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MULTIPLE JOB HOLDING AMONG FARM FAMILIES: RESULTS FROM THE WISCONSIN FAMILY FARM SURVEYS

By

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In this report we will first comment on the complementarity among national descriptive studies, the modelling of farm household decisions, and regional studies of multiple job-holding among farm households. We will then describe the long-term collaborative research program among USDA and land grant scientists that included the Wisconsin Family Farm Surveys of 1983 and 1987. Finally, we will present some descriptive and analytical results from those two surveys.

I. Introduction

Regional surveys, such as the Wisconsin Family Farm Surveys, can be used a) to complement national descriptive studies, b) to facilitate modelling and testing hypotheses, and c) to document economic and social conditions for local users.

In the first session of this Symposium national vantage points were used to develop the historical perspective and to consider future prospects for multiple job-holding among farm families, in the USA and Canada. National data were also used to describe farm enterprise adjustments made in response to multiple job-holding. Regional studies cannot provide such a national data base or a national overview. However, because the research resources are concentrated in a relatively small geographic area, regional surveys may be able to obtain data more detailed and specific to regional issues than national surveys. Regional surveys may thus be valuable for analyses that augment the detail in national studies, or that provide regional support or contrast to national results.

In the second session of this Symposium the theoretical bases of multiple job-holding and the effects of off-farm work on farm efficiency were explored. Providing the specific data needed for testing such analytical models or hypotheses is a second use of regional studies. In a regional survey, precisely defined data can be collected for use in multivariate analyses that test hypotheses about off-farm labor allocations, e.g. explaining the probability of off-farm work, the hours worked off farm, the wage rates received, or the simultaneous nature of off-farm work decisions by farm operators and spouses. The units of observation can be households or individuals instead of (say) counties, and the use of proxy variables can be reduced compared to using secondary data.

1/William Saupe is a Professor and Brian Gould is an Assistant Research Scientist, Department of Agricultural Economics, University of Wisconsin-Madison. In addition to institutional support from the University of Wisconsin-Madison and the University of Wisconsin-Madison/Extension, this study was funded in part by the Economic Research Service, U.S. Department of Agriculture and the Ford Foundation through the Aspen Institute for Humanistic Studies. Any errors are the responsibility of the authors.

Third, regional studies are useful for describing economic and social conditions in the limited geographical area from which the samples were drawn, and perhaps for other similar areas. The data serve as benchmarks for public policy makers, program managers, extension faculty, those involved with community economic development, and others concerned with the topics covered and the geographical area. For such users, multivariate analyses may help substantiate the cross-tabulations and other descriptive statistics often used with lay audiences.

1.1 Genesis of the Wisconsin Family Farm Surveys

An example of the usefulness of regional surveys in analysis of off-farm labor force participation can be found in the 1983 and 1987 Wisconsin Family Farm Surveys. These surveys are recent products of a decade of collaboration in a research program among scientists in the Economic Research Service, U.S. Department of Agriculture (ERS,USDA) and agricultural economists at the University of Wisconsin-Madison.[2/]

The relevance of this research program was enhanced because it began with two studies to determine what information was needed about farm families to facilitate efficient public policies and programs regarding farm family well-being. Finding major gaps in the existing data series, the research program initiated primary data collection by developing a questionnaire that would fill those gaps. After field testing and revision, the instrument was first used in 1980 with case studies of 169 farm households that were participants in a Cooperative Extension Service program for low equity, recent farm entrants in central and western Wisconsin. In effect a large scale pretest, this study facilitated further revision and clarification in the questionnaire.

The empirical findings of that first study were also useful in Wisconsin as they showed that, contrary to conventional thinking, dairy farm families could be involved in multiple job-holding without causing the demise of the dairy enterprise. The findings also showed that in the midst of an American agricultural boom these farmers on average had annual financial obligations for family living, principal payments, and capital replacement that exceeded their income from all sources by about $15,000; that the prices of farm land and dairy cattle had been bid to levels well above that justified by their income generating ability; and that farmers who entered farming by renting land (instead of the traditional procedure of buying a farm) fared better financially than those buying land (1).

The ERS,USDA then used the questionnaire in a 1981 study of a random sample of 1069 farm households in 29 counties in northern Mississippi and southwestern Tennessee. Several descriptive studies pertaining to multiple job-holding were made by Salant (2,3,4), and Hoover and Crecink (5) based on this 1981 survey. Following the approach suggested by Huffman (6,7,8), Bollman (9), and Sumner (10), Streeter (11) also used these data to develop an agricultural production function to obtain the on-farm labor returns to

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[2/]ERS, USDA support and collaboration has been with Thomas Carlin, Kenneth Deavers, Priscilla Salant, and Susan Bentley.

each farm operator, which was then included among the explanatory variables in estimating a labor supply function for their hours of off-farm work. The nonpecuniary considerations in the labor allocation of farm operators was also examined by Streeter and Saupe (12) using the Mississippi and Tennessee farm survey data.

II. The 1983 and 1987 Wisconsin Family Farm Surveys

Given the development and use of the surveys in the Mississippi and Tennessee environment, the questionnaire was then applied to the southwestern region of Wisconsin.[3/] The 1983 Family Farm Survey in western and southwestern Wisconsin provided data from a random sample of 529 farm families for several descriptive and analytical studies. The data were for calendar year 1982, with asset, debt, and net worth information as of January 1, 1983. The data were used to examine off-farm employment (13,14,15), linkages between farm households and community economic development (16), and the financial viability of family farms (17,18,19,20). Information was also obtained describing the health status of farm families (21), the use of soil conserving practices (22), farmers' business plans for the future, farm families in poverty, and other farm household and business characteristics (23,24).

The survey year 1982 marked the last of the "good economic times" for Wisconsin farmers, and unexpected financial reversals began emerging shortly thereafter. While there was a great deal of anecdotal information about what happened to farm families since 1982, it seemed important that we build on our in-depth 1982 data base to document those changes.[4/] In early 1987 the identical 529 farm operators that had been surveyed four years earlier were contacted and interviewed when possible. Based on their status early in 1987, the operators were sorted into three groups, i.e. those that: (a) had died since the 1983 survey (n=23), (b) had left farming since the survey (n=104), or (c) continued to be farm operators in 1987 (n=402), as shown in Figure 1.

[3/] The eight counties included in the study were Buffalo, Crawford, Jackson, LaCrosse, Monroe, Richland, Trempealeau and Vernon.

[4/] Financial support for conducting both Wisconsin Family Farm Surveys was received from the Economic Research Service of the U.S. Department of Agriculture and the Research Division of the College of Agricultural and Life Sciences in the University of Wisconsin-Madison. In addition, salary support was received from the Cooperative Extension Service and the College of Agricultural and Life Sciences, University of Wisconsin-Madison. The Ford Foundation, through the Aspen Institute for Humanistic Studies, also supported the 1987 follow-up survey.

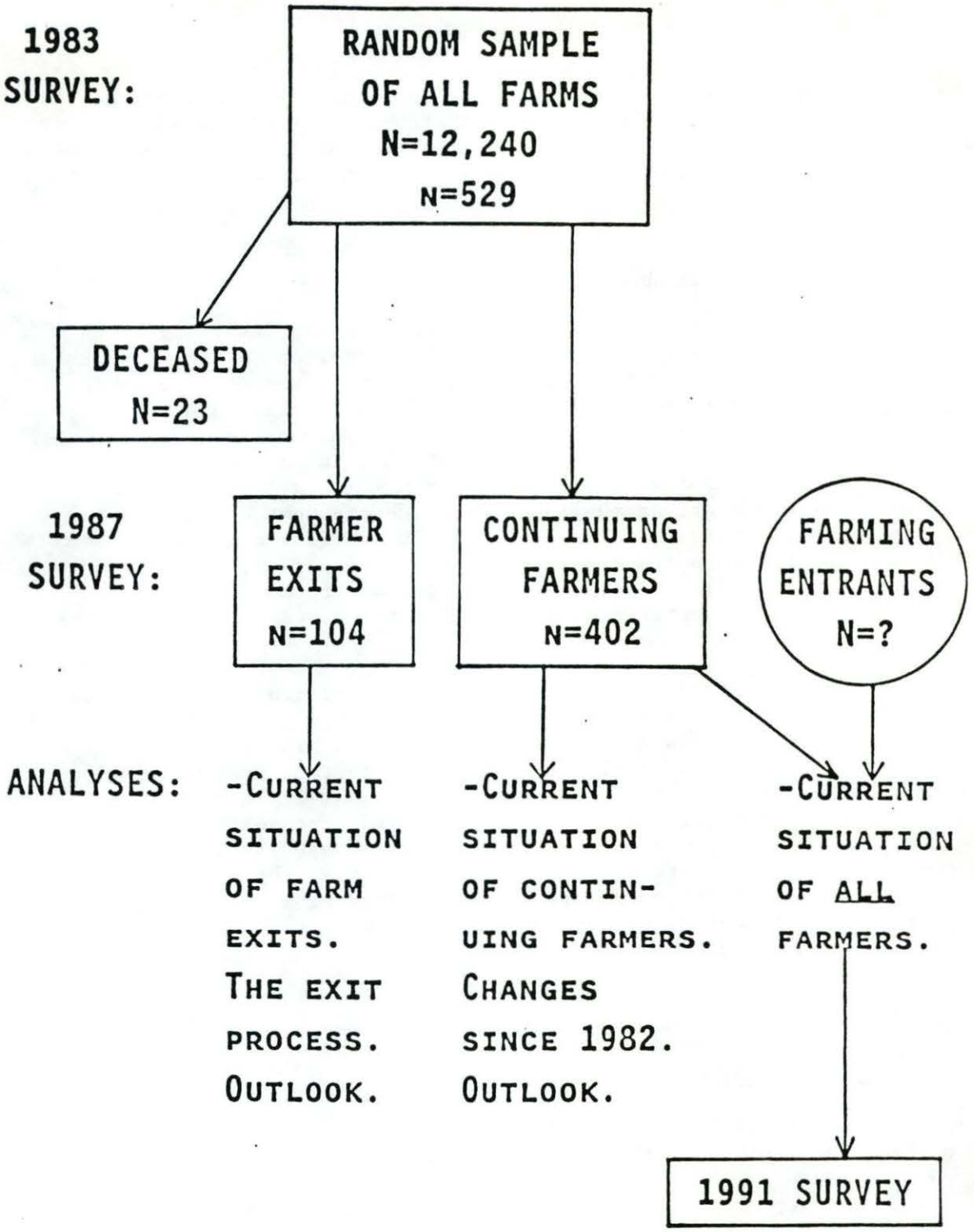

Figure 1 Distribution of Survey Respondents, 1983 and 1987 Wisconsin Family Farm Surveys

Regarding generalizations from the surveys to the study area, it should be noted that a) the 529 farm operators interviewed in 1983 constituted a random sample of all farmers in the study area at that time, b) the 104 operators that left farming are a random sample of all farmers in the study area who left farming by 1987, and c) the 402 continuing farmers are a random sample of all farmers who were farming in 1982 and continued to farm in 1987. However, without data on the farm entrants during the 1983 - 1987 period we cannot generalize to the current (1987) total farm population in the study area.[5/] Finally, the 104 farmers that left farming during that period (about 20 percent of the 1983 farmers) represent the gross movement of farm operators out of farming; to determine the net decrease, data on the farm operator entrants during the 1983 - 1987 period would be needed.

The focus of the 1987 Wisconsin Family Farm Survey was on the farm operator and the household of the operator, not on the farm business as the unit of observation. For the continuing farmers, the group of most interest here, we used a questionnaire similar to that used in 1983, obtaining information about labor allocation on and off the farm, farm household characteristics, farm assets, sources and amounts of farm credit, farm and nonfarm income, and farming practices. We also obtained information concerning how the farm household had responded to the change in the farm financial climate observed over the 1982 - 1986 period.

For those farm operators that had left farming we modified the questionnaire to obtain information regarding how the family had adjusted since leaving farming. Specifically, we obtained information about the employment status of adult family members, levels of wage and passive income, levels of debt including any remaining farm related debt,reasons for leaving farming, and the transition process used to leave farming.

The 1987 interviews were made on the farm, or place of residence in the case of persons who had left farming, by trained and experienced professional enumerators. Interviews averaged about 90 minutes in length. After interviews were completed there was an extensive data entry and screening process before analyses were initiated.

5/Anecdotal information indicates that there very few farm operator entrants in the study area during that period. The Wisconsin Agricultural Statistics Service added 88 farmers to their population name list in the eight study counties during those years, but when they were contacted each was found to have already been a farm operator in 1982. The mean characteristics for our sample of 402 continuing farmers is probably little different from the mean characteristics of all current farmers in the study area.

III. Characteristics of Multiple Job-Holding Farm Households in Wisconsin

In this section we present descriptive results pertaining to multiple job-holding of farm households, from the 1983 and 1987 surveys.

3.1 Level of Household Income

As illustrated in Figure 1, three-fourths of the farm operators in the 1983 survey continued to operate a farm in 1987. Of these 402 continuing farm operators, 342 (85 percent) were reinterviewed.[6/] For these farm operators who continued to farm in 1987, the mean total family income from all sources (in 1982 dollars) did not change significantly between 1982 and 1986. However, net income from farming was lower, with off-farm jobs and passive income from nonfarm investments and transfers making up the difference.[7/] Differences between 1982 and 1986 are statistically significant for the three major income categories, but not for total income or for wages paid to family members for work on their home farm.

As shown by Figure 2, between 1982 and 1986 net farm income as a percent of total household income decreased from 55 to 43 percent.[8/] In contrast, the role of off-farm employment as a source of income increased from 26 to 33 percent.

[6/] The means for the 15 percent who were nonrespondents in 1987 were compared with the 1987 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 were not different from a random sample of continuing farmers in the study area.

[7/] The distribution of income by source (in 1982 dollars) was as follows:

	1982	1986
Net Cash Farm Operating Income	$15,715	$12,058
Home Farm Wage Transfers	1,800	1,869
Off-Farm Employment Income	7,502	9,303
Non-Farm Transfers & Investment Income	3,502	4,600
Total Household Income	$28,519	$27,830

"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.

[8/] If home farm wage transfers are included in a measure of "farm related income", then the decrease would have been from 61 to 50 percent.

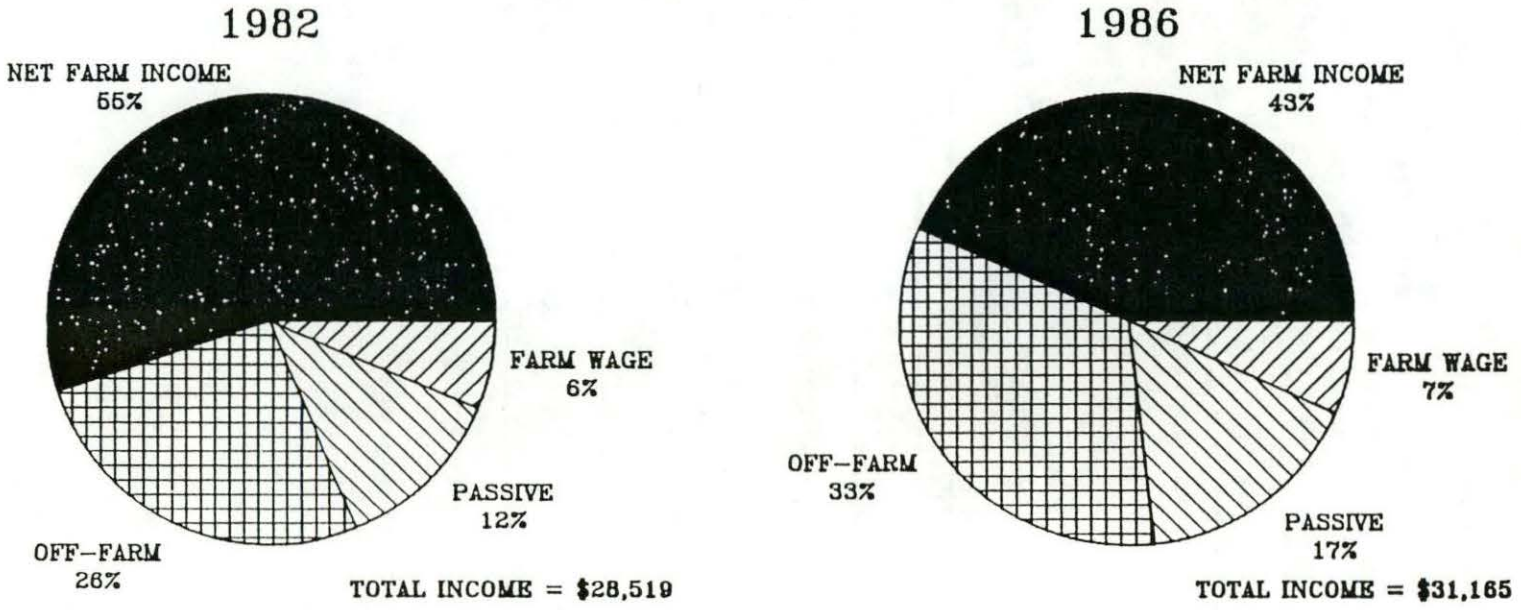

Figure 2 Distribution of Household Income by Source, 1982 and 1986
Southwestern Wisconsin

We can further examine the importance of off-farm income to the continuing farm households by partitioning them into two groups: a) those households that had no adult member working off-farm, and b) those where at least one member worked off-farm. The distribution of sources of household income for these two groups is presented in Table 1 for 1982 and 1986. For those households where there was some off-farm work, the proportion of total income originating from the farm was about 35 percent in both years. For those households with no off-farm work, over 78 percent of household income originated from net farm income in 1982 and 67 percent in 1986. This farm income is vulnerable to shocks from nature, input and product price changes, and adjustments in federal farm programs[9/] (25).

Table 1. 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 Total Income were $29,137 and $31,968 for households which did not have a household member working off-farm vs. those that did.

9/James Johnson and Kenneth Erickson, Agriculture and Rural Economy Division, Economic Research Service, US Department of Agriculture provided access to other data for Wisconsin that emphasize this point. During the five years 1982-86, average per farm income from farming fluctuated in a range from about $6,040 to $17,870, while that from nonfarm sources was consistently trending upward, from $11,100 to $14,300. This is discussed in more detail in Jesse et al. (25).

Our experience from the 1983 survey indicates that these averages hide great diversity in income, with some families doing reasonably well, and many others near or below federal poverty standards. From the 1986 survey data, the poverty threshold income according to the Federal poverty criteria was calculated for each household. The Federal poverty threshold of income varies by the number of family members, the number of children under the age of 18 years of age, and age of the household "head" in one and two person households. The poverty measure allows for a comparison of equivalent levels of well being across individuals and time. Using the observed household income levels and comparing them with the poverty income criteria, it was found that in 1986, 16 percent of the continuing farm households were at or below the poverty level. Ten percent more 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.[10/]

3.2 Employment Income and Wage Rates

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.

From Table 2, we see that the attributes of off-farm labor market participation differ substantially in a number of ways between farm operators and spouses. In both years, approximately one-fourth of the farm operators working off-farm were self-employed in nonfarm business enterprises. This compares with 10 percent or less of farm spouses.

Table 2. Distribution of Operator and Spouse Wages by Hours Worked Off-Farm, 1982 and 1986

	1982						1986					
Number of	Operator			Spouse			Operator			Spouse		
Hours Worked	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-Employed	27	--	--	10	--	--	25	--	--	6	--	--
Total	342	--	--	306	--	--	342	--	--	301	--	--

Source: 1983 and 1987 Wisconsin Family Farm Surveys

10/We acknowledge with thanks the collaboration of Susan Bentley, ERS, USDA in this part of the analysis.

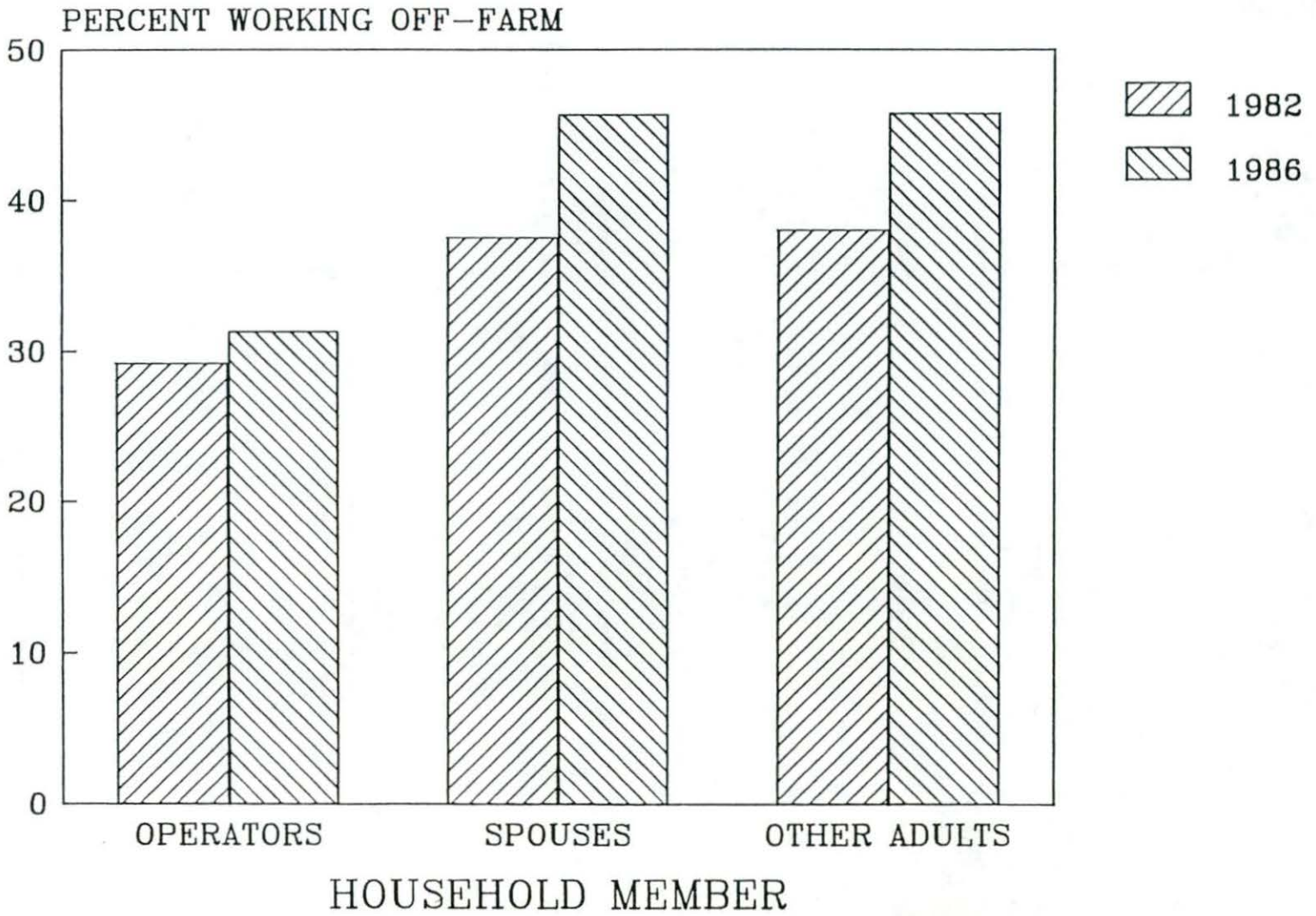

Figure 3 Proportion of Farm Family Members Working Off-Farm, 1982 and 1986 Southwestern Wisconsin

The extent of off-farm labor market commitment varied between operators and spouses. There appears to be a bimodal distribution of the number of farm operators that worked off-farm in terms of the number of hours worked, i.e. in 1982, 43 percent of those working worked less than 800 hours and 43 percent worked fulltime (over 1600 hours). In 1986, these proportions increased to 46 and 45 percent, respectively. In contrast to this pattern, there was a relatively even distribution among all three categories for farm spouses in both years.

In general, persons with full-time off-farm employment received higher wage rates than part-time workers.[11/] Farm operators working less than 800 hours in 1986 averaged $7.24 per hour, compared to $13.22 for those working full-time. Spouses working fewer than 800 hours averaged $5.76, compared with $7.43 for those working over 1600 hours per year.

All but one of the farm operators in these groups were male and all but one of the spouses were female. Without controlling for any other factor that affects wage rates, operator (male) wage rates were about three dollars higher than spouse (female) wage rates in both years.

3.3 Occupations of Multiple Job-Holding Farm Household Members

Besides the effect of full-time versus part-time work, differences in observed wage rates can be associated with the level of formal education and indirectly with occupation. In 1986, farm operators in our sample with under eight years of formal education earned an average of $6.95 per hour, while those with 12 years averaged $8.29. Operators with more than a high school education averaged $13.06. For the same year, spouses averaged $3.68, $5.83, and $8.15 per hour, respectively, for the same levels of education.

The distribution of wage workers among off-farm occupations differed for farm operators, spouses, and other adults (Table 3). For farm operators, there was a fairly equal distribution among teaching, agriculturally related nonfarm jobs, construction, nonfarm production, and transportation. For spouses, the most important were teaching, clerical and service occupations.

The distribution of all (rural and urban) Wisconsin wage earners among occupations is presented in the last three columns in Table 3, as reported in the 1980 Census of Population. Comparison of all Wisconsin male wage earners with the 1982 and 1986 sample farm operators shows that more of the latter were involved with public administration (mostly as local government officials on a part time basis), as teachers, and as workers in nonfarm agriculturally related occupations. Given the rural nature of the study region, it was not surprising that a lower proportion of farm operators worked in production related positions compared to male workers in the state as a whole.

11/While not completely consistent in this table, in unpublished multivariate analyses with these data the wage rates (and the receipt of fringe benefits) have been correlated with hours worked for both operators and

Table 3. Distribution of Off-Farm Wage Earners Among Occupations, 1982 and 1987

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	.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
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Off-Farm Workers	73	105	105	--	82	132	120	--	--	--	--

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.

Farm spouses from our sample were more concentrated in teaching and service occupations than their statewide female counterparts, equally concentrated in clerical work, but less so in nonfarm production occupations (see Table 3).

3.4 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 the next three tables.

In Table 4, the 342 continuing farm operators are partitioned according to farm type following the Census of Agriculture system. Seventy percent of the farms were categorized as dairy farms, nine percent as cash grain farms and 11 percent as other farm types. Given the time commitment associated with operating a dairy farm, it was not surprising that relatively fewer dairy farm operators and spouses worked off-farm. The 39 dairy farm operators that worked off-farm comprised 16 percent of total dairy

farmers, while 41 percent of all other operators worked off-farm. About 39 percent of the spouses worked off their dairy farms, compared with 55 percent for spouses of non-dairy farms. In addition, the dairy farm operators and spouses that did work off-farm, on average worked fewer hours off-farm.

Table 4. Mean Hours Worked On and Off-Farm by Off-Farm Work Status and Farm Type, Operators and Spouses, 1986

	Operator		Spouse	
Farm Type	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 Hours	4042	3882	2009[a]	1529
No. Of Observat.	39	199	84	129
Cash Grain				
Farm Hours	1061[a]	2312	302	113
Off-Farm Hours	1564	--	1336	--
Total Hours	2625	2312	1638[a]	113
No. of Observat.	13	17	13	11
Other Farm Types				
Farm Hours	1437[b]	2054	301[b]	750
Off-Farm Hours	1555	--	1356	--
Total Hours	2992[a]	2054	1657[a]	750
No. of Observat.	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 Observat.	82	260	132	169

Source: 1987 Wisconsin Family Farm Survey

Note: The superscripts refer to the significance of T-Tests of the mean farm hours worked for those operators and spouses who worked off-farm versus those who did not. The superscript "a" refers to significance at the .01 level and "b" to the .05 level. T-tests of differences in off-farm hours across farm types were also conducted (i.e. comparisons going down the columns) and it was found that dairy farm operators who worked off-farm had significantly less off-farm hours than did non-dairy operators.

Operator - spouse differences in the allocation of time among farm production, off-farm work, and home production are also suggested in the bottom panel of table 4. For all operators who worked off-farm, the off-farm hours (1177 hours) was approximately the same as those worked by spouses (1221 hours). However, those operators allocated an additional 2256 hours to work on the farm, compared to 658 by the spouses. Spouses, more than farm operators, seem to allocate time to a third demand, i.e. home production. We did not collect data on home production in this study, but this differential gives an indication of the allocation of time for home production by these spouses.

It is reasonable that farm operators and spouses that did not work off-farm worked significantly more hours on the farm than those who combined farm and off-farm work. Regarding total hours worked, however, farm operators worked essentially the same total hours whether they were multiple job-holders or not (3433 hours vs. 3470 hours). Spouses who combined farm with off-farm work averaged more total hours, 1879 hours compared with 1303 hours for spouses who did not.

3.5 Distribution of Hours Worked by Farm Size

In Table 5, the surveyed farms are divided according to size, measured by the number of operated acres. Fourteen percent of the farms had 100 acres or less, 34 percent operated between 101 and 250 acres, 27 percent operated between 251 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 farms (18 of 38 operators), to 16 percent for the largest farms (14 of 86 operators). Regardless of farm size, farm operators who worked off-farm worked significantly fewer farm hours compared to those who did not. 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.

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 was 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 1722 hours in the largest farm size category. In contrast to the trend observed for farm operators, the total farm plus off-farm work time of spouses with off-farm work was greater than for those that did not work off-farm, except for the largest sized farms.

Table 5. Mean Hours Worked On and Off-Farm by Off-Farm Work Status and Farm Size, Operators and Spouses, 1986

	Operator		Spouse	
Farm Size	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 Hours	3054[a]	2175	1558[a]	831
No. of Observat.	18	30	24	21
101-250 Acres				
Farm Hours	2265[a]	3184	771	1050
Off-Farm Hours	1103	--	1336	--
Total Hours	3368	3184	2107[a]	1050
No. of Observat.	37	78	49	50
251-400 Acres				
Farm Hours	2767[a]	3757	718[b]	1379
Off-Farm Hours	824	--	1264	--
Total Hours	3591	3757	1982[a]	1379
No. of Observat.	13	80	29	54
401+ Acres				
Farm Hours	2992[a]	3999	702[b]	1722
Off-Farm Hours	956	--	962	--
Total Hours	3948	3999	1664	1722
No. of Observat.	14	72	30	44

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 also conducted (i.e. comparisons going down the columns) 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 6. 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 Hours	2800	2838	1361	938
No. of Observat.	19	75	20	55
.01 to .40				
Farm Hours	2264[a]	3732	625[a]	1508
Off-Farm Hours	1277	--	1282	--
Total Hours	3541	3732	1907	1508
No. of Observat.	41	120	71	74
.41 to .70				
Farm Hours	2905	3456	899	1319
Off-Farm Hours	730	--	970	--
Total Hours	3635	3456	1869	1319
No. of Observat.	10	37	23	21
.71 or more				
Farm Hours	2754[a]	4054	997	1544
Off-Farm Hours	1147	--	1363	--
Total Hours	3901	4054	2360	1544
No. of Observat.	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 versus those who did not. The superscript "a" refers to significance at the .01 level and "b" to the .05 level.

3.6 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 6, three-quarters of the operators had debt-to-asset ratios of .40 or less.

There were 94 survey farmers with no debt, which was 27 percent of the total. 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 for the debt free group 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.

IV. Analyses of Multiple Job-Holding from Wisconsin Farm Survey Data

We now turn from primarily descriptive information to insights about multiple job-holding by farm household members that were gained from multivariate analyses of the 1983 and 1987 Wisconsin Family Farm Surveys data.[12/]

McCarthy and Salant (26) analyzed the decision of married farm women to allocate labor to off-farm employment, using the 1983 survey data. Their model of the labor allocation decision was estimated in the following four steps: a) the likelihood of off-farm labor market participation, b) the level of the off-farm market wage rate, c) the likelihood of receiving fringe benefits in the off-farm employment, and d) the estimated hours of off-farm work. They found that being employed or looking for off-farm work by married farm women was associated positively with years of formal education and having received nonfarm vocational training, and negatively with living on a dairy farm and the level of net farm income. The estimated off-farm wage rate was also positively associated with years of formal education, as was the probability of receiving health insurance as a fringe benefit. The latter was also positively associated with holding a public administration job and negatively related to having a health problem that limited work at some time during the year. Finally, hours of work in the off-farm job was positively associated with the wage rate, and negatively with having preschool children in the home, and having a disabling health problem.

12/ Summaries of such analyses are necessarily incomplete, because the interpretation of the significance and signs of explanatory variables can be properly interpreted only when the complete model is studied, i.e. the variables were significant given some set of other control variables. Readers are directed to the complete published reports for more information.

Belknap and Saupe (27) used the 1983 Wisconsin Family Farm Survey data to analyze the simultaneous decisions by farm operators and spouses in allocating their labor between farm and off-farm work. They first estimated a farm "production function" based on gross farm sales, to estimate the marginal return to operator and spouse labor on the farm. Next, potential off-farm wages for operator and spouse were estimated following the Heckman procedure for testing and correcting for sample selection bias. Finally, the four estimates of returns to labor (on and off the farm, for both operator and spouse) were combined with other explanatory variables in a multinomial logit equation that calculated the probabilities of four possible outcomes, as follows: neither operator or spouse works off the farm, both work off the farm, the operator only works off the farm, or the spouse only works off the farm.

From the farm production function, Belknap and Saupe found the marginal return to farm labor to be $5.68 per hour for the operators and $5.49 per hour for spouses when evaluated at the mean, compared with $9.14 and $5.00 per hour, respectively for off-farm work. Estimated wage rates were positively influenced by having completed more than a high school education and years of prior off-farm work, in the case of the operator, and by years of prior off-farm work and the distance commuted in the case of the spouse. Being a dairy farmer was negatively related to wage rate in the case of the operator.

The probability of the farm operator working off-farm was positively related to the number of persons in the household, but negatively related to the presence of pre-school children, the size of the farm measured by gross sales, the passive income received from nonfarm assets, and the proportion of farm sales that came from a dairy enterprise. The probability of the spouse working off-farm was positively associated with her years of formal education, having received nonfarm vocational training, and receiving health insurance as a fringe benefit of off-farm work. It was negatively related to the weeks she was disabled during the year, the presence of pre-school children, and by the total tractor horsepower available on the farm.

In their multinomial logit, Belknap and Saupe found that the probability of both the operator and spouse working off-farm was positively associated with the spouse having received nonfarm vocational training, the presence of teenagers in the household, and paying a relatively high rate of interest on farm loans; it was negatively associated with being a dairy farm, having relatively large quantity of tractor horsepower on the farm, and receiving relatively large amounts of passive income from nonfarm assets. A high return to operator labor relative to the spouse labor both in farm work and off-farm work, increased the probability that only the operator would work off the farm.

Gould and Saupe (28) 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 spouses, 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).

V. Concluding Comments

Because of their timing, the longitudinal Wisconsin Family Farm Surveys are an important resource for measuring status and change in many aspects of farm family well-being, with implications that reach well beyond their southwestern Wisconsin site. Their detailed information on the allocation of time by farm adults between farm and off-farm work make them well-suited for study of many multiple job-holding issues. They will continue to be useful in providing descriptive detail not available in national surveys, as a source of well-defined variables for hypothesis testing and modelling, and for describing farm family circumstances for local users in the study area.

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