1983 and 1987 Wisconsin Family Farm Surveys.

The first survey was made just at the end of the good economic times (covering 1982) and the follow-up survey with the identical persons was made (with the support of this Ford Foundation research grant) in early 1987.

Data in both surveys included family demographics, hours of farm and off-farm work, income by person and source, value of assets and debts by source, farm business characteristics, vocational training and nonfarm work experience of the operator and spouse, use of community institutions and resources, responses to financial stress, and plans for the future.

Longitudinal farm family surveys of this depth based on random samples are not common. Longer run plans include a study to identify, interview, and analyze persons that have entered farming in the study area since 1982 (the year of the first survey), and a third-wave survey in 1991 of them and the continuing farmers identified in the 1987 survey.

The questionnaire was developed mindful of the possibility of testing the following kinds of hypothesis:

- a) farm family financial viability worsened from 1982 to 1986
- b) farm families reduced their debts but asset values decreased more, resulting in decreased net worth
- c) farm families increased their hours worked and income received from off-farm employment
- d) net cash farm operating income and total cash family income from all sources were lower in 1986 than 1982
- e) farm operators that said (in 1983) that they planned to leave farming in five years extended their planned exit date
- f) farmers that left farming since 1982 did so involuntarily
- g) families below the poverty line in 1982 were also below in 1986
- h) the cash and farm resource costs of producing milk were lower in 1986 than in 1982
- i) farmers that submitted bids in the Dairy Herd Termination Program had larger debt-to-asset ratios, larger absolute levels of debt, and were closer to retirement than those who did not.

Conducting the Survey

The 1987 follow-up survey process included the following steps:

- a) Separate questionnaires were developed for the 1987 follow-up survey for the continuing farmers (about 1200 items of information) and for those who had left farming since 1982 (about 900 items of information). The former questionnaire was as identical as possible to the questionnaire used in the 1983 survey to insure comparability of data, plus questions regarding response to financial stress and an improved section on soil conservation practices.
- b) A 230 page "Enumerator's Manual" was prepared, and was used as the basis for a two-day enumerators' training workshop and as a field reference for the enumerators.
- c) The current addresses and phone numbers of the 529 respondents to the 1983 survey were verified or corrected with the assistance of county Extension personnel, the U. S. Postal System, and telephone directory assistance.
- d) Personalized letters were reproduced by computer, individually signed by the principal investigator, and sent to the farm operators. The letter discussed the importance of the survey, stressed the confidentiality of the information, and indicated that an enumerator would telephone and make an appointment for an interview at a time convenient to the respondent and at the respondent's residence.
- e) Enumerators were selected and hired, and the enumerators' training workshop was conducted.
- f) After the enumeration was begun, review workshops with small groups of enumerators were conducted in the field. Completed questionnaires were subjected to a field edit as they were completed and any ambiguities were resolved. The status of each of the 529 respondents in the 1983 survey was determined and interviews completed with 86 percent of them.
- g) Data from the interviews with continuing farmers were entered into a computer tape file by a commercial firm, and data from farm exits were entered into a computer spreadsheet. A 1600 equation FORTRAN program was developed for a "machine edit" of the data from the continuing farmers, testing for internal consistency, completeness, and reasonableness of the data. Consistency checks between the 1983 and 1987 data were also made for selected variables.

Tests for Nonrespondent versus Respondent Differences

When working with a random sample, there is reason for concern if some of the randomly identified subjects can not be reached or if for some other reason they can not be included in the final data set. The question is whether the subjects that do respond are valid representatives of the entire sample, and thus of the population from which the sample was drawn. That is, were the nonrespondents different from the respondents in important characteristics that affect the analyses that follow? However, if it can be determined that nonrespondents are not different from the respondents, then the researchers have reasonable grounds for accepting the characteristics of the respondents as representing the population from which the sample was drawn.

In the 1987 Wisconsin Family Farm Survey 72 (about 14 percent) of the 529 operators interviewed in 1983 declined to be reinterviewed in 1987. However, we obtained sufficient information to classify them as being continuing farmers in 1987 or a farm exit. Thus we had a basis for comparing nonrespondents with respondents within the continuing farmer group, within the farm exit group, and for all subjects combined. To determine if there were significant differences between any two groups, t-tests were conducted on group means.

Complete farm and family information for 1982 was available from the 1983 surveys for all subjects including those who declined to be reinterviewed in 1987. Thus, respondents and non-respondents could be compared on the basis of several important variables. These included 1982 data on gross farm sales, net cash farm operating income, total household income, age of the farm operator, years of education of the farm operator, and number of crop acres in the farm. January 1, 1983 data on assets, debt, and net worth were also compared.

The t-test used is designed to determine whether the difference between the means of two groups is significantly different from zero. The results of the t-tests are reported in appendix tables 1, 2, and 3 for farm exits, for continuing farmers, and for both groups taken together.

The null hypothesis that the difference in the group means was zero, was not rejected for any variable when comparing respondents and nonrespondents among the farm exits (appendix table 1). The only significant variable at the 90 percent confidence level was years of education of the farm operator among the continuing farmers (appendix table 2) and when comparing all respondents with all non-respondents (appendix table 3).

These results support the conclusion that nonrespondents were probably no different from a random selection from the sample, and thus our respondents adequately represent the population from which they were drawn.

Estimation Procedure for Land Valuation

In the interviews with farm operators during both surveys, the respondents were asked to estimate the market value of their farm assets, assuming the condition that they were willing sellers dealing with knowledgeable buyers. Of particular interest is the valuation of their farm land and buildings, the major component of farm assets. While the responses seemed reasonable and internally consistent in each survey year, comparisons between the responses made four years apart revealed some ambiguities, e.g. increased per acre value during a time of sharply declining land values. For this reason it was decided to estimate the value of farm land and buildings for each respondent, using the characteristics of the assets as a basis.

The value of farm land and buildings for both 1982 and 1986 were estimated and subsequently adjusted following a hedonic model of implicit price determination. Independent variables were selected and regressed on the logarithm of reported per acre value. The data sets for both years were combined.

For the purpose of the regression, several criteria were selected to avoid distortions arising from the unrepresentative influence of various kinds of outliers. Operators owning less than 20 acres were not included in the regression because the value of buildings generally skewed their per acre value upward. Accordingly, their property values were not estimated or adjusted.

Several specific farm businesses were also omitted in the regression because of unique circumstances thought to be distorting and unrepresentative of the other farms in the survey area. Some of these unique operations included orchards or farms maintaining other businesses on the property.

An attempt was also made to select the remaining operations that had been consistent in the reporting of their property value in both 1982 and 1986. A procedure was undertaken to determine which had reported relatively high (low, or average) values for land and buildings in both years. First the percentage difference between reported per acre values and the average recorded county sales value was calculated for both 1982 and 1986. Frequency intervals of 10 percent difference from county per acre values were then created.

Frequency intervals for 1982 were cross-tabulated against those of 1986. Intervals for 1982 were reported on the vertical axis from small percentage differences at the top to progressively larger differences below. Similarly, 1986 difference intervals were reported along the horizontal axis from left to right. The resulting table showed a generally diagonal distribution from upper left to lower right. Those directly on the diagonal represented operators who reported the same difference from recorded county values for both years. Observations along the general diagonal represented farms which reported consistent values with respect to recorded county sales values between years. Observations outlying to the lower left or upper right represented farms reporting a large decline or large increase in their difference from recorded sale values respectively.

A range was chosen around this diagonal which generally included those within two intervals below and within three intervals above the diagonal. Those outside this band were flagged as contradictory observations. Operations which reported contradicting values were reviewed more carefully to determine the reason for the apparent conflict. If no explanation (i.e. the sale or purchase of land) was found, the operation was omitted from the regression and later adjustment.

The variables included in the regression analysis and the fitted equation are reported in Appendix B.

RESEARCH FINDINGS ABOUT FARM EXITS

In this section we discuss a group of farm households that left farming between 1982 and 1987, report their farm characteristics, and their transition process out of farming.

Farm Exit in Southwestern Wisconsin From 1982 to 1987

Our data are from two surveys of the identical sample of 529 farm households in southwestern Wisconsin. The status of the sample farm operators first interviewed in 1983 at the time of the follow-up survey in early 1987 was as follows:

Deceased	23
Had left farming (Farm Exits)	106
Still farming in 1987 (Continuing Farmers)	<u>400</u>
Total	529

About twenty percent (106 sample subjects) of those who operated farms in southwestern Wisconsin during 1982 had left farming by 1987. We were able to interview 92 of the 106 farm exits and turn first to their information, and will later discuss the continuing farmers.^{3/}

Using methods that are explained later, we determined that 37 percent of the exits left farming involuntarily. Their leaving farming was a direct result of their adverse farm financial conditions. For the remainder, however, the decision to exit farming, while in an environment of financial stress, was based on other factors, such as age, health, and occupational mobility.

Farm Exit Issues Farm numbers in the USA have declined almost every year for over five decades. Farmers leaving farming through retirement, death, or from voluntary or involuntary mid-career farm business termination have exceeded the number of entrants most years since the 1930s.

^{3/} We had extensive information about the nonrespondents from the 1983 survey. In addition, we identified their current occupation and place of residence. We made statistical tests of the differences between the means for important variables for the respondents and nonrespondents using the 1983 survey data, and found them not to be different in matters of gross farm sales, net cash farm income, total household income, total assets, total debts, net worth, age of the farm operator, and the number of crop acres farmed. They were different only in that the nonrespondents on average had completed one less year of formal education. We concluded that nonrespondents were not different from a random sub-sample, and that data from respondents were appropriate for generalizing to all continuing farmers and farm exit households in the study area (see Appendix A).

The early 1980s were a period of farm financial stress and uncertainty. For some farm families the dramatic decline in asset and equity values forced them to give up farming. For others, the outlook for farming compelled them to consider career and lifestyle opportunities outside of farming. Involuntary exit because of farm financial stress captured wide public attention early in the 1980s, and the impression may remain that farm exit and financial stress are universally linked.

Public interest in farm exits is based in several issues. First, which operators leave farming affects the structure and characteristics of the farming industry that remains. If those who leave are different from those who remain in matters of farm size, ownership of resources, farm business organization, or input and product mix, then the farming industry will change with their departure. Throughout its history our country has held that an agricultural sector composed of a relatively large number of independent farm operators was the most desirable farming system, both for the strength and continuity of rural social structure and for the assurance of a relatively low cost and abundant food supply for the remainder of society. The concern now is whether the increased rate of farm exit observed in the early 1980s has meaningfully altered the nations' farming structure and made it less consistent with these national goals.

Second, the exit of farmers is of interest because the magnitude and incidence of any financial losses from their departure is not clear. Losses in farm asset values so far during this decade have averaged about \$100,000 per farm in Wisconsin, for example. Much of this loss has been absorbed in the balance sheets of continuing farmers, and some in the accounts of their lenders. When a farm business is dissolved and the assets liquidated, however, losses on paper in the accounting system become realized losses. The magnitude of such liquidation losses, and how they are distributed among rural businesses and community institutions, rural credit sources, the remaining farmers, and those who leave is of interest.

Finally, there is public concern for any segment of our population that is disadvantaged. If farmers are believed to be unfairly treated in their financial activities, or to have been victims of forces beyond their control, then the public may respond to those conditions. There may be the public perception that families that left farming in recent years did so because of financial stress. That impression could have been made (perhaps correctly) by the reporting of farm financial events in the early 1980s, often focusing on the disadvantaged circumstances of a particular family.

Reasons for Leaving Farming For those households that had left farming our survey questionnaire was modified to include information about how the family had adjusted since leaving farming, e.g. the employment status of adult family members, levels of wage and passive income, levels of debt including remaining farm debt, reasons for leaving farming, and the transition process used to leave farming.

The farm family's reasons for leaving farming may be complex and not readily subject to simple classification. Their reasons might be explored using two different sources of information: a) from what the farmer says about the circumstances of their leaving, or b) an outside evaluation of the financial and business data that are available from the farm business. In

the 1987 Wisconsin Family Farm Survey, we used the first option, and developed and asked two sets of questions about why the farm household left farming. The first set was open-ended, seeking from the subject in their own words their reasons for leaving farming. The second set required the respondent to rate the importance to them of several common reasons for farm exit. We used their responses to the latter set to classify why they had exited.^{4/}

Classifying Voluntary and Involuntary Farm Exits In many cases, there are multiple reasons for farm exit, and there may also be ambiguities among the reasons, or contradictions with the empirical evidence. In the cases of a farm foreclosure or a liquidation bankruptcy the reason for farm exit is unequivocally that of financial stress. Other reasons for farm exit include health, age, low income from farming, or another job opportunity with higher, less variable income. Some of these factors may also contribute to a financially stressful situation. For example, ill health may diminish an operator's ability to operate the farm, and financial difficulties may result. Age could also have a similar effect. Many farm families have also utilized off-farm employment to relieve financial stress. For some operators, however, the off-farm job may offer opportunities or security unavailable in farming. When these factors occur together, it is difficult to determine the main cause for farm exit.

To classify why farm families left farming, we first asked the former farm operators open-ended questions about why they left farming. Later we had them rate a list of factors as being from "not important" to "very important" in their decision to leave. Of the 91 subjects responding to these questions, 19 stated that age was a very important factor in their decision to leave farming, and 52 indicated that age was not an important factor at all. Low income from farming and the future financial outlook for farming were very important to at least a quarter of the respondents (Appendix Table 5).

Responses that indicated the importance of "low income received from farming", "repayment of debts", and the "possibility of foreclosure by a creditor" as reasons for leaving farming were used in sorting involuntary from voluntary exits. Farmers that rated each of the above three reasons from "somewhat important" to "very important", plus those who said that low income from farming was "very important", were considered to be "financially stressed". Their termination from farming was viewed as an involuntary exit. All others were considered to be voluntary exits (by retirement for reasons of age or disability plus job change through occupational mobility).^{5/}

^{4/} The analyses that follow will show that the group we identified as leaving farming for reason of financial stress were disadvantaged relative to the other farm exits in terms of farm income and total household income in 1982 and in net worth loss during the four years between the two surveys.

^{5/} Other criteria were tested, but inclusion in the "financially stressed" category by these persons was relatively stable.

In response to the open-ended question about "the major factors contributing to your decision to cease farming", the voluntary exits most often mentioned the age of the farm operator (44 percent) or the operator's health (35 percent). In response to the scale questions those conditions were considered to be "important" by about half of them (see table 1).

The age or health of a family member other than the operator was an "important" reason for exit for about one-fifth of the voluntary exits, but for only six percent of the involuntary exits.

In contrast, among the involuntary exits over half mentioned low farm income as a reason for exit, one-fifth mentioned the possibility of foreclosure, and ten percent cited repayment of debt (to the open ended question). In the scaled questions, low income from farming, repayment of debt, and the possibility of foreclosure were "important" reasons for 94, 62, and 47 percent of the stressed farmers, respectively.

Voluntary exit through occupational mobility may not be free of stresses related to finances, but it contains the notion of being "pulled" from the farm because of perceived nonfarm occupational advantages. In involuntary exit, in contrast, the preferred occupation is farming, but for financial reasons the operator (reluctantly) shifts to a nonfarm occupation, i.e. is "pushed" from farming. There was some "pull" effect from nonfarm employment opportunities on the stressed farmers; although only one volunteered "availability of off-farm work" as a reason for exit, half said that was an "important" reason for leaving farming.

A second kind of "push" effect was noted, as half of the financially stressed exits also acknowledged that family stresses were "important" in their decision to go, compared to one-fifth of the voluntary exits.

Farming Plans and Reasons for Exit In table 1 we present selected descriptive information for 91 farm exits sorted by voluntary and involuntary exit. In the 1983 survey we asked farm operators about their farming plans for the next five years, including the option of leaving farming. Neither exit group was particularly successful in carrying out those plans. Little difference was observed in the distribution of their future farming plans, with about 60 percent of the voluntary and 65 percent of the involuntary exits planning (in early 1983) to continue farming for five or more years (and not fulfilling that plan).

1982 Characteristics of Future Farm Exits and Continuing Farmers

Regardless of whether farm exit is considered to be a normal functioning of our market economy or instead thought to be a traumatic injustice to those affected, it would be useful for society and the persons involved to be able to anticipate who is likely to leave the farming industry in the future. Whether public intervention is directed at education to facilitate the decision making process, helping to implement the move, or attempting to keep the family on the farm, being able to identify the target audience is fundamental.

Table 1. Selected Characteristics of Voluntary and Involuntary Farm Exits, Southwestern Wisconsin, 1987

Item	Unit	Voluntary Exits	Involuntary Exits
Number of sample farms	Farms	57	34
Farming plans reported in 1982:			
Will continue to farm	Percent	59.6	64.7
Will leave farming within five years	Percent	<u>40.4</u>	<u>35.3</u>
		100.0	100.0
Reasons for exit that were rated "important":			
Operator's Age	Percent	49.1	17.6
Operator's health	Percent	45.6	14.7
Age or health of another family member	Percent	17.5	5.9
Low income from farming	Percent	15.8	94.1
Repayment of debt	Percent	1.8	61.8
Possibility of foreclosure	Percent	0	47.1
Availability of off-farm employment	Percent	19.3	50.0
Family stress related to farming	Percent	14.0	50.0

Source: 1983 and 1987 Wisconsin Family Farm Surveys.

^{a/} Do not sum because of rounding.

In this section we examine selected characteristics of farm households from their 1982 data, looking for differences among those who continued to farm in 1987 and those that had exited under voluntary and involuntary circumstances (see table 2). Our purpose is to seek differences in 1982 that might serve as signals of the events that were to follow. We turn first to their financial characteristics at the time of the first survey.

At the end of the 1982 survey year, those farmers that would still be farming in early 1987 held total assets worth about \$350,000 on average, while those in the exit groups averaged about \$75,000 less.

Those who would exit voluntarily held less than \$25,000 in debt compared to about \$85,000 for the continuing farmers, resulting in those two groups having about the same net worths of about \$250,000. Those who would exit for reasons of financial stress, however, held nearly \$100,000 in debt resulting in a much lower net worth of under \$170,000. Their level of debt, or the related debt-to-asset ratio do not by themselves indicate financial stress, however.

Debt-to-asset ratios of continuing, voluntary exit, and involuntary exit farmers were .22, .08, and .31 respectively at the start of 1983. The higher the ratio, the more interest and principal payments that must be met from the earnings of the financial and human resources of the farm operator. Because earnings in general are related to the level of assets, the higher the debt-to-asset ratio the less favorable the financial circumstances of the operator. While a lower ratio is considered more desirable than a higher ratio taken by itself, at these average levels the ratios do not by themselves show impending financial difficulty.

This is not the case with household income, however, particularly with the annual earnings of the farm business. At less than \$1200, the net cash farm operating income of those who will later be involuntary exits is clearly a problem, both at its absolute level and in comparison with the \$16,000 earned by the voluntary exits and \$21,000 by the continuing farmers. Higher levels of off-farm earned income do not make up the difference for the involuntary exits, and their total household income from all sources at \$16,000 is about half that received by the other two groups. Specific to the issue of involuntary exit, the \$16,000 would have been inadequate to meet the families' financial obligations for family living expenditures, mandatory principal payments on their near \$100,000 in debt, and the replacement of depreciable farm capital items such as farm machinery.

The low farm earning of the involuntary exit group is not caused by control of too few assets. Total assets owned was about the same as for the voluntary exits, and the number of crop acres farmed was about 30 percent larger.

Voluntary exits were older than involuntary exits, 63 years to 51 years, which was expected because they were approaching retirement age. Voluntary exits averaged 10.9 years of formal education, consistent with other evidence showing a negative correlation between age and years of school completed among Wisconsin farmers.

Table 2. Characteristics in 1982 of Farms by Their 1987 Farming or Exit Status, Southwestern Wisconsin

	Units	Continuing Farmers in 1987	Left Farming by 1987	
			Voluntary Exits ^{a/}	Involuntary Exits
Number of sample farms	Number	342	57	34
Financial statement Jan. 1, 1983:				
Total assets	Dollars	349,468	279,243	266,426
Total debts	Dollars	<u>84,210</u>	<u>24,778</u>	<u>97,961</u>
Net worth	Dollars	265,258	254,465	168,465
Debt to asset ratio ^{b/}	Ratio	.24	.09	.37
Household income (1982):				
Net cash farm operating income	Dollars	15,742	15,889	1,166
Off-farm earned income	Dollars	7,507	8,404	10,913
Nonfarm transfer and asset income	Dollars	3,502	6,900	3,427
Within household farm wage transfers	Dollars	<u>1,809</u>	<u>428</u>	<u>694</u>
Total household income	Dollars	28,560	31,621	16,201
Farm size				
Gross revenue	Dollars			
Crop acres operated	Acres	313.5	206.0	264.2
Farms with dairy as the main enterprise	Percent	71.1	56.1	55.9
Operator age (1983)	Years	47.2	58.7	46.9
Operator education	Years	11.6	11.1	10.6
Household size	Persons	4.0	2.8	3.5
Plan to leave farming in five years	Percent	10.2	40	35
Farm operators with a health disability (in 1982)	Percent	13.8	29.8	23.5
Experience operating a farm (by 1982)	Years	19.8	26.7	17.2
Use of educational programs:				
County Extension Service	Percent	68.1	43.9	55.9
University agricultural specialists	Percent	26.9	14.1	23.5
Vocational-technical institutes	Percent	25.1	15.8	17.6

Table 2 (continued)

	Units	Continuing Farmers in 1987	Left Farming by 1987	
			Voluntary Exits ^{a/}	Involuntary Exits
Use of government services:				
Forestry Service or forester	Percent	26.3	22.8	20.6
ASCS	Percent	73.1	50.9	67.7
Soil Conservation Service	Percent	51.2	45.6	58.8
Use of institutions:				
Member of farmer organization ^{c/}	Percent	53.2	35.1	41.2
Member of cooperative	Percent	87.7	86.0	85.3
Off-farm employment (1982):				
Operator				
Percent working	Percent			
Hours by those working	Hours			
Earnings by those working	Dollars	3,524	5,678	8,290
Spouse				
Percent working	Percent			
Hours by those working	Hours			
Earnings by those working	Dollars	2,622	2,446	2,660
Received household income from off-farm earnings	Percent			

Source: 1983 and 1987 Wisconsin Family Farm Surveys.

^{a/} Retirement for reasons of age or health plus exits through occupational mobility.

^{b/} Mean for all farms aggregated.

^{c/} Farm Bureau, National Farmers Organization, National Farmers Union, Grange.

However, although they were younger by 12 years, the involuntary exits had completed fewer (rather than more) years of schooling, on average finishing slightly more than two years of high school. The causes of their high school drop-out status are unknown, e.g. poor health, lack of motivation, poor work habits, etc. However, the positive relationship between years of formal education and income in other occupations is well documented, and it is plausible (but conjectural) that being high school drop-outs contributed later to their involuntary exit from their chosen occupation of farming.

Nearly one-fourth of the involuntary farm exits reported that in 1982 they had a health condition that limited at least partially their ability to work at least some time during the year. In this incidence of health problems they were more like the voluntary exits than the continuing farmers, even though the latter were much closer to them in age.

The involuntary exits had about as many years of farming experience as the continuing farmers, 17 years to about 20, and that small difference in years is probably less important than the learning that took place during those years. In this regard, the involuntary exits may have missed opportunities available in their home community, as reported in the following section.

Three major educational systems or programs with farm family orientation are available in all Wisconsin communities, as follows: a) farming, homemaking and youth programs from county Extension offices, b) meetings or consultation with agricultural specialists from the University of Wisconsin, and c) farm production and management classes from the vocational technical institutes. The involuntary farm exits were intermediate in their use of these three resources, a larger percentage using them than did the (older) voluntary exits, but a smaller percentage than by the continuing farmers.

Older farmers have fewer years until retirement in which to recover investments in human or physical capital made by participating in agricultural education programs, so their lower participation rates are understandable. However, the financially stressed exits were the same average age as the continuing farmers, and with about the same years of farming experience. There was evidence of a need by them for farm production and financial management assistance in 1982. That is, their net cash farm operating income from their 264 acres was less than \$1200 in 1982; their total household income of \$16,200 would have been inadequate to cover family living expenditures, capital replacement, and principal payments on debt that year; and their debt-to-asset ratio was .31 at the start of 1983. Higher rates of participation in the available agricultural education programs, as well as developing the general educational base from having completed high school, could have been to their advantage in successfully continuing in their farming career.

The involuntary exits were more nearly typical in their use of the federal government services available through the local forester and the county ASCS and SCS offices. They were also near the mean in their attendance at farmer organization meetings and in their membership in cooperatives.

Farm Exit Characteristics in 1982 and 1986

Major life changes, such as retirement for reasons of age or disability, usually carry with them some level of family and financial stress.

It is especially clear that involuntary exit from farming for financial reasons has been a major trauma for the families involved. In this section we explore the "before and after" characteristics of farm families that have been involved in leaving farming. The "before" information is from our 1983 survey and the "after" is from the follow-up survey in 1987.

The household size and composition in both groups had changed in ways that would be expected for units that were four years older than in 1982, i.e. with fewer children present and smaller average household size. The incidence of a disability that limited the former farm operators in the amount or kind of work they could do or in activities in the home also increased, affecting about one-third of the voluntary and one-fourth of the involuntary exits.

In Wisconsin, owning the farm that is operated has been a tradition among farmers, and for most, the value of their farmland and buildings is by far the largest component of their assets. Beginning in late 1981 the price of farmland in Wisconsin levelled after decades of generally rising prices, and in 1982 it experienced a modest decline. In 1983 the decline became precipitous, and by the time of our follow-up survey in early 1987 the erosion in asset values was severe. On average, the farmers in our study that continued to farm in early 1987 had suffered about \$100,000 decline in their net worth, mainly because of the decline in farmland values.

About three-fourths of the voluntary farm exits in our study still owned some farmland early in 1987. On average the assets of this group had declined about \$55,000 and their debts about \$12,000 during the intervening years between our surveys (see table 3). Their loss in net worth was about \$45,000 and their average net worth early in 1987 stood at \$210,000.

However, about one-third of the voluntary exits had sold some farmland during the intervening four years. If they had provided seller financing, i.e. had sold their farm under a "land contract", they are at some risk of default by the buyer. In that case, the farm would be returned to them, probably at a much lower value than when they sold it. Thus, the value of their assets (which included any outstanding balances from such buyers) would be overstated. The flow of income they had expected from the sale would be terminated.

Slightly less than half of the involuntary exits retained ownership of any farmland early in 1987. Their assets had declined in value by about \$180,000, both from decline in the value of their farmland and because of no longer owning farmland. This was partially offset by a reduction in debts from nearly \$100,000 in early 1983 to just under \$50,000 in early 1987. However, it remains that their net worth on average decreased over \$130,000 during the four years, and stood at \$36,500 early in 1987.

Table 3. Characteristics of Voluntary and Involuntary Farm Exits in 1982 and 1986, Southwestern Wisconsin

	Units	<u>Voluntary Exits</u>		<u>Involuntary Exits</u>	
		1982	1986	1982	1986
Number of sample farms	Farms	57	57	34	34
Household size	Persons	2.8	2.6	3.5	3.0
Children present	Persons	0.6	0.2	1.3	0.9
Other adults present	Persons	0.4	0.3	0.3	0.3
Operators with disability	Percent	29.8	35.1	23.5	26.4
Operators' nonfarm employment:					
Years during 1978 to 1981	Number				
Working nonfarm in 1982	Percent				
Working full-time in 1982	Percent				
Spouses' nonfarm employment:					
Years during 1978 to 1982	Number				
Working nonfarm in 1982	Percent				
Working full-time in 1982	Percent				
Financial statement:					
Assets	Dollars	279,243	223,118	266,426	84,504
Debts	Dollars	<u>24,778</u>	<u>12,549</u>	<u>97,961</u>	<u>48,001</u>
Net Worth	Dollars	254,465	210,569	168,465	36,503
Debt to asset ratio	Ratio	.09	.06	.37	.57
Household income:					
Net cash farm operating income	Dollars	15,889	1,510	1,166	-700
Nonfarm earned income	Dollars	8,404	11,730	10,913	17,679
Nonfarm transfer or asset income	Dollars	6,900	13,078	3,427	5,722
Within farm wage transfers	Dollars	<u>428</u>	<u>39</u>	<u>694</u>	<u>18</u>
Total household income	Dollars	31,621	26,357	16,201	22,719

For a second view of financial circumstances we turn to household income, and find that the involuntary exits had increased their total household income in 1986 by \$6,500 over their 1982 level. The increase came about from substantial increases in nonfarm earned income, and a lesser increase in transfer and asset income. Total household income for them was \$22,700 in 1986, and that amount was probably adequate to cover family living expenditures (for a family of three persons) and make principal payments on their remaining \$48,000 in debt. As they no longer were farming, no funds were needed to replace depreciating farm machinery and other capital. Relative to their financial obligations, their total family income was much improved in 1986 over their circumstances in 1982.

The 1986 total household income of the involuntary exits had increased and stood at \$22,700, but the income of the voluntary exits (at \$26,300) remained higher even though it had declined during the four years. The net cash farm operating income of the voluntary exits had declined, but was partially replaced by increased nonfarm earnings and transfer and asset income.^{6/} They had fewer household members to support and less debt to service than the involuntary exits so in general were still "better off" financially than the involuntary exits.

Transition and Adjustment to Farm Exit

In the preceding section, we contrasted the circumstances of each of the exit groups in the two study years, separated by four years. Now we turn to the transition that took place at some time during the four years, the transition out of farming. First, we turn to the year the transition took place.

Year of Farm Exit Measured by the value of farmland and buildings, the "good economic times" for Wisconsin farmers peaked in 1981, levelled in 1982, and deteriorated seriously in 1983. The timing between the advent of financial stress and the exit of farm families is of interest from the public intervention perspective, and our relatively small number of observations can shed some light on that process. From our 1983 survey we know with certainty who left farming in 1982, and from the 1987 survey who left in 1986. For the

^{6/} Among both the voluntary and involuntary exits 1986 was the year of exit from farming for some households. As they closed out their farm businesses, some net cash farm income was generated and is included in the group averages. None of these persons would have net cash farm income in 1987, however.

intervening three years, however, we must rely on the recall of the respondents for their year of exit, which injects some imprecision.^{1/}

Relatively few farmers in either the voluntary or involuntary groups left farming in 1982. After that an erratic pattern was displayed by the voluntary exits, with about 37 percent leaving in 1983 but only seven percent in 1984. The involuntary exits are considerably more uniformly distributed among 1983 through 1986, i.e. with a substantial time lag between the advent of financial stress and eventual exit.

Migration of Persons Who Left Farming From 1982 Through 1986 Relatively few of the 106 farm exits had moved far by the time we contacted them in early 1987, with 60 percent still living in their former farm residence, and 20 percent more still in the same school district. This suggests a minimum of disruption to the families involved and to the community in which they resided.

For those still living in their farm house no real estate transaction would have been necessary. For all of these families, children could continue in their same school without interruption, and the families' networks of church, family, friends, and business contacts could remain intact.

The eight percent that moved to adjacent counties and the seven percent that moved further away but were still within Wisconsin could continue living and working in a familiar culture or environment. The five percent of the exits that had moved out of state would have had the most adjustments to make, including sale of their residence, incurring the cost of moving, and dealing with the uncertainty associated with finding employment, working in a new job, and living in a new environment.

When they first left farming, relatively few of the voluntary farm exits moved a substantial distance from the community in which they had been farming, while about one-third of the involuntary exits immediately moved out of the area. By the time of the follow-up survey in early 1987, 74 percent of the voluntary exits had not yet moved from their farming residence, and only 12 percent of that entire group planned to move to a different residence than they occupied at that time. About three-fifths of the involuntary exits had left their farm residence by 1987, and relatively more of them were then living in the residence where they planned to stay.

^{1/} In the 1987 Family Farm Survey six respondents asserted that they had left farming prior to 1982. This inconsistency with our having interviewed them as farm operators in early 1983 is probably explained by our inclusive definition of who is a farmer compared with a farmer's view, i.e. consistent with the Census of Agriculture and the U.S. Department of Agriculture definitions, anyone producing and selling \$1000 of agricultural products in a normal year was considered to be a farmer in our study. Without hard evidence in which of 1983, 1984, or 1985 their status would have fallen outside our definition, we have included them among the 1983 exits, the year that is closest to the respondent's view of when they left farming.

Table 4. The Transition Out of Farming by Voluntary and Involuntary Farm Exits, Southwestern Wisconsin, 1982-87

	Unit	Status at Time of Farm Exit	
		Voluntary	Involuntary
Number of sample farms	Farms	57	34
Last year as a farm operator:			
1982	Percent	8.8	5.9
1983	Percent	36.9	20.6
1984	Percent	7.0	26.5
1985	Percent	19.3	26.5
1986	Percent	<u>28.1</u>	<u>20.6</u>
Total ^{a/}		100.0	100.0
Place of residence after farming exit:			
Initially same farm	Percent	75.5	55.9
Initially out of the community	Percent	7.0	32.4
Currently same farm	Percent	73.7	41.2
Currently out of the community	Percent	10.0	35.0
Plan to move in the future	Percent	12.3	5.9
Disposition of farm assets:			
Conveyed any land back to seller under land contract:			
Persons	Percent	0	17.8
Acres	Mean	- 199.5	
Conveyed any land back to mortgage holder:			
Persons	Percent	0	23.5
Acres	Mean	- 264.3	
Sold any land:			
Persons	Percent	31.6	23.5
Acres	Mean	154.0	140.5

Table 4 (continued)

	Unit	Status at Time of Farm Exit	
		Voluntary	Involuntary
Farm debt remaining after exit:			
Any farm debt	Percent	0	35.3
Past due property taxes	Percent	1.8	17.6
Legal fees owed	Percent	1.8	20.6
Capital gains taxes owed:			
Persons	Percent	5.3	8.8
Amount	Dollars	8,833	6,250
Current ownership of farm land:			
Respondents owning land	Percent	77.2	47.1
Acres owned by those owning	Mean	171.6	164.4

Source: 1987 Wisconsin Family Farm Survey.

a/ Do not sum because of rounding.

Disposition of Farm Assets Some farm assets, such as inventories of grain and livestock can readily be sold through well established markets in Wisconsin. Farm machinery and equipment are often sold through an auction on the farm premises when closing out a farm business. However, the sale of farm real estate, particularly on a declining market, can be a time consuming, lengthy process.

Lenders to farmers usually require a specific (but perhaps flexible) repayment schedule and a lien against the property purchased with the loan. If a financially stressed farmer is unable to make principal and interest payments as scheduled, or if the value of collateral falls to near the amount of the outstanding loan, there may be pressure from the lender for the farmer to dispose of the asset and close out the loan. One method of doing this is for the borrower to convey the title to the property back to the lender in exchange for being relieved of the obligation to repay the loan.

Among the involuntary exits, 18 percent conveyed land back to the seller under a (seller financed) land contract agreement, 24 percent did so with a land mortgage holder, and three percent conveyed ownership of machinery or livestock to a lender. No persons in the voluntary exit group were involved in such transactions, but about one-third sold some land, compared with about one-fourth of the financially stressed group.

Although they were no longer farming at the time of our follow-up survey in early 1987, the financially stressed exits still had some financial obligations remaining from their farm businesses. About one-third still owed debt that could be identified with the former farm business, about one-fifth still owed some past due farm property taxes, and one-fifth still owed related farm legal fees. Relatively small numbers in both exit groups owed capital gains taxes from the disposition of farm property.

About one-half of the involuntary exits still owned some farmland, and those owning land averaged 164 acres in their holdings. This compares with about three-fourths of the voluntary exits, who held 172 acres on average.

Farm Exit and Community Economic Development

The personal aspects of financial stress on farm families in the early to mid-1980s were widely reported and the impacts on the farming sector were well-documented. A public impression of wide-spread forced exit from farming with ominous implications for rural communities may have resulted. Some feared that lower farm income levels and loss of capital by farm operators and lenders would lead to reduced spending in the local economy, default on debt, abandoned farmsteads, idle farmland, closing of nonfarm businesses, and an exodus from the rural community.

The unexpected farm financial reversals of the 1980s were real. The loss in farm equity was costly to farmers, their lenders, and the merchants that had provided them credit. For some farm families the financial reversals were a traumatic experience that resulted in involuntary exit from farming. Nonfarm businesses in rural communities also noted the effects of the farm recession.

Measuring all the impacts of the farm recession on farm families, rural nonfarm businesses, and the rural community is a complex task.^{8/} In this section we consider only one aspect, the impacts of exit from farming during a period of farm financial stress.

The circumstances of a farm family and the reasons they have for leaving farming will influence the impact of their exit on the local community. However, the reasons for leaving farming usually turn out to be complex. As noted earlier, in our survey we judged that 37 percent had left farming involuntarily, and the remainder had left voluntarily through retirement and being "pulled" from farming by better opportunities elsewhere.

Nonfarm Employment One linkage between farm families or farm exit families with the local community is their participation in the nonfarm labor force. During 1986, 85 percent of the involuntary exits and 70 percent of their spouses were employed in nonfarm work. The relatively high employment rate for these former farm operators was probably facilitated by their past experience in the nonfarm labor market. Over two-thirds had been employed off-farm in the recent past, and about one-fifth continued with the same employer when they left farming. Nine percent of the involuntary exits said they were disabled and six percent were not working other reasons.

Among the voluntary exits, 49 percent had retired, 40 percent were employed, and 11 percent said they were disabled and could not work. Taken together, about 37 percent of all exits worked full-time in nonfarm work in 1986, plus about 21 percent who were working part-time. About 30 percent said that they had retired, and 10 percent reported that they could not work because of a disability.

Household Income Of special concern to the businesses and institutions in the rural community is the level of household income after farm exit, particularly for the persons that remained in the area. Besides earnings from the nonfarm employment mentioned above, some households received income from assets (e.g. interest and dividends), transfers (e.g. Social Security benefits), and (if 1986 was their farm to nonfarm transition year) they might have realized some net farm income or loss. For all exit households taken together, total net household income was about \$26,600 in 1986, compared to about \$22,000 four years earlier when they were all still farming. For reference, our survey farmers in the study area that continued to farm in 1986 averaged \$31,165 total household income from all sources (all data in current year dollars).

^{8/} Early in 1989 researchers from the Economic Research Service, U.S. Department of Agriculture (ERS, USDA) studied five areas of the nation where the drought had hit hardest. Their purpose was to determine the effects on farm income and on economic activity in the community. The study areas were located in Montana, North Dakota, Illinois, Ohio, and southwestern Wisconsin. The USDA analysts looked at direct income losses in the farm sector, the overall economic impacts on the regional economy, and the compensating effects of federal drought assistance programs. Their findings are reported in the March 1989 issue of Farmline magazine, available from the ERS, USDA at 1301 New York Avenue N.W., Washington, D.C. 20005-4788.

Considerable diversity is hidden in those averages, however. The voluntary exits averaged \$25,430 total household income in 1986, but their incomes were widely dispersed around that mean (only about two-thirds of them fell in the range between zero and \$50,000. The mean for the involuntary exits was \$22,720 with about two-thirds falling between \$11,000 and \$33,000. While income at the mean would have been more than adequate to cover minimum levels of consumption (average household size was 3.5 persons), families much below that level would have had financial difficulties.^{2/}

Concluding Comments on Farm Exits

The unexpected farm financial shocks of the early and mid-1980s were traumatic experiences for many farm families, but voluntary retirement for reasons of age or disability was the major reason for farm exit during that period. There was not a major exodus of families from their farming communities, and the most common situation was for the recent farm exit to be still living in the same house as when farming.

Of importance to the local communities was that almost all former farm operators that wanted nonfarm employment were working full-time or part-time by the time of our follow-up survey, and their total household incomes on average were improved over their farm income four years earlier. However, hidden within that mean income was great variation, and those with income much below the mean would have been constrained to minimum levels of consumption.

Among the persons in our sample, 34 left farming involuntarily for reasons of financial stress. Descriptive analyses confirmed their disadvantaged conditions in terms of farm and total household income in 1982 and loss of farm assets and net worth during the four year period. Their 1982 data provided signals of financial trouble in terms of less than \$1200 net cash farm operating income generated from \$266,000 in total assets (\$168,000 net worth) and 264 acres operated. We found that they had completed less formal education (they averaged only slightly more than two years of high school) and had participated less in the several farm education programs available in their communities than did those continuing to farm in 1987. Their total household income in 1982 was about half that of the continuing farmers and the voluntary farm exits, and was insufficient to cover their financial obligations for family living expense, principal payments on debt, and replacement of depreciable farm capital.

^{2/} Our data were for 1982 and 1986 and we can make valid comparisons between a household's income for those two years. A farm household could have experienced very low (or high) income in the intervening years, and we would not have any information on that. That is, our 1986 data may accurately reflect conditions after the adjustments had been made by the family, but they can not reflect the years in which the farm exit occurred (unless that happened to be in 1982 or 1986).

During their transition out of farming, some stressed farmers conveyed farm property to their lenders, and some sold some farmland. About one-third still owed farm business debt after they had left farming. Their net worth decreased from \$168,000 to \$36,500 during their transition out of farming. Over half continued to live in their farming residence when they first left farming and two-fifths remained there at the time of the follow-up survey.

The involuntary farm exits received higher total household income in 1986, after their farm exit, than while still farming in 1982. Their financial obligations were reduced because of having fewer persons in the household to support and much lower debt to service. In terms of a stream of income they were better off than in 1982, but were still disadvantaged in comparison to those who had left farming voluntarily.

The implications for public intervention are a) recent exits from farming may have taken place for reasons other than financial stress and any public policies should target their audience well, b) the lack of formal education (not completing high school) and less participation in adult farmer education programs are associated with farm financial stress and causality is plausible, suggesting additional criteria for public (and private) sector farm lenders, and c) exit from farming does not necessarily mean uprooting the farm family from their home community, but lack of mobility may reduce the opportunities for nonfarm employment.

RESEARCH FINDINGS ABOUT CONTINUING FARMERS

About three-fourths of the persons who were farmers in southwestern Wisconsin in 1982 were still operating farms in 1987. They had "survived" that far during a period of unexpected farm financial reversals and stress of a magnitude not seen in the nation's farming sector for five decades.

Wisconsin Farmers That Survived From 1982 to 1987

The decline in farm asset values, particularly farm land, during recent years is well documented. Prices of some major farm commodities, benefits from federal farm programs, and farm income in the Midwest on average have declined. Lenders have been unable to continue serving all of their farm borrowers, and some credit institutions are themselves facing difficult financial adjustments. The financial hardships of some individual farm families have received high visibility in state and national media.

However, under these difficult financial times three-fourths of the farmers have been able to survive, and some even prospered. More information about these continuing farmers may be useful to other farmers, rural business persons, public program managers, and public policy makers as they deal with current economic conditions. For some insights, we turn to the 1987 data from our sample farms in southwestern Wisconsin.

In this analysis we have used the same definition of "farm" as is used by the Census and the U.S. Department of Agriculture, i.e. a "farm" is the place where the agricultural production process takes place, and includes places with annual sales, or potential for sales, of \$1000 or more. The "farm operator" is the senior person who makes decisions concerning the farm enterprise and is responsible for the day to day operation.

Farmers' Business Responses to Farm Financial Stress

While involuntary exit is perhaps the most dramatic manifestation of farm business financial stress, farm decision-makers may respond in many less visible ways. In the 1987 Wisconsin Family Farm Survey we provided farmers a list of possible changes that they might have made in their farm businesses in response to the adverse financial conditions of recent years. For each item, farmers reported whether or not they had made such a change during the previous four years in response to the adverse financial conditions.

The percentage of farmers that reported that they had made each of selected responses is reported in table 5. The distribution of farmers by the number of different responses that they had used is as follows (i.e. 29.5 percent had made none of the responses, 23.7 percent had made one of them, etc.):

<u>Count</u>	<u>Percent</u>	<u>Count</u>	<u>Percent</u>
0	29.5	5	3.8
1	23.7	6	1.2
3	13.5	7	0.3
4	8.5	8	0.3
5	3.8	12	0.3

Table 5. Percentage of Farmers Responding to Financial Stress in Selected Ways

Item	Percent
Postponed machinery or equipment purchase.	55.8
Reduced the amount of fertilizer or agricultural chemicals that you applied per acre.	30.1
Renegotiated a loan agreement or land contract to:	
-reduce the interest rate that you paid.	29.8
-extend the repayment period to give you more time to repay.	17.8
-reduce the amount that you owed.	9.1
Offered land for sale by advertising or listing with a realtor or auctioneer.	9.1
Sold any land.	3.5
Conveyed back to the seller land you were buying on a land contract.	0.6
Conveyed back land to any mortgage holder or lender to apply toward reducing the out-standing debt.	0.3
Renegotiated a rental agreement to reduce the amount of rent that you paid.	8.5
Switched from cash rent to crop share rent on land that you rent in.	4.1
Conveyed back any machinery to the seller or to a lender to apply toward outstanding debt.	1.2

Source: 1987 Wisconsin Family Farm Survey.

Assets, Debt and Net Worth of Continuing Farmers

A farm household's net worth is an important indicator of the financial security and flexibility of the household and its farm operation. For most farm families, the farm is its major investment for the future. Many farmers, who may have accumulated substantial net worth by urban standards, saw their lifetime accumulation of wealth and retirement "savings" decline rapidly during the 1980s.

Net worth of the farm household is calculated as the value of all farm and nonfarm assets minus all farm and household debts. Assets include farmland, farm buildings and equipment, residences, personal savings and investments, and nonfarm real estate. Debts are totalled for all household members and the farm business. As of January 1, 1987, the mean net worth of farmers surveyed was \$207,356 (in 1982 dollars), compared with \$273,754 four years earlier.

For most farmers, land is their major asset. Land values declined sharply in Wisconsin in the early 1980's, from a peak of \$1,152 per acre on January 1, 1981 to \$630 per acre seven years later. Consequently, most farm households observed a decline in the value of their assets. About 80 percent of the southwestern Wisconsin farm households surveyed observed a reduction in their net worth between 1983 and 1987. Most lost less than \$100,000. Likewise, of the households that increased their net worth, most increased it by less than \$100,000.

Household Income of Continuing Farmers

Three-fourths of the farm operators in the 1983 survey continued to operate farms in 1987. Of these 400 continuing farm operators, 342 (85 percent) were re-interviewed.^{10/} Their mean total household income from all sources (in 1982 dollars) did not change significantly between 1982 and 1986. However, net income from farming was less, with off-farm jobs and passive income from nonfarm investments and transfers making up the difference. Differences between 1982 and 1986 are statistically significant for the three major categories but not for total household income.

^{10/} The means for the 15 percent who were nonrespondents in 1987 were compared with respondents for several key variables, using their respective 1983 data. A significant difference was found only for years of formal education, with nonrespondents averaging two years less than respondents. Our conclusion was that the 342 respondents are not different from a random sample of continuing farmers in the study area.

As shown by Figure 2, between 1982 and 1986 the role of off-farm employment as a source of total household income increased from 26 to 33 percent. Net farm income as a percent of total household income decreased from 55 to 43 percent. If home farm wage transfers are included as farm income, then the decrease would have been from 61 to 50 percent.^{11/}

The changes in the level and importance of the sources of income should be of interest to farm decision-makers as well as the broader rural community. To best show these changes, farms were first sorted into three sub-groups based on their gross sales of farm products. We refer to these as small dairy farms (sales less than \$65,000), large dairy farms (gross sales of at least \$65,000), and non-dairy farms.

Total farm household income measures the cash income available to meet family consumption expenditures, to replace farm capital as it wears out, and to make principal payments on debt. Net cash farm operating income includes the sum of gross sales of agricultural products plus net receipts from custom work, gas tax refunds, and miscellaneous farm-related receipts, and subtracts cash farm operating expenses and the original cost of livestock sold. No imputed charge is made for depreciation. Off-farm employment income is primarily wages and salaries, but also includes the net self-employment income from a non-farm business. Transfers include social security and other public retirement benefits, veterans' benefits, private pensions, and welfare program benefits. Nonfarm investment income includes interest, dividends, and rent.

Total farm household income by sources and farm type are reported in table 6. During the four years from 1982 to 1986 the economy experienced a total of 12 percent inflation, measured by the Consumer Price Index (CPI). Comparisons between 1982 and 1986 income in the table are first made with deflated 1986 dollars to reflect constant purchasing power between years. Income in current (1986) dollars is reported in the last column for reference.

Among all 338 farms in the sample, and among the farm families in each subgroup, the mean of total household income in 1982 was not different in a statistically significant way from the mean in 1986. However, among the income sources there were several significant changes in the means between 1982 and 1986. (Some changes that may appear "large" are not statistically significant because there was a wide range about the mean.)

^{11/} "Home Farm Wage Transfers" are payments made to household members (e.g. spouse, children) from the farm business for work done on their own farm. They are included as a farm business expense in calculating net cash farm operating income, but because they are received by a household member they must also be included as income in determining total household income.



Figure 2 Distribution of Household Income by Source, 1982 and 1986 Southwestern Wisconsin

Table 6. Total Farm Household Income by Source and Farm Type, 1982 and 1986, Southwestern Wisconsin

Item	1982 Income	1986 Income	
		Deflated to 1982 Dollars	Current Dollars
All Farms (N = 342)			
Net cash farm operating income	\$15,715 ^a	\$12,058	\$13,503
Off-farm employment income	7,405 ^b	9,109	10,200
Home farm wage transfers	1,800	1,860	2,083
Non-farm transfer and investment income	<u>3,502^c</u>	<u>4,682</u>	<u>5,243</u>
Total farm household income	\$28,421	\$27,710	\$31,029
Small dairy farms (N = 110)			
Net cash farm operating income	\$13,543 ^a	\$10,993	\$12,310
Off-farm employment income	3,851 ^c	6,353	7,114
Home farm wage transfers	1,316	941	1,054
Non-farm transfer and investment income	<u>3,531</u>	<u>4,392</u>	<u>4,919</u>
Total farm household income	\$22,241	\$22,679	\$25,396
Large dairy farms (N = 133)			
Net cash farm operating income	\$24,945 ^b	\$20,031	\$22,431
Off-farm employment income	3,996 ^c	6,935	7,766
Home farm wage transfers	2,850	3,437	3,849
Non-farm transfer and investment income	<u>2,290^a</u>	<u>3,755</u>	<u>4,205</u>
Total farm household income	\$34,082	\$34,158	\$38,250
Non-dairy farms (N = 99)			
Net cash farm operating income	\$ 5,727	\$ 2,531	\$ 2,834
Off-farm employment income	15,933	15,092	16,900
Home farm wage transfers	926	763	855
Non-farm transfer and investment income	<u>5,097</u>	<u>6,249</u>	<u>6,988</u>
Total farm household income	\$27,683	\$24,635	\$27,586

Source: 1983 and 1987 Wisconsin Family Farm Surveys.

Note: Both the 1982 and 1986 income levels pertain to continuing farm households. Small dairy farms are defined as dairy farms with gross value of sales less than \$65,000 in 1982. Large dairy farms are defined as dairy farms with gross value of sales of at least \$65,000 in 1982. Home farm wage transfers are the wages paid to the spouse or other adult family members for farm work. Off-farm employment income includes off-farm wage and self-employment income.

T-tests were conducted comparing the 1982 and deflated 1986 mean values. Significance levels of differences in the 1982 and 1986 means:

- .80 - a
- .90 - b
- .95 - c

Significantly lower means in net cash farm operating income occurred for small dairy farms and to a somewhat lesser significance for larger dairy farms. On average, the larger dairy farms expanded their land base during this period and may have partially offset the less favorable farm income situation by increasing the size of business.

Off-farm employment income was significantly larger in 1986 over 1982 for both groups of dairy farms. Family composition may have changed enough during the four years (i.e. as children grew older and more independent) so that more adult labor could be allocated to farm or off-farm work and from child care. This will be explored further in the following section.

Nonfarm transfer and investment income was significantly higher in 1986 compared with the 1982 means for both the non-dairy farms and the large dairy farms. Higher interest rates on financial accounts, increased values and thus earnings for nonfarm real assets, or shifts of capital from the farm to nonfarm portfolio (e.g. participation in the federal Dairy Herd Termination Program) may be explanations. It is clear, however, that farm family income sources do not stop at the farm gate, and the importance of these sources increased from 1982 to 1986.

While it cannot be seen in table 6, there is a great deal of variation within each source and within total income among the farms in each subgroup. The mean household income for all 338 farms in the sample was \$26,304 but one-fourth received incomes over \$40,000 and one-fifth received less than \$10,000. With such a wide range in incomes, and from such a variety of sources, it is clear that public policies or programs to "help farm families" need to be carefully targeted.

Off-Farm Work of Farm Operators and Spouses

The increase in mean off-farm earned income between 1982 and 1986 for the survey households came about because a larger percentage of farm operators, spouses and other adults worked off the farm; because they worked more hours on average; and because of higher wage rates. As shown in Figure 3, 29 percent of farm operators worked off-farm in 1982. This increased to slightly more than 31 percent in 1986. In terms of farm spouses, the increase was from 38 percent in 1982 to 46 percent in 1986.

Of the 910 adults who were a part of these farm families in 1986, 40 percent were employed off-farm at least part time that year, compared with 34 percent of the 940 adults present four years earlier (see figure 3). Fewer farm operators reported no off-farm employment in 1986 than in 1982, and 45 were working full-time in 1986, a net increase of five compared to 1982.

More spouses reported working off-farm in 1986 than in 1982. Larger numbers of spouses reported working 800 to 1600 hours and full-time in 1986 than four years previously. Other adults in the farm household, such as children at least 16 years old or grandparents, may also work off the farm and contribute earned income to the household. In 1982, there were 300 other adults present on these 338 farm households, and in 1986, there were 273. The change in the number of adults in these households reflects changes in household composition during the four years between surveys. For example,

some young adults have left home and younger children have reached age 16 and have begun to work. The proportion of other adults who reported working off the farm has increased, from 38 percent in 1982 to 46 percent in 1986. About one-fifth of other adults worked off the farm for less than 800 hours in 1982 compared with one-fourth in 1986.

The off-farm employment is an important component of total income for the families, but it is also important to the local communities in which they reside. First, it provides additional income that would otherwise not have been available to be spent for consumer goods, farm inputs, or to retire debt. Second, the increased off-farm employment by farm family members meant a net increase in the number of persons and skills available and utilized by employers, with the potential for contributing to economic growth in the community.

Farm Households With and Without Off-Farm Work

We can further examine the importance of off-farm income to the continuing farm households by partitioning these households into two groups: a) those households that had no household members working off-farm, and b) those where at least one household member worked off-farm.

In Table 7 the distribution of total household income for these two groups for 1982 and 1986 is presented. For those households where there is some off-farm income, the proportion of total income originating from the farm is approximately half that observed for households where there are no off-farm workers. For them, in 1982 and 1986 approximately 35 percent of total household income came from net farm income. For those households with no off-farm income, over 78 percent of household income originated from net farm income in 1982 and 67 percent in 1986.

Occupations of Multiple Job-Holding Farm Household Members

Differences in the observed wage rates can be associated with the level of formal education and indirectly with occupation. In 1986, farm operators with under eight years of formal education earned an average of \$6.95 per hour. Those with 12 years averaged \$8.29. Operators with more than a high school education averaged \$13.06. For the same year, spouses with less than 8 years of education averaged \$3.68 per hour, compared to \$5.83 for those with 12 years of schooling and \$8.15 with post-high school education.

The level of education is one of the determinants of the types of occupation associated with off-farm work. The distribution of off-farm occupations differed among farm operators, spouses, and other adults (see table 9). For farm operators, there was a fairly even distribution among the teaching, agricultural related, construction, production, and transportation occupations. For spouses, the most important occupations were teaching, clerical and service occupations. With relatively low wage rates usually associated with clerical and service occupations, the low average wage rates observed for spouses in table 8 are not surprising.

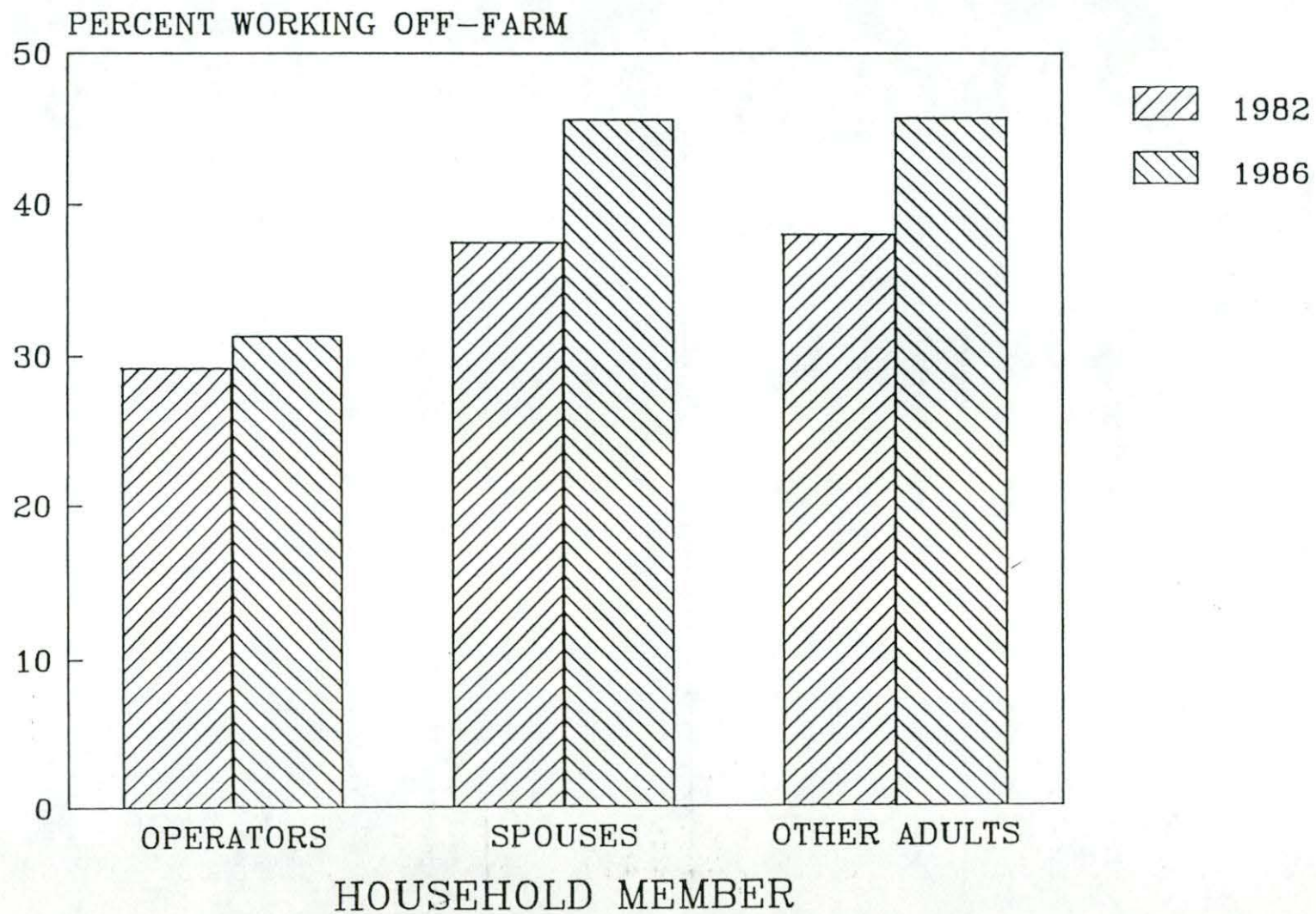


Figure 3 Proportion of Farm Family Members Working Off-Farm, 1982 and 1986 Southwestern Wisconsin

Table 7. Distribution of Total Household Income by Off-Farm Work Status, 1982 and 1986 (1982 dollars)

Source of Income	1982				1986			
	No Off-Farm Work	%	Off-Farm Work	%	No Off-Farm Work	%	Off-Farm Work	%
Net Farm Income	\$21,984	78.5	\$10,758	37.2	\$17,403	66.9	\$9,941	34.8
Home Farm Wages	1,836	6.6	1,772	6.1	2,058	7.9	1,794	6.2
Off-Farm Employ.	---	---	13,434	46.5	---	---	12,988	45.5
Passive Income	4,193	15.0	2,955	10.2	6,557	25.2	3,825	13.4
Total Income	\$28,013	100.0	\$28,920	100.0	\$26,019	100.0	\$28,547	100.0

Source: 1983 and 1987 Wisconsin Family Farm Surveys.

Note: The undeflated 1986 levels of income were \$29,137 and \$31,968 for households which did not have a household member working off-farm vs. those that did.

Hours Employed and Wage Rates

The increased quantity and proportion of total household income that came from off-farm employment in 1986 was noted earlier. This change reflects in part the increased hours that they worked and higher wage rates.

The extent of off-farm labor market participation differs significantly in a number of ways with respect to farm operators and spouses (see table 8). Approximately one-quarter of the farm operators working off-farm in both years were self-employed. This compares with less than 10 percent for farm spouses. In addition the extent of off-farm commitment varied between operators and spouses.

There appears to be a bimodal distribution of the number of farm operators that work off-farm in terms of the number of hours worked. In 1982, 43 percent of off-farm working operators worked less than 800 hours and 43 percent were working full-time (over 1600 hours). In 1986, these proportions increased to 46 and 45 percent respectively. In contrast to this pattern, there is a relatively even distribution between the three hour categories for farm spouses.

Persons with full-time off-farm employment received higher wage rates than part-time workers. Farm operators working less than 800 hours in 1986 averaged \$7.24 per hour, compared to \$13.23 for those working full-time. Spouses working fewer than 800 hours averaged \$5.76, compared with \$8.22 for those working over 1600 hours per year.

Table 8. Distribution of Wages by Hours Worked Off-Farm, 1982 and 1986

Number of Hours Worked	1982						1986					
	Operator			Spouse			Operator			Spouse		
	No.	%	Wage	No.	%	Wage	No.	%	Wage	No.	%	Wage
Wage Work												
1-799	31	42.5	\$7.69	38	36.2	\$5.85	38	46.3	\$7.24	39	29.5	\$5.76
800-1599	11	15.0	11.24	30	28.6	6.89	7	8.5	7.24	44	33.3	7.03
1600 +	31	42.5	10.53	37	35.2	5.94	37	45.2	13.22	49	37.2	7.43
Sub-Total	73	100.0	9.43	105	100.0	6.18	82	100.0	9.94	132	100.0	6.80
None	242	--	--	191	--	--	235	--	--	163	--	--
Self-Employ.	27	--	--	10	--	--	25	--	--	6	--	--
Total	342	--	--	306	--	--	342	--	--	301	--	--

Source: 1983 and 1987 Wisconsin Family Farm Survey.

The last three columns in table 9 present the distribution by occupation of all Wisconsin wage earners from the 1980 Census of Population.^{12/} Comparing the distribution of Wisconsin male wage earners with the 1982 farm operator distributions we see that farm operators tend to be more involved with public administration. Most of these are local officials on a part time basis. In addition there are relatively more farm operators that are teachers and working in agriculturally related occupations when compared to the overall male working population. Given the rural nature of the study region the lower proportion of operators working in production related positions compared to the state as a whole is as might be expected.

Distribution of Hours Worked by Farm Type

The structure of farming as described by farm type, farm size, and farm financial position are also associated with the multiple job-holding of farm household members. These relationships are explored in tables 10, 11, and 12.

^{12/} Of those farm operators who worked off-farm in 1982 only 1 was a female. Of those farm spouses who worked off-farm in 1982, only 1 was a male.

Table 9. Comparison of Occupation for Continuing Farm Families and All Wisconsin Wage Earners

Occupation	Continuing Farmers 1982				Continuing Farmers 1986				Wisconsin Wage Earners		
	Operator	Spouse	Other	Total	Operator	Spouse	Other	Total	Male	Female	Total
Public Administration	9.6	1.0	---	1.5	6.1	----	----	2.1	.4	.2	.3
Other Administration	4.1	3.8	1.0	2.8	6.1	4.5	2.5	5.1	10.4	5.2	8.1
Teachers	13.7	15.2	2.9	10.2	11.0	14.4	2.5	13.1	3.2	6.9	4.8
Health Related	----	10.5	1.0	4.2	----	8.3	1.7	5.1	1.4	9.5	4.9
Sales Occupations	2.7	2.9	6.7	4.2	3.7	8.3	15.8	6.5	6.6	9.9	8.0
Clerical	6.8	26.7	10.5	15.5	6.1	28.8	5.8	20.1	5.7	28.1	15.3
Service Occupations	1.4	20.0	26.7	17.7	2.4	21.2	18.3	14.0	8.7	15.4	11.5
Agricultural Related	11.0	----	23.8	11.7	7.3	.8	10.8	3.3	2.8	1.4	2.2
Const. & Mechanics	12.3	----	3.8	4.6	13.5	----	6.7	5.1	17.8	2.1	11.0
Production Related	13.7	8.6	9.5	10.2	18.3	9.8	22.5	13.1	26.2	13.0	20.5
Transportation	15.1	2.9	3.8	6.4	23.2	2.3	3.3	10.3	6.8	.8	4.2
Other Occupations	9.6	8.6	10.5	9.5	2.4	1.5	10.0	1.9	10.0	7.5	9.2

Source: Continuing Farmer - 1983 and 1987 Wisconsin Family Farm Survey.
 Wisconsin Wage Earners - 1980 Census of Population.

Note: These occupations are for wage and salary workers only. Self-employed persons are not included.

Table 10. Mean Hours Worked On and Off-Farm by Off-Farm Work Status and Farm Type, Operators and Spouses, 1986

Farm Type	Operator		Spouse	
	Worked Off-Farm	No Off-Farm Work	Worked Off-Farm	No Off-Farm Work
Dairy				
Farm Hours	3284 ^a	3882	863 ^a	1529
Off-Farm Hours	758	----	1146	----
Total	4042	3882	2009 ^a	1529
No. of Obs.	39	199	84	129
Cash Grain				
Farm Hours	1061 ^a	2312	302	113
Off-Farm Hours	1564	----	1336	----
Total	2625	2312	1638 ^a	113
No. of Obs.	13	17	13	11
Other Farm Types				
Farm Hours	1437 ^b	2054	301 ^b	750
Off-Farm Hours	1555	----	1356	----
Total	2992 ^a	2054	1657 ^a	750
No. of Obs.	30	44	35	29
All Farms				
Farm Hours	2256 ^a	3470	658 ^a	1303
Off-Farm Hours	1177	----	1221	----
Total	3433	3470	1879 ^a	1303
No. of Obs.	82	260	132	169

Source: 1987 Wisconsin Family Farm Survey.

Note: The subscripts refer to the results of T-Tests of the mean farm hours worked for those operators and spouses who worked off-farm vs. those who did not. The superscript "a" refers to significance at the .01 level and "b" to the .05 level. T-test of differences in off-farm hours across farm types were conducted and it was found that dairy farm operators who worked off-farm had significantly less off-farm hours vs. non-dairy operators.

Table 11. Mean Hours Worked On and Off-Farm by Off-Farm Work Status and Farm Size, Operators and Spouses, 1986

Farm Size	Operator		Spouse	
	Worked Off-Farm	No Off-Farm Work	Worked Off-Farm	No Off-Farm Work
1-100 Acres				
Farm Hours	1296 ^b	2175	303 ^b	831
Off-Farm Hours	1758	----	1255	----
Total	3054 ^a	2175	1558 ^a	831
No. of Obs.	18	30	24	21
101-250 Acres				
Farm Hours	2265 ^a	3184	771	810
Off-Farm Hours	1103	----	1336	----
Total	3368	3184	2107 ^a	810
No. of Obs.	37	78	49	66
251-400 Acres				
Farm Hours	2767 ^a	3757	718 ^b	1164
Off-Farm Hours	824	----	1264	----
Total	3591	3757	1982 ^a	1164
No. of Obs.	13	80	29	64
401+ Acres				
Farm Hours	2992 ^a	3999	702 ^b	1353
Off-Farm Hours	956	----	962	----
Total	3948	3999	1664	1353
No. of Obs.	14	72	30	56

Source: 1987 Wisconsin Family Farm Survey.

Note: The subscripts refer to the results of T-Tests of the mean farm hours worked for those operators and spouses who worked off-farm vs. those who did not. The superscript "a" refers to significance at the .01 level and "b" to the .05 level. T-test of differences in off-farm hours across farm size categories were conducted and it was found that farm operators who worked off-farm and operated less than 100 acres had significantly more off-farm hours vs. other operators who worked off-farm.

Table 12. Mean Hours Worked On and Off-Farm by Off-Farm Work Status and Financial Condition, Operators and Spouses, 1986

Debt-Asset Ratio	Operator		Spouse	
	Worked Off-Farm	No Off-Farm Work	Worked Off-Farm	No Off-Farm Work
No Debt				
Farm Hours	1583 ^a	2838	197 ^a	938
Off-Farm Hours	1217	----	1164	----
Total	2800	2838	1361	938
No. of Obs.	19	75	20	55
0 < D/A ≤ .40				
Farm Hours	2264 ^a	3732	625 ^a	1508
Off-Farm Hours	1277	----	1282	----
Total	3541	3732	1907	1508
No. of Obs.	41	120	71	74
.40 < D/A ≤ .70				
Farm Hours	2905	3456	899	1319
Off-Farm Hours	730	----	970	----
Total	3635	3456	1869	1319
No. of Obs.	10	37	23	21
D/A > .70				
Farm Hours	2754 ^a	4054	997	1544
Off-Farm Hours	1147	----	1363	----
Total	3901	4054	2360	1544
No. of Obs.	12	28	18	19

Source: 1987 Wisconsin Family Farm Survey.

Note: The subscripts refer to the results of T-Tests of the mean farm hours worked for those operators and spouses who worked off-farm vs. those who did not. The superscript "a" refers to significance at the .01 level and "b" to the .05 level. "D/A" refers to the debt-to-asset

In table 10, the 342 continuing farm operators are partitioned according to farm type. Seventy percent of these farms were categorized as primarily dairy farms, 9 percent as cash grain farms and 11 percent as other farm types. Given the time commitments associated with maintaining a dairy herd, it was not surprising that relatively fewer dairy farm operators and spouses worked off-farm. About 16 percent of dairy farm operators and 39 percent of their spouses worked off-farm. This compares with 41 and 55 percent for operators and spouses of non-dairy farms. In addition, dairy farm operators and spouses on average worked fewer hours off-farm.

For all operators that worked off-farm, the number of hours worked off-farm (1177 hours) was approximately the same as the number of hours worked by spouses (1221 hours), while such operators worked more than three times the hours in farm related activities as those spouses.

Farm operators and farm spouses who did not work off-farm worked significantly more hours on the farm than those who combined farm and off-farm work. However, farm operators worked essentially the same average total hours whether they worked off-farm or not (3433 hours versus 3470 hours). Spouses who combined farm with off-farm worked averaged more total hours, 1879 hours compared with 1303 hours for spouses who did not.

Distribution of Hours Worked by Farm Size

In Table 11, the surveyed farms are partitioned according to size measured by the number of operated acres. Fourteen percent of the farms had less than 100 acres, 34 percent operated between 100 and 250 acres, 27 percent operated between 250 and 400 acres, and 25 percent had more than 400 acres.

The proportion of farm operators who worked off-farm decreased from 38 percent of the operators of the smallest farm to 16 percent for the largest farms. Regardless of farm size, farm operators who worked off-farm worked fewer farm hours when compared to operators who did not work off-farm. It was also found that the larger the farm size, the greater the number of farm hours worked by the operator regardless of their off-farm work status. In addition, there is a general pattern of fewer off-farm work hours the larger the farm size.

Surprisingly, there was no significant difference in total work hours of farm operators by size of farm, except for the operators of the smallest farms. This implies that, for the larger sized farms, there is an allocation of a fixed work time budget between off-farm and farm related work time.

The relationship between farm size and hours worked off-farm by the spouse was not as clear cut as for the farm operators. For those that worked off-farm, the mean on-farm hours remained relatively constant except for the smallest farm group. For spouses that did not work off-farm there was a general increase in the number of hours worked on-farm from 831 hours for the smallest sized farms to over 1353 hours in the largest category. In contrast to the trend observed for farm operators, except for the largest sized farms, the total work time (farm plus off-farm) of spouses working off-farm was greater than those spouses that did not work off-farm.

Distribution of Hours Worked by Financial Status

In this perspective on farm structure, financial status is measured as the ratio of total debt to total value of assets. As shown in Table 12, three-quarters of the operators had debt-to-asset ratios of less than .40.

There were 94 survey farmers with no debt, which was 27 percent of all the farmers. Their mean age was 62 years, significantly older than the 47 years of the rest of the farmers. Their spouses on average were 58 years old, compared with 44 years for the remainder. This age difference, as well as financial status, probably affected the percentage of these older persons who worked off-farm. The incidence of off-farm work was 20 percent of the operators (versus 25 percent for the remainder) and 27 percent of the spouses (versus 50 percent). However, for those who did work off-farm, the hours worked were little different from the younger persons.

In terms of the relationship of hours worked off-farm to the-debt-to-asset ratio, no pattern among the farm operators or the spouses is revealed in the table. In addition, the total hours worked (on-farm plus off-farm) by part-time farmers was not different from the full-time farm operators within each debt-to-asset group.

Years of Education and Nonfarm Wage Rates

The off-farm wages of operators and spouses depended heavily on how much formal education they had. Farm operators with under eight years of formal education earned an average of \$6.45 per hour. Those with 12 or more years averaged \$13.21. Average off-farm wage for all farmers was \$10.09. Spouses with less than 8 years of education averaged \$3.68 per hour, compared to \$8.72 for those with 12 or more years of schooling. Average wage for spouses was \$7.04.

Persons with full-time off-farm jobs earned the highest wages. Farm operators working less than 800 hours per year averaged \$7.24, compared to \$13.23 for those working full-time (over 1600 hours). Spouses working fewer than 800 hours averaged \$5.76, compared with \$8.22 for those working over 1600 hours per year.

Farm Spouse Entry and Exit and the Off-Farm Labor Market

Off-farm work of farm spouses has become more common in recent years, in a manner similar to female spouse taking employment out of the home among the nonfarm population. Prior analyses of farm spouses have assumed the movement was symmetrical, i.e. the variables that explained entry also explained exit from the off-farm labor market. Because we had longitudinal data we could develop an analysis that moved beyond that assumption. For the continuing farmer households with constant marital status between 1982 and 1986 we classified female spouses for analysis in four groups as follows: a) did not work off-farm either year, b) worked off-farm both years, c) worked off-farm in 1982 but not in 1986 (exit from the off-farm labor market), and d) did not work off-farm in 1982 but did in 1986 (entered the off-farm labor market).

The analyses of the exit and entry groups of spouses documented labor market behavior by female farm spouses that was consistent with expectations, and supported the notion of state dependence of their labor supply decisions. The higher the wage offer in 1982 and the greater the increase in offer by 1986, the greater the probability of entry and the lesser the probability of exit. In addition, the higher the income per person in the household in 1982 and the greater the increase, the greater the probability of entry. Thus, these rural labor markets worked as expected and potential employees were sensitive to market signals.

Investments in human capital yielded positive, measurable results, a point of interest to both individuals and public sector decision makers. Years of formal education were positively associated with both the probability of off-farm work and with the wage rate received. Change in years of formal education between the two survey years was uncommon among the sample farm wives and its impact was not tested. Having received vocational training increased the probability of having off-farm work in both 1982 and 1986, and it overcame the disadvantage of increasing age in entry into off-farm work for persons age 38 and older.

Individuals and the managers of employment training and placement programs should note the importance of getting started at some place in the off-farm labor market so that a work record and experience can be gained. The number of past years in which these farm wives had worked off-farm was positively associated with wage rate and the probability of reentering the labor force, and negatively associated with the probability of exit.

Experiencing the birth of a child between 1982 and 1986 reduced the probability of entry into off-farm work by 23 percentage points and increased the probability of exit by 11 percentage points. It is reasonable that the affected spouses were allocating time to home production rather than off-farm work. If their off-farm work is important to their employers and the communities in which they live and spend their income, then this suggests an opportunity for the provision of these child care services by interested employers, community organizations, or private entrepreneurs.

Finally, while the unemployment rate for females in each farm wife's commuting range had no measurable effect on the probability of off-farm work, it did have a dampening effect on the wage rates received.

Gould and Saupe examined the lack of symmetry in the reasons why female farm spouses entered and the reasons they exited the off-farm labor market. They formulated a series of models based on the Heckman's sample selection model of labor supply to examine the dynamics of labor force participation, using the 1983 and 1987 Wisconsin Family Farm Surveys. They first estimated the probability of a farm spouse working off the farm, finding such participation positively associated with years of formal education and the subject having received nonfarm vocational training within the last four years. Participation was negatively associated with the level of farm income, the presence of children under six years of age, and the unemployment rate in the county of residence. Residing on a dairy farm was negatively related to the probability of off-farm work, unless the farmer was a relatively recent entrant, in which case it was positive.

The off-farm wage rate was next estimated for all spouses, regardless of their off-farm work status, and was found to be positively associated with years of formal education, previous off-farm work experience, and presence of small children in the home, and negatively with the unemployment rate in the county of residence. Age displayed an increasing and then decreasing relationship with wage rate.

The probability of entry into the off-farm labor market by 1986 for a spouse that was not so employed in 1982 was positively associated with estimated wage rate, the increase in estimated wage rate since 1982, years of previous off-farm work experience, and recent participation in nonfarm job training (if over 38 years of age). Probability of entry was negatively associated with the recent birth of a child, per capita family income, and being relatively recent farm entrants.

The probability that a farm spouse who had been working off-farm in 1982 was not in 1986 was positively related to having worked relatively few hours in 1982, giving birth to a child since 1982, and being older. It was negatively related to level of off-farm wage, increase in off-farm wage between 1982 and 1986, and the number of continuous years of off-farm employment.

The Gould and Saupe results support the notion of state dependence of farm spouses' off-farm labor supply. That is, not only is it important for policy makers to understand future values of those variables likely to affect off-farm work activity, but also it is important to understand the implications of previous levels of income, labor market experience, and wages on the exit and entry process. From the probit models of exit and entry, wage and income elasticities were calculated for both the exit and entry process. In terms of entering the off-farm wage market, an elastic own wage elasticity of 1.3 was found. In contrast, the exit wage elasticity was negative and less than unity (e.g. -.71).

Farm Poverty in Southwestern Wisconsin

The concept of "poverty" involves being limited to an "unacceptable" level of consumption. In the extreme, an "unacceptable level" is an inadequate level of consumption and malnutrition, ill health, or starvation result. What is "unacceptable" is determined by the society in which the disadvantaged persons live, and in a wealthy country such as the USA the level will be different from that in a less wealthy country.

Federal criteria for the level of income that would provide the minimally acceptable level of consumption were first developed in the late 1960s. They represent the level of income, for families of different compositions, that will provide the minimum acceptable level of consumption that our society is willing to have its members accept. They are referred to as poverty thresholds or poverty lines. Based on a nutritionally adequate but sparse diet, the cost of purchasing the basket of food for that diet is determined. Early studies showed that poor people spent one-third of their income on food, so the cost of the food basket is multiplied by three to account for housing costs, clothing, and all other consumption items.

Poverty thresholds are calculated for families of all sizes, and composition, e.g. adults with small children vs. adults with older children, etc. They are adjusted each year for the change in the cost of living. They can be used to compare families of different sizes and to make comparisons between years.

At the time of our survey, the poverty threshold for a family of four was about \$12,600 per year, or about \$.97 per person per meal, plus about \$5.80 per day for all other living expenses. Poverty rates in the nation in 1987 were 12.6 percent among farmers, 12.8 for persons living in metropolitan areas, 16.9 for persons in nonmetro areas, and 18.8 percent in the central city.

From the 1986 survey data, the poverty threshold income was calculated for each household. Comparing observed household income with the poverty income levels it was found that in 1986 16 percent of the continuing farm households were at or below the poverty level. Ten percent of the households had total household income levels that were above the poverty level by 50 percent or less. The remainder of the survey households had income levels greater than 150 percent of the poverty level of income.

RESEARCH IN PROGRESS

Farm Cost of Producing Milk

One hypothesis to be tested using data from the 1983 and 1987 Family Farm Surveys is that the farm cost of producing milk in southwestern Wisconsin was lower in 1986 than in 1982. This analysis is currently in process.

This analysis is included because dairy farmers have experienced three periods of difficult financial conditions during the decade of the 1980s. Early in the decade farm financial stress was a national concern, and was most apparent in a halving of farm real estate values and associated declines in farm equity and the ability to support farm credit. In mid-decade federal farm policies were revised to levels less costly to the taxpayer and less favorable to farm producers, responding to the perception of relatively large federal farm program budgets in an era of deep concern about federal deficits. This resulted in scheduled reductions in the federal price supports for dairy products, and thus the prices received by dairy farmers. Finally, the widespread drought conditions of 1988 reduced crop yields and adversely affected farm costs and income for that year and for some time following.

Particularly in such periods of financial difficulty, the relationship between the farm cost of producing milk and the prices received by farmers is of both public and private sector concern. The public sector concern arises because the price received by farmers for their milk has been determined most of the time in recent decades by federal farm programs. By purchasing and removing from the market quantities of cheddar cheese, dry milk, and butter at preset prices, the federal government has been able to establish and support the minimum farm price for milk. Because the price received is determined by the government, there is concern that the price is in some sense "fair" to milk producers, the producers of other farm commodities, and to the taxpayers.

Private sector concern lies with the individuals and institutions that supply credit to dairy farmers and are thus directly affected by their economic well-being, the processors of milk that have been receiving a government guaranteed price for their product and that prefer that their plants continue to operate at full rather than partial capacity, farmer organizations charged with representing farmers' interests, and the farm families themselves.

In this analysis we will determine the farm costs of producing milk for a random sample of dairy farms in southwestern Wisconsin. Dairy farms in that area generally produce most of the crops that are used as feed for their dairy animals, and sell surplus feed and livestock in addition to their major product, milk. Thus, the first methodological issue to be dealt with is the appropriate way to convert the many products of the agricultural process on these farms into some measure of milk equivalent. Second, we will address the conceptual and methodological issues in measuring the costs of production, dealing with the matters of cash costs, within farm family labor transfer payments, and the imputed and opportunity costs of farm resource use. Finally, having calculated the costs of production for each of our sample

farmers, we will identify the characteristics associated with the observed differences in costs. From this we will draw conclusions regarding the likelihood of a farm's continuation in dairying under adverse financial circumstances and the implications a) for the future structure of the dairy farming industry, b) for federal dairy policy, and c) for farm business and financial management decisions made by farm operators and their lenders.

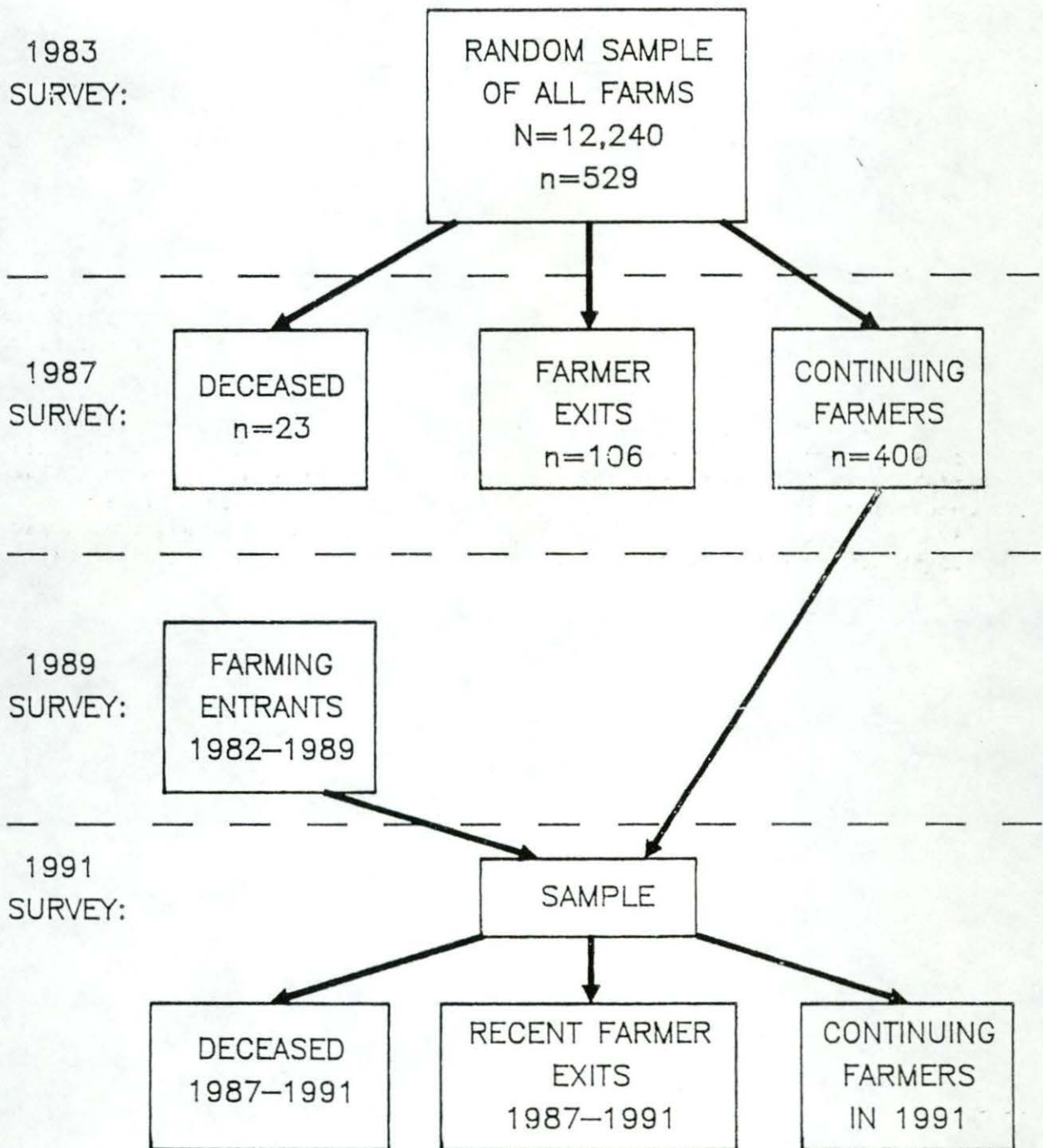
Recent Farm Entrants in Southwestern Wisconsin

The 1987 Family Farm Survey in southwestern Wisconsin that was made possible by this grant was the second wave in an intensive longitudinal survey of farm families in an important agricultural area. The analyses of farm exits since the first survey four years earlier and of the continuing farmers provide new information not otherwise available about these segments of the farm population.

A third wave will fill a current gap in information describing the population, i.e. description and analyses of persons that have entered farming in the study area since the first survey in 1982 (see figure 4). Identification of the population of such recent entrants in the study area will take place during summer and early fall of 1989, and on-farm interviews with them (or a sample of them) will take place early in 1990.

Information about the financial and demographic characteristics of recent entrants and about the entry process itself will be useful in its own right. It is also needed for a proposed fourth wave survey in 1991 that would include those recent entrants and the 400 continuing farmers from the 1987 survey. That survey would again be generalizable to all farmers in the eight county study area, and have relevance for many other similar areas.

SOUTHWESTERN WISCONSIN LONGITUDINAL FAMILY FARM SURVEYS



PRESENTATIONS BASED ON THE FINDINGS

In 1987 the principal investigator gave reports about the methodology and management of the follow-up survey at the annual meetings of the American Agricultural Economics Association (at Michigan State University), and at the Southern Regional Science Association (in Atlanta).

A seminar about the survey methodology and preliminary findings was also presented at the Economic Research Service, U.S. Department of Agriculture (Washington, D.C.).

Two invited papers based on the survey data were prepared for delivery in May 1988 at a) the Triennial Meetings of the North Central Region Extension Farm Management Specialists (at Iowa State University), and b) at a national symposium on multiple job-holding by farm families (in Arlington, Virginia).

William Saupe prepared a report with Susan Bentley and participated in a symposium on "Farm Loss in Five States: Causes and Consequences" at the annual meetings of the Rural Sociological Society in Athens, GA August 18 - 23, 1988. An analysis and description of selected characteristics of farm exits entitled "Farm Exit in Southwestern Wisconsin From 1982 to 1987" was presented.

Three seminars about the follow-up survey and the preliminary results were presented in the Department of Agricultural Economics, University of Wisconsin-Madison.

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- Gould, Brian, William Saupe and Richard M. Klemme. "The Importance of Farm and Operator Characteristics in the Adoption and Use of Conservation Tillage in Southwestern Wisconsin." Land Economics; Vol. 65, No. 2. May 1989. (pp. 167-182).
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- Gould, Brian W. and William E. Saupe. "An Analysis of Off-Farm Labor Market Entry and Exit." American Journal of Agricultural Economics. Accepted for fall 1989.
- Bentley, Susan and William Saupe. "Involuntary Farm Exit in Wisconsin." Choices. Accepted for fall 1989.
- Gould, Brian and William E. Saupe. "Changes in the Distribution of Income and Well-Being of Farm Households: Evidence From Wisconsin Panel Data." North Central Journal of Agricultural Economics. Accepted for January 1990.
- Saupe, William and Brian Gould. "Multiple Job Holding Among Farm Families: Results From the Wisconsin Family Farm Surveys." Chapter 10 in Hallberg, ed. Multiple Job Holding Families. Iowa State University Press. Accepted. Forthcoming 1990.

APPENDICES

Appendix A. Test for Differences in Mean Characteristics of Respondents and Non-Respondents

From the following analyses it was determined that respondents' data adequately reflected population characteristics in the study area (see text).

Appendix Table 1. Mean Characteristics of Farm Exit Respondents and Non-Respondents

Variable	Respondent			Non-Respondent			t-value
	Mean	St. Dev.	n	Mean	St. Dev.	n	
Gross Sales	33567	35766	92	24169	23915	14	-0.95
Net Income	6825	20647	92	3114	16536	14	-0.64
Total Income	21491	22567	92	13300	16116	14	-1.31
Total Assets	110133	105958	92	83865	55915	14	-0.91
Total Debt	51587	90114	92	66069	96682	14	0.55
Net Worth	58546	102539	92	17796	115736	14	-1.36
Age	54.2	13.24	92	49.3	15.58	14	-1.26
Education	10.9	2.79	92	10.2	1.88	14	-0.95
Crop Acres	103.1	94.9	92	93.6	93.3	14	-0.35

Appendix Table 2. Mean Characteristics of Continuing Farmer Respondents and Non-Respondents

Variable	Respondent			Non-Respondent			t-value
	Mean	St. Dev.	n	Mean	St. Dev.	n	
Gross Sales	69470	121544	58	64729	63907	342	-0.45
Net Income	17722	18651	58	15938	24468	342	-0.53
Total Income	27370	22680	58	28644	25332	342	0.36
Total Assets	143820	188621	58	142480	107319	342	-0.08
Total Debt	68956	140506	58	83724	111394	342	0.90
Net Worth	74864	106765	58	58756	119045	342	-0.97
Age	46.6	13.5	58	47.2	12.4	342	0.32
Education	10.7	2.14	58	11.6	2.46	342	2.69
Crop Acres	169.4	220	58	168.5	152.3	342	-0.04

Appendix Table 3. Mean Characteristics of
All Respondents and Non-Respondents

Variable	Respondent			Non-Respondent			t-value
	Mean	St. Dev.	n	Mean	St. Dev.	n	
Gross Sales	58123	60398	434	60662	110864	72	-0.29
Net Income	14007	23979	434	14882	19059	72	-0.29
Total Income	27128	24919	434	24634	22181	72	0.80
Total Assets	135623	107727	434	132162	172354	72	0.23
Total Debt	76912	107944	434	68395	132522	72	0.60
Net Worth	58712	115631	434	62768	110096	72	-0.28
Age	48.7	12.9	434	47.1	13.89	72	0.93
Education	11.5	2.55	434	10.6	2.1	72	2.76
Crop Acres	154.6	144.52	434	154.7	203.39	72	0.00

Appendix B. Estimation of Farm Land Values

Internally consistent land values between years were estimated as described in the text. In the following, the regression variables are first defined in words, followed by the results of the regression analysis in appendix table 4.

ACRESSQ	Total acres squared.
DAIRY	Number of dairy cows.
EXPAND	Dummy variable controlling for the effect of expansion plans on land value. Farms with plans to expand through the purchase or rental of land are assigned a value of 1, a value of 0 is otherwise assigned.
LOGPER	Dependant variable used in the regression equation. Calculates logarithm of per acre land value.
NONCTL	Value of non-cattle sales including breeding heifers, calves, feeder steers, mature bulls, hogs and pigs, poultry and eggs, sheep, horses, goats, etc.
PASTURE	Percentage of owned acres including woodlands used exclusively as pasture.
SPLCROPS	Percentage of owned acres in production of specialty crops such as vegetables, tobacco, fruit, nuts or berries, etc.
STEEPDM	Dummy variable controlling for the relative steepness of cropland. If the majority of cropland is characterized by the operator as steep hillside a value of 1 is assigned, a value of 0 is otherwise assigned.
TFNCFINC	Total farm net cash farm income. Cash income of total farm including sales and income from custom work less total farm expenses.
TIME	Dummy variable controlling for time. A value of 1 is assigned for 1982, a value of 0 is assigned for 1986.
TNCFINC, TEXPAND, TTOTAC, TACSQ, and TDAIRY	represent the product of the variable TIME multiplied by the variables NCFINC, EXPAND, TOTACRES, ACRESSQ, and DAIRY respectively.
TOTACRES	Total acres owned by the operator.
URBNCNTY	Dummy variable controlling for proximity to urban areas. Farms located in La Crosse and Monroe counties are assigned a value of 1, all others are assigned a value of 0.
WOODSNP	Percentage of owned acres in woods not pastured.

Appendix Table 4. Estimated Land
Value Regression, Combined Data for 1982 and 1986

Variable	Coefficient	T-Statistic
CONSTANT	6.954873	
ACRESSQ	1.32989E-06	6.239
DAIRY	.007103	7.345
EXPAND	.107057	2.062
NONCTL	5.52506E-06	6.204
PASTURE	-.476386	-5.752
SPLCROPS	3.392705	7.113
STEEPDM	-.234685	-3.026
TACSQ	1.09138E-06	2.631
TDAIRY	-.007882	-4.190
TEXPAND	-.132792	-1.814
TFNCFINC	1.83872E-06	1.677
TIME	.498717	5.658
TNCFINC	-4.21825E-06	-2.509
TOTACRES	-.002744	-9.989
TTOTAC	-9.67640E-04	-2.154
WOODSNP	-.538181	-5.877
Dependent Variable	LOGPER	
Adjusted R Square	.54503	
F Statistic	32.71064	
Degrees of Freedom	17, 433	

Appendix C. Reasons Given by Respondents for Leaving Farming

Farm exits were asked both open-ended questions and scaled questions about the important reasons for their leaving farming (see text). The incidence of their identifying selected factors is reported in this appendix table.

Appendix Table 5. Alternative Measures of Reasons for Farm Exit by Voluntary and Involuntary Farm Exits, Southwestern Wisconsin, 1987

Item	Unit	Voluntary Exits			Involuntary Exits		
		a/	b/	c/	a/	b/	c/
Number of sample farms	Farms	47	57	57	34	34	34
Measurement Criteria		a/	b/	c/	a/	b/	c/
Reasons for exit rated "important":							
Operator's age	Percent	42.9	43.9	49.2	0	0	17.6
Operator's health	Percent	26.8	35.1	45.6	14.7	20.6	14.7
Age or health of another family member	Percent	1.8	1.8	17.5	0	0	5.9
Low income from farming	Percent	1.8	5.3	15.8	38.2	52.9	94.1
Repayment of debt	Percent	0	0	1.8	8.8	8.8	61.8
Possibility of foreclosure	Percent	0	0	0	11.8	20.6	47.1
Availability of off-farm employment	Percent	1.8	12.3	19.3	0	2.9	50.0
Family stress related to farming	Percent	0	1.8	14.0	0	2.9	50.0

Source: 1983 and 1987 Wisconsin Family Farm Surveys.

- a/ Respondent gave this as first reason in the open ended question.
 b/ Respondent gave this as a reason in the open ended question.
 c/ Respondent rates this "important" in the scaled question.