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**Intrinsic and Extrinsic Motivations and Participation in Off-farm Work
Among U.S. Farm Women**

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Intrinsic and Extrinsic Motivations and Participation in Off-farm Work Among U.S. Farm Women

Introduction

The agricultural sector in most countries has undergone numerous modifications and adjustments in the past century (Ahearn and Lee, 1991; Gardner, 1992). One of the major changes in farming has been a decline in the number of farms and an increase in the multiple job-holding by farm household members, especially among women on U.S. farms (Hallberg *et al.*, 1991). In the United States, around 71 percent households have either the principal farm operator or spouse or both employed in off-farm jobs (Mishra, El-Osta, Morehart, Johnson and Hopkins, 2002). Families combine farming with other off-farm activities for different objectives such as career development, lifestyle or personal fulfillment (Barlett, 1986). According to several studies, the growth of small farms in the United States and Canada may be due to the motivation of farm members to seek off-farm employment to support a favored lifestyle (Coughenour and Swanson, 1983; Bryden, 1994; Bessant, 2000). Fuller and Madge (1976) note that off-farm employment gives farm families a chance to interact with new people and to stabilize farm incomes. Mishra and Goodwin (1997) and Mishra (1996) found a positive correlation between off-farm employment and farm income variability, indicating that off-farm employment helps many farm households to diversify income risks.

Studies have documented women's extensive participation in farm and off-farm work. Rosenfeld (1985), studying on U.S. farm women in 1980, concluded that higher average education levels, advances in labor-saving technologies in the home, and smaller family sizes have contributed to the trend toward more U.S. farm women being employed off the farm. The off-farm income contributions of women have increased, due to both higher participation rates of farm women in external (off-farm) labor markets and to the higher real wages earned by women today (Olfert, 1993; Findeis, 2002). In the 1980 U.S. National Farm Survey (Rosenfeld, 1985), reasons for working off-farm varied: 57% of farm women reported financial reasons, 18% stated social reasons, 16% acknowledged maintenance of career skills, and the remaining 9% gave other (miscellaneous) reasons for working off-farm. The larger proportion of women employed off the farm for financial reasons suggests that working women have an important role in keeping the farm financially secure. Several studies also indicate that farm women prefer to work off-farm as it is associated with better

living conditions, more stable income, economic independence, social security, better work conditions and social acknowledgment and respect (Efstratoglou, 1998; O'Hara, 1998).

Different motivations to work off-farm exist and depend on the prevailing circumstances of the farm household and available off-farm job opportunities. But very few studies have analyzed the factors affecting work motivations, and the impacts of these motivations on individual behavior, e.g., the decision to engage in off-farm employment. Researchers have divided work motivations into economic and non-economic, or extrinsic and intrinsic, motivations. A person is extrinsically motivated when he/she works because of the monetary compensation for work; in contrast, an intrinsically-motivated individual derives direct utility from the work *per se* (Cappellari and Turati, 2004). Theories have been developed in relation to extrinsic and intrinsic motivations and how motivations, individually or the relationship between these motivations, might affect individual behavior (Ambrose and Kulik, 1999). Working at a non-farm job requires both motivation to enter the rural non-farm economy and ability to extract a continuous and rewarding livelihood from it. Factors such as the policy environment, institutions and vulnerability context in combination with individual characteristics, family characteristics, farm-related factors, financial, and locational characteristics of different households, will result in differing rural non-farm economy entry motivations, access capabilities and livelihood trajectories.

Given the above perspective, this paper examines factors affecting motivations for off-farm work among farm women in the U.S. Women were asked to rank different reasons for working in an off-farm job varying from *not important*, to *somewhat important*, to *very important*. Models are estimated in response to the motivation questions in the 2001 Penn State survey. Since the motivation questions on the 2001 Women on Farms Survey are answered by only farm women working off-farm, the problem of sample selection bias may exist. Hence, ordered probit models corrected for sample selection bias are estimated for the motivation choices. Further, few studies have estimated the impact of extrinsic vs. intrinsic motivations on individual work/activity participation. Hence, for this paper, motivations to work off-farm are divided into intrinsic and extrinsic motivations using the technique of factor analysis and then a multinomial logit model is estimated to understand the influence of selected factors on intrinsic and extrinsic work motivations in

the case of off-farm work decision. The paper uses data from a national survey of U.S. farm women conducted by Pennsylvania State University in collaboration with researchers at the Economic Research Service (ERS, USDA) and the National Agricultural Statistics Service (NASS, USDA). The next three sections lay out the theoretical framework, data and the estimation strategy for the paper. Finally the last section concludes with a discussion of the results.

Theoretical Framework

Models of the household that recognize individual behavior and disaggregate preferences should be considered. Let us consider a farm household consisting of two members m and f who can choose to work on household's farm or to work off-farm. The paper uses a static Nash bargaining model with agricultural production in the household to analyze the labor allocation decisions of individuals in a farm household.

An action (such as the time spent working) taken over a period of time affects the individual's utility in two ways. On the one hand and in this case, the action taken results in a wage paid by an employer, with various consumption goods bought with that wage. As a result, the individual receives a direct satisfaction from the goods. Further, employment also can involve the receipt of non-pecuniary benefits which yield economic satisfaction. This is consistent with the concept of extrinsic motivation, when individuals are motivated to work by the economic returns from work. On the other hand, there is maybe utility gained from the very act of working itself, and not dependent on wages and benefits. This can be classified as an intrinsic kind of satisfaction from the activity. With explicit consideration of extrinsic and intrinsic motivations, the two members m and f of the farm household maximize the Nash product of their gain in utilities:

$$1. \text{ Max} \quad [1.1]$$

$$N = \left[\{U^m(C, B^m, L^m) + D^m(\nabla)\} - \{V^m(P_c, P_q, P_x, B^m, W^m, I^m; \alpha^m) + D^m(\wp)\} \right]^* \\ \left[\{U^f(C, B^f, L^f) + D^f(\nabla)\} - \{V^f((P_c, P_q, P_x, B^f, W^f, I^f; \alpha^f) + D^f(\wp)) \right]$$

Subject to

$$1) \text{ Farm production function: } Q = (F^m, F^f, X; A, \Pi, \Omega) \quad [1.2]$$

$$2) \text{ Budget constraint: } P_q Q - P_x X + W^m M^m + W^f M^f + I^m + I^f = P_c C \quad [1.3]$$

$$3) \text{ Total Time Endowment: } T^i = L^i + F^i + M^i \quad [1.4]$$

$$\text{Non-negativity constraint for farm work: } F^i \geq 0 \quad [1.5]$$

$$\text{Non-negativity constraint for off-farm or market work: } M^i \geq 0 \quad [1.6]$$

where $i = m, f$, and $U^i =$ utility function for individual i , $V^i =$ threat point of individual i , which is the result of maximizing the indirect utility in a state when an agreement is not reached, $C =$ vector of consumption goods, including a shared public good, $Q =$ farm output produced, $X =$ variable inputs used in farm production, $A =$ fixed quantity of land, $\alpha^i =$ EEPs for individual i , $\Pi =$ vector of household characteristics, $\Omega =$ farm-specific exogenous characteristics such as rainfall, climate, soil type, $P_c =$ price of consumption goods, $P_q =$ price of farm outputs, $P_x =$ price of variable inputs, $W^i =$ market wage for individual i , $L^i =$ time allocated to leisure by individual i , $F^i =$ time allocated to farm work by individual i , $M^i =$ time allocated to market work by individual i , $T^i =$ total time available to individual i , $I^i =$ non-labor income of individual i . $U^i(C, B^i)$ represents the goods or benefits that wages can buy (associated with extrinsic motivations), and $D^i(\nabla)$ is utility from the action itself (associated with intrinsic motivations) where $i=m, f$. Motivations can depend on factors including personal characteristics, farm or family characteristics, and local labor market variables, as examples. The $D^i(\emptyset)$ is then a part of utility when threat point utility is considered, and also represents utility from the action itself, but depends on different factors when under threat. , e.g. $D^i(\nabla)$ includes husband's characteristics when married, but not when divorced. The utility function is assumed to be twice differentiable, i.e., $U_i > 0$ and $U_{ii} < 0$, where i represents the arguments of the utility function.

Data

The data used for this study have been taken from a survey of farm women in the United States recently collected by Penn State in collaboration with the Economic Research Service (ERS) and the National Agricultural Statistics Service (NASS) at the U.S. Department of Agriculture. Rosenfeld collected the last

major survey on farm women in 1980 (see Rosenfeld, 1985). This survey was carried out by telephone. A sum of 2,661 farm women responded to the survey. A small subset of farm men was also included in the survey, so that joint-decision making can be understood in a better way. The survey focused on questions like women's view of their roles on the farm, their participation in farm decision-making and farm work, possession of land and bequest issues, application of computers on-farm and sustainable farm practices. Other questions asked were related to operation of the farm and demographic characteristics of the farm household. Data from Regional Economic Information System of the Bureau of Economic Analysis (REIS/BEA) and the 2000 census for the U.S. has been appended to the main dataset, so that information is available on variables related to off-farm labor market like population density, local employment and unemployment growth rates, non-farm wage rates and area of the county. The survey data also includes information on county of residence, which was used as a basis to match the data with the nine productions regions differentiate by U.S.D.A. as: Heartland, Northern Crescent, Northern Great Plains, Prairie Gateway, Eastern Uplands, Southern Seaboard, Fruitful Rim, Basin and Range, and the Mississippi Portal. The new ERS regions created by the U.S.D.A, which represent geographic specialization in production of various farm goods, are based on four sources: a cluster analysis of U.S. farm characteristics, Farm Production Regions, the USDA Land Resource Regions, and NASS Crop Reporting Districts.

Estimation Strategy and Variable definitions

The Penn State Survey asked the women respondents to rank the reasons for working in a non farm job varying from *not important*, to *somewhat important*, to *very important*. The data collected from farm women participating in that survey show that approximately 70% of working-age farm women employed off the farm ranked working to cover household expenses, and about 55% rank maintaining job skills, securing benefits such as health insurance and having an independent income as *very important* reasons for working off-farm (Table 1). Another, one-fifth of working-age farm women included other motivations such as working to socialize with people or supporting farm expenses as *very important*. However, approximately 50% of the farm women, who are 65 years of age or older, rank socializing and being independent and another 41% rank supporting household expenses as *very important* reasons for having off-farm jobs (Table 1).

Table 1 Importance of Alternative Reasons for Off-farm Employment, 2001 Survey

Motivation	Working-age*		65 years of age or older	
	Very important (%)	Somewhat important (%)	Very important (%)	Somewhat important (%)
Cover household expenses	69.18	20.91	41.67	29.17
Support farm operation	32.85	23.88	27.08	18.75
Receive benefits(employer-provided)	54.82	8.63	29.17	10.42
Develop or use job skills	54.87	25.99	35.42	29.17
Get out of house, see people	39.03	28.03	50.00	25.00
Have own source of income	54.61	22.95	52.08	20.83

* 18-64 years inclusive

In terms of other motivations, more than one-third consider maintaining skills and around one-fourth consider receiving employer benefits and supporting farm expenses as *very important* reasons for participating in the off-farm labor market. In addition, approximately 30% of farm women 65 years of age or older rank supporting household expenses and maintaining skills in the *somewhat important* category. Ordered probit models are estimated for each of the motivations to examine the factors affecting the reasons to work in a non-farm job. The dependent variable reflects the ordinal rankings for the specific motivations (i.e., very important, somewhat important, not important) and the independent variables reflect factors potentially affecting reasons for working in a non-farm job. Further, since the motivation question in the survey is answered only by those women who work off the off-farm, this may lead to the problem of sample selection bias. Heckman's procedure is widely used to correct the problem of sample selection bias (Heckman, 1979). Hence, ordered probits incorporating a correction for sample selectivity are estimated for each of the motivations. The motivation choices include 1) wanted the money for family household expenses, 2) wanted money for supporting farm expenses, 3) wanted benefits, 4) wanted to develop or use job skills, 5) wanted to get out of the house, see people, 6) wanted to have own source of income. The method of maximum likelihood is used for estimating the coefficients of the estimators.

Finally motivations are divided into intrinsic and extrinsic motivation using the technique of factor analysis. and multinomial logit models are estimated based on the following alternative participation-motivation choices: (Y=0) no work, (Y=1) work with extrinsic motivation, and (Y=2) work with intrinsic motivation to determine the effect of factors affecting the labor participation decisions of those farm women working off-farm for extrinsic reasons and those working for intrinsic reasons. The method of maximum likelihood estimation (MLE) is used for estimating the coefficients of the estimators. For ease of interpretation, the marginal effects¹ of the multinomial model rather than the coefficient estimates are discussed. Descriptive statistics of the variables used in the estimation of the off-farm work with motivation equations for the farm woman are included in Table2. The table is for the full sample. The table shows differences in means by work with motivation status, i.e., no off-farm work (Y=0), work with extrinsic motivation (Y=1) and work with intrinsic motivation (Y=2). The independent variables in the models include characteristics of the individual, the household, farm and off-farm labor markets. Individual characteristics are reflected by including age, and age-squared variable; level of schooling including less than high school (reference category) and dummy variables for high school graduate, vocational training or some college, college graduate, and post-graduate (reflecting human capital); household characteristics by presence of children of different age groups; farm characteristics² by amount of land owned (in acres); local labor market conditions with variables including commuting zone unemployment rate and commuting zone population growth rate; and regions as controls and represented by the USDA farm production regions. The statistical package used in the empirical analysis was LIMDEP 8.0.

¹ The results of multinomial logit models are somewhat more difficult to interpret than the results from binary logit models. The major difference is that the reference category in the multinomial logit is not the other choice as in a binary logit, but another category. Thus, whereas in a binary logit model the likelihood of event A is compared with that of event B (or non-A), in a multinomial logit model, the likelihood of event A is compared with that of event B, and the likelihood of event B is compared with that of event C and so on. Since this makes the estimated coefficients in the multinomial logit model more difficult to interpret (Greene, 1992), only the marginal effects of the independent variables on choice probability are typically reported and discussed. These can be computed from the parameter estimates in the multinomial logit model. As well, standard errors can be estimated for the marginal effects, allowing for the computation of t-statistics for the probability estimates.

Table 2 Descriptive Statistics for Work with Motivations for Farm Women, 2001 Survey			
Variable	Means		
	No Off-farm Work	Work with Extrinsic Motivation	Work with Intrinsic Motivation
Age (years)	57.51	49.09	47.92
Age squared	3469.78	2510.59	2367.11
Presence of: Children under 6 years of age (1=yes)	0.08	0.10	0.09
Children age 6 to 11 years (1=yes)	0.12	0.16	0.15
Children age 12 to 18 years (1=yes)	0.15	0.28	0.33
Children over 18 and away years (1=yes) <i>Reference category: Children under 6 years of age</i>	0.20	0.29	0.32
Farm woman educational attainment High school graduate	0.44	0.35	0.35
Vocational/technical school/some college	0.30	0.30	0.31
College graduate	0.11	0.19	0.19
Post graduate <i>Reference category: Less than high school</i>	0.04	0.12	0.13
Labor market characteristics Commuting zone unemployment rate (year 2000)	0.04	0.04	0.04
Commuting zone population growth rate (1990-2000)	0.11	0.10	0.11
Farm characteristics Land owned (acres)	496.77	335.06	248.14
Growing up years for farm woman In country, but not on farm	0.12	0.11	0.15
In small town	0.22	0.28	0.23
Suburban or urban area <i>Reference category: Growing up on a farm or ranch</i>	0.49	0.51	0.51
ERS farm production regions Northern Crescent	0.14	0.19	0.14
Eastern Uplands and Mississippi Portal	0.21	0.19	0.19
Southern Seaboard	0.11	0.09	0.08
Fruitful Rim	0.11	0.07	0.08
Basin and Range <i>Reference category: Heartland, Northern Great Plains, Prairie Gateway</i>	0.05	0.03	0.05

Results of Ordered Probits with Sample Selection

Table 3 summarizes the results of the ordered probit models with corrections for sample selection for the six motivations, presenting the estimated coefficients and the level of significance for the independent variables used in the estimations. Results indicate that age plays an important role for farm women motivated to work off-farm to help farms cover farm expenses and to meet or see people (Table 3). More specifically, the age and age-squared variable are statistically significant. The maximum likelihood of motivation to participate in off-farm work is at approximately 37 years of age for farm women participating to help cover farm expenses and 51 years of age for farm women participating to meet or see other people. Hence, for U.S. farm women in this sample, the motivation of working off-farm to support farm expenses is particularly important when they are in their thirties or forties, but this changes to socializing with others in their early fifties and sixties.

Family characteristics are represented by the presence of children in different age-groups. Table 3 shows that farm women are less likely to be motivated to work off-farm for supporting farm expenses when children are less than six years of age or when they are between the ages of 6 and 11 inclusive. However, they are motivated to work off-farm for meeting or seeing people when children are between the ages 6 to 11 (inclusive). This is quite understandable, since younger children require more care, and women tend to stay at home and take care of them. However, once the children are in the school-age category, women have more time available and may feel the need to get away from the home atmosphere, to socialize with other people. When children are present in the over 18 and away category, this motivation actually plays a smaller role.

Increased emphasis on education ensures higher productivity in the labor market and translates into higher off-farm income. Hence, farm women with high degrees of educational attainment are likely to want to maintain their skills by continuous labor force participation. Otherwise they face the risk of losing their job credentials, especially if employed in occupations such as education and health services, where constant up-grading of skills is needed due to new techniques and discoveries. Results indicate that compared to the less than high school category, farm women with more education are more likely to be motivated to work

off-farm to maintain their skills. Farm women with 4-year college degree or post-graduate degree are less likely to work off-farm to meet and see people relative to those without a high school degree (Table 3). Thus, farm women in this sample who are highly educated, are more motivated to work off-farm to maintain their skills and less motivated to work off-farm to meet and see people.

For the labor market characteristics, the coefficient for the commuting zone population growth rate variable is statistically significant for farm women working off-farm to receive non-pecuniary compensation (Table 3) implying that population growth in local labor markets contributes to a local farm population where women engage in off-farm work to provide work-related benefits that they need. The financial position of the farm family is likely to influence motivation for off-farm work to support household expenses, farm expenses, and working to receive employer provided non-pecuniary benefits, as can be seen by the statistically significant coefficient on the level of debt. Several studies (Shortall, 2000; Shortall and Kelly, 2001) have concluded that some farms are solely dependent on the earnings of farm women from off-farm sources, and hence income may be used to reduce the debt of the farm operation (Table 3). Further, if the amount of land owned (in acres) is large, then farm women are more likely to be motivated to work off-farm to meet people. This conclusion is consistent with results found in a study by Ramon and Baylina (2000). It should be noted that large farms in the U.S. are more likely to be located in regions with lower population densities.

A new variable 'place of growing up' was included as an independent variable to test if growing up on a farm as compared to a suburban/urban area affects the intensity of different motivations to work off-farm. The results show that as compared to growing up on a farm or ranch, farm women raised in a small town are more likely to be motivated to work off-farm to maintain their skills and to meet people and women growing up in suburban or urban areas are less likely to be motivated to work off-farm to support farm expenses. This variable can be interpreted in terms of rural and urban attitudes and impacts on motivations. Women growing up in small towns have had a different residential background and might identify more with an urban lifestyle, and hence, are more motivated to maintain their job skills and to socialize than to support the farm.

Variable	Support household expenses	Support farm expenses	Receive benefits	Maintain skills	Have own income	See people
Intercept	-1.157 (-0.48)	-2.814 (-1.99)**	-1.592 (-0.67)	-0.172 (-0.10)	0.042 (0.02)	3.041 (2.81)***
Age (years)	0.114 (1.07)	0.146 (2.64)***	0.079 (0.80)	0.023 (0.32)	0.059 (0.57)	-0.101 (-2.28)**
Age squared	-0.001 (-0.94)	-0.002 (-2.74)***	-0.001 (-0.74)	0.000 (-0.38)	-0.001 (-0.51)	0.001 (2.320)**
Household size	0.036 (0.32)	N.A.	N.A.	N.A.	N.A.	N.A.
Presence of:	0.216 (0.97)	-0.319 (-1.71)*	-0.255 (-1.10)	0.005 (0.02)	-0.270 (-1.07)	0.082 (0.52)
Children under 6 years of age (1=yes)	-0.014 (-0.07)	-0.340 (-2.28)**	0.127 (0.67)	-0.003 (-0.02)	0.030 (0.14)	0.204 (1.66)*
Children age 6 to 11 years (1=yes)	0.010 (0.06)	-0.131 (-1.19)	-0.041 (-0.32)	0.026 (0.21)	-0.084 (-0.84)	0.106 (1.18)
Children over 18 and away (1=yes)	-0.093 (-0.42)	-0.132 (-1.07)	-0.117 (-0.90)	0.087 (0.69)	-0.017 (-0.13)	-0.169 (-1.98)**
Farm woman educational attainment	-0.327 (-0.88)	0.034 (0.13)	0.238 (0.67)	0.185 (0.63)	-0.504 (-1.40)	-0.436 (-2.29)**
High school graduate	-0.338 (-0.83)	0.045 (0.16)	0.335 (0.85)	0.422 (1.33)	-0.444 (-1.15)	-0.524 (-2.67)***
Vocational/technical school/some college	-0.418 (-0.82)	0.294 (0.91)	0.419 (0.85)	0.738 (1.92)**	-0.455 (-0.87)	-0.496 (-2.18)**
College graduate	-0.213 (-0.34)	0.292 (0.75)	0.446 (0.76)	0.771 (1.68)*	-0.368 (-0.51)	-0.614 (-2.20)**
Post graduate <i>Reference category: Less than high school</i>	2.402 (0.45)	-3.294 (-0.94)	3.505 (0.84)	-0.193 (-0.05)	-3.441 (-0.77)	N.A.
Labor market characteristics	0.148 (0.31)	0.128 (0.26)	0.987 (1.84)*	0.334 (0.75)	-0.491 (-1.11)	N.A.
Commuting zone unemployment rate (2000)	N.A.	-0.021 (-0.17)	N.A.	N.A.	N.A.	N.A.
Commuting zone population growth rate (1990-2000)	N.A.	-0.081 (-0.81)	N.A.	N.A.	N.A.	N.A.
Farm inherited or purchased:						
Through her family						
Through his family						

Table 3 (continued) Ordered Probits with Sample Selection for Motivations for Farm Woman's Off-farm Work, 2001 Survey ¹						
Farm characteristics	0.0001	-0.0001	-0.00002	0.00003	0.0001	0.0002
Land owned (acres)	(0.65)	(-1.02)	(-0.38)	(0.28)	(0.51)	(2.64)***
Debt of farm operation	0.286	0.279	0.191	0.051	N.A.	N.A.
More than \$50,000	(2.04)**	(2.28)**	(1.72)*	(0.42)		
<i>Reference category: \$50,000 (inclusive) or less</i>						
Growing up years for farm woman	N.A.	0.132	N.A.	0.217	N.A.	-0.048
In a country, but not on farm		(0.92)		(1.43)		(-0.41)
In a small town	N.A.	-0.128	N.A.	0.268	N.A.	0.175
		(-1.18)		(2.40)**		(1.98)**
Suburban or urban area	N.A.	-0.076	N.A.	0.005	N.A.	-0.023
<i>Reference category: Growing up on a farm or ranch</i>		(-1.75)*		(0.10)		(-0.61)
ERS farm production regions	-0.227	-0.223	-0.112	0.115	-0.041	0.099
Northern Crescent	(-1.40)	(-1.74)*	(-0.74)	(0.77)	(-0.33)	(0.93)
Eastern Uplands and Mississippi Portal	0.024	0.019	-0.037	0.160	0.250	0.123
	(0.15)	(0.14)	(-0.26)	(1.17)	(1.88)*	(1.25)
Southern Seaboard	0.264	-0.015	0.201	0.270	0.126	0.192
	(1.05)	(-0.08)	(0.99)	(1.37)	(0.60)	(1.42)
Fruitful Rim	-0.164	0.109	-0.546	0.179	-0.001	0.239
	(-0.74)	(0.56)	(-2.36)**	(0.87)	(0.002)	(1.57)
Basin and Range	-0.162	-0.219	-0.344	-0.275	-0.377	-0.252
<i>Reference category: Heartland, Northern Great Plains, Prairie Gateway</i>	(-0.58)	(-0.90)	(-1.29)	(-1.11)	(-1.73)*	(-1.27)
Model performance indicators						
Log-likelihood function	-1340.69	-1509.53	-1413.28	-1456.09	-2089.70	-2151.89
Restricted log-likelihood function	-1340.74	-1510.38	-1413.39	-1456.10	-2089.71	-2152.55
Chi-squared	0.11	1.69	0.31	0.02	0.01	1.40
Number of observations	1374	1374	1374	1374	1888	1888
*** = statistically significant at the 0.01 level; ** = significant at 0.05 level; * = significant at 0.10 level.						
¹ t-statistics are shown in parentheses.						

Finally, the nine USDA farm resource regions have been used as controls for farming systems, broadly defined. The base category consists of the Heartland, Northern Great Plains, Prairie Gateway, with dummy variables being used to indicate the other regions. The results show that farm women in the Northern Crescent region are less motivated to work off-farm to support household expenses. The result is quite understandable since Northern Crescent is an area with mainly dairy, cash, and livestock farms. Out of these, dairy farm operations are quite labor intensive, and hardly leave any time for any other activity. Another interesting result to note is that farm women in the Eastern Uplands and Mississippi Portal regions are more likely to be motivated to work off-farm to have their own source of income whereas the opposite holds true for the Basin and Range region (Table 3).

As compared to other regions, the Eastern Uplands and Mississippi Portal are regions where there are a large number of small farms. As a result, this region has the highest number of off-farm days of work reported (Eathington and Swenson, 2001) and farm households depend on off-farm sources to cover most of their expenses. Tobacco, poultry and (small-scale) cattle farms are primarily found in this region (USDA, 2000) where both the farm woman and spouse/partner may be working off the farm or the spouse/partner works on the farm and the farm woman works in the off-farm labor market. Additionally, Table 3 shows a lower likelihood of being motivated to work off-farm to receive benefits in the Fruitful Rim. This region has the largest share of family and non-family farms and receives the highest overall average of \$12,000 in government payments per farm (Eathington and Swenson, 2001). These are observed to be relatively wealthy families and, hence, farm women may not be motivated to work off-farm to receive employer-provided benefits.

Results of the Multinomial Logit Estimation

The results of the multinomial logit estimation are presented in Table 4. The marginal effects for age and age-squared are statistically significant for all choice categories. The results are indicative of a life-cycle effect of age for *no off-farm work category*, *work with extrinsic motivation* and *work with intrinsic motivation*. The results show that the likelihood of working with intrinsic and extrinsic motivation increases with age, reaches a peak and then declines with increasing age.

According to Table 4, there is a positive and significant relationship *between work with intrinsic motivation* and any level of educational attainment (relative to having not completed high school), but *work with extrinsic motivation* becomes significant only at higher levels of educational attainment. Hence, as compared to the less than high school category (reference category), farm women who are high school graduates or vocationally or technically trained work with intrinsic motivation whereas farm women with 4-year college degrees and post-graduate degrees work both with intrinsic and extrinsic motivations. Education usually increases the skills and marginal productivity of an individual's time. Thus, with completion of more years of schooling, it would be expected that an individual receives higher wages in the labor market. Hence, *work with extrinsic motivation* becomes more significant with higher levels of educational attainment. *Work with intrinsic motivation* implies work for own satisfaction, therefore it is not a surprise that it is significant for all levels of schooling.

Family characteristics are represented by including presence of children in different age groups. As shown in Table 4, farm women are less likely to work off-farm with intrinsic or extrinsic motivation and more likely to stay on the farm or at home, when children are less than six years in age or between ages six to eleven, likely because young children require a lot of care and attention. However, once the children are older (particularly above eighteen or living away from home), then farm women are more likely to work off-farm with both extrinsic motivation and intrinsic motivation, as can be seen from the statistically significant coefficients in Table 4.

Among the local labor market variables, results the model results in Table 4 indicate that a low commuting zone unemployment rate increases the likelihood of work with extrinsic motivation. At the same time, a high commuting zone unemployment rate contributes to a greater likelihood of no off-farm work. A low commuting zone unemployment rate can be considered as an indicator of strong, robust local economy, thereby making it easier to find jobs for farm women working in the labor market for external or monetary rewards.

Table 4 Marginal Effects for Multinomial Logit Model with Motivations for Farm Woman's Off-Farm Work, 2001 Survey. ¹			
Variable	No Off-farm Work	Work with Extrinsic Motivation	Work with Intrinsic Motivation
Intercept	-0.442 (-5.11)***	0.317 (4.13)***	0.125 (1.70)*
Age (years)	-0.001 (-5.30)***	0.001 (2.98)***	0.0004 (2.71)**
Age squared	0.0002 (14.97)***	-0.0001 (-8.67)***	-0.0001 (-10.59)***
Presence of:			
Children under 6 years of age (1=yes)	0.250 (4.99)***	-0.117 (-2.79)***	-0.133 (-3.69)***
Children age 6 to 11 years (1=yes)	0.172 (4.10)***	-0.059 (-1.71)*	-0.114 (-3.87)***
Children age 12 to 18 years (1=yes)	0.018 (0.49)	-0.023 (-0.79)	0.006 (0.23)
Children over 18 and away years (1=yes)	-0.086 (-2.73)***	0.042 (1.60)*	0.045 (2.01)**
Farm woman educational attainment			
High school graduate	-0.152 (-2.63)***	0.022 (0.43)	0.130 (2.30)**
Vocational/technical school/some college	-0.178 (-3.00)***	0.028 (0.53)	0.150 (2.63)***
College graduate	-0.301 (-4.67)***	0.100 (1.77)*	0.201 (3.41)***
Post-graduate	-0.476 (-6.51)***	0.188 (3.07)***	0.289 (4.70)***
<i>Reference category: Less than high school</i>			
Labor market characteristics			
Commuting zone unemployment rate (year 2000)	1.806 (2.07)**	-2.660 (-3.19)***	0.854 (1.38)
Commuting zone population growth rate (1990-2000)	-0.049 (-0.35)	-0.073 (-0.60)	0.121 (1.18)
Farm characteristics			
Land owned (acres)	0.0001 (4.39)***	-0.00001 (-0.58)	-0.0001 (-3.51)***
Growing up years for farm woman			
In country, but not on farm	0.052 (1.26)	-0.055 (-1.54)	0.003 (0.12)
In small town	0.002 (0.08)	0.030 (1.14)	-0.033 (-1.38)
Suburban or urban area	0.018 (1.50)	-0.007 (-0.72)	-0.011 (-1.21)
<i>Reference category: Growing up on a farm or ranch</i>			
ERS farm production regions			
Northern Crescent	0.058 (1.51)	0.037 (1.19)	-0.096 (-3.32)***
Eastern Uplands and Mississippi Portal	0.057 (1.50)	0.014 (0.44)	-0.071 (-2.55)**
Southern Seaboard	0.110 (2.24)**	-0.003 (-0.06)	-0.107 (-2.86)***
Fruitful Rim	0.126 (2.22)**	-0.018 (-0.37)	-0.107 (-2.53)**
Basin and Range			
<i>Reference category: Heartland, Northern Great Plains, Prairie Gateway</i>	0.066 (0.93)	-0.063 (-0.97)	-0.002 (-0.05)
Model Performance Indicators			
Number of observations : 2034 Log likelihood function: -1854.075 Restricted log likelihood: -2136.669			
Chi squared : 565.1890 *** Pseudo R-squared: 0.13			
*** = statistically significant at the 0.01 level; ** = significant at 0.05 level; * = significant at 0.10 level.			
¹ t-statistics are shown in parentheses.			

The statistically significant coefficient for land owned, shows that a large farm reduces the probability of working off-farm with intrinsic motivations and increases the probability of no off-farm work (Table 4). Land owned can be an indicator of farm operations size and asset holdings (wealth). Thus, farm women coming from farm families with sufficient assets are less likely to work off-farm (Mahoney and Spitze, 1991).

In terms of the farm production regions, as compared to farm women in the Heartland, Northern Great Plains, and Prairie Gateway, farm women from the Northern Crescent, Eastern Uplands and Mississippi Portal, Southern Seaboard and Fruitful Rim are less likely to be intrinsically motivated to work off-farm and farm women in the Southern Seaboard and Fruitful Rim regions are more likely to be working on the farm (Table 4). This is quite understandable as these are the regions where farm women are the ones often running the small farms while the spouse/partner works off-farm.

Conclusion

One of the major changes in the U.S. agriculture has been the persistent and increasing occurrence of off-farm employment and pluriactivity among farm households, especially among women farmers and as a result, more reliance on non-farm income. Women work off-farm for various reasons, ranging from supporting the farm or house financially, meeting people and having an own source of income. According to Barlett (1991: 45), multiple job-holding is an 'adaptive strategy' for reducing risk and increasing income and consumption levels. However, very few studies have tried to explore motivations to work off-farm. In particular, no studies have tried to analyze the impact of intrinsic and extrinsic motivations in combination with characteristics at the individual level such as age, experience, education, presence of children, and assets or debt on labor market participation in the context of farm populations working off-farm. Motivations of farm women to work off-farm are affected by age and education. Women in their early thirties are motivated to work off-farm for paying farm expenses and in their late fifties and sixties are to meet and socialize with other people. Similarly, higher education motivates and enables women to work for benefits and maintaining skills. The results showed that all the levels of educational attainment (high school, vocational/technical education, four year college degree and post-graduate degree) are found to be

significant for work with intrinsic motivation, but only higher levels of educational attainment (four year college degree and post-graduate degree) are found to be significant for work with extrinsic motivation. In terms of local labor market characteristics, a low commuting zone unemployment rate is found to increase the likelihood of working with extrinsic motivation, since it can be considered as an indicator of strong, robust local economy, thereby making it easier to find jobs for farm women working in the labor market for external (benefits) or monetary rewards. Land owned (in acres), reflecting farm characteristics, was found to increase the probability of no off-farm work and reduce the likelihood of working off-farm with intrinsic motivation. Hence, the study showed that human capital, farm and family characteristics, labor market characteristics, and regional variation not only affected individual motivations, but also motivations to work for intrinsic and extrinsic reasons. U.S. farm households are diversifying their economic activities to a greater extent now than in the past, hence it is important to understand the motivations, means and outcomes of this heterogeneous diversifying process, so that appropriate rural development initiatives can be introduced to facilitate off-farm job opportunities and higher non-farm wages.

References:

- Ahearn, M.C., and J.E. Lee, Jr. 1991. "Multiple Job-Holding Among Farm Operator Households in the United States." In M.C. Hallberg, J.L. Findeis, and D.A. Lass, eds. *Multiple Job-holding Among Farm Families*. Ames: Iowa State University Press.
- Ambrose, M. L., and C. T. Kulik. 1999. "Old Friends, New Faces: Motivation Research in the 1990s." *Journal of Management* 25(3):231-292.
- Barlett, Peggy. 1986. "Part-time Farming: Saving the Farm or Saving the Life-style?" *Rural Sociology* 51:289-313.
- Bessant, K.C. 2000. "Part-time Farming Situations Among Manitoba Farm Operators: A Typological Approach," *Canadian Journal of Agricultural Economics* 48(3):259-277.
- Bryden J. 1994. "Towards Sustainable Rural Communities: From Theory to Action." In J. Bryden, ed. *Towards Sustainable Rural Communities*, Canada: University of Guelph, pp 211–234.
- Cappellari, L., and Gilberto Turati. 2004. "Volunteer Labor Supply: The Role of Worker's Motivation." *Annals of Public and Cooperative Economics* 75:619–643.
- Coughenour, C.M., and L. Swanson. 1983. "Work Statuses and Occupations of Men and Women in Farm Families and the Structure of Farms." *Rural Sociology* 48:23-43.
- Eathington, L., and Dave Swenson. 2001. "Profiles: Government Farm payments and Other Government transfer payments in the United States." ISU Economics Working Paper #NDN0096, Department of Economics, Iowa State University.
- Efstratoglou, Sophia. 1998. "Fthiotis (Greece)." "The Labor Situation of Farm Women and Factors which Influence it at Individual Level." Brussels: European Commission, CAP Studies, chapter 3, and 8 in *Labor Situation and Strategies of Farm Women in Diversified Rural Areas of Europe*. Final Report - December 1998.
- Findeis, Jill L. 2002. "Hired Farm Labor: A Dynamic Workforce. The Dynamics of Hired Farm Labor: Constraints and Community Responses." In J. Findeis, A. Vandeman, J. Larson and J. Runyan, eds. *The Dynamics of Hired Farm Labor: Constraints and Community Responses*. UK: CAB-International.
- Gardner, Bruce L. 1992. "Changing Economic Perspectives on the Farm Problem." *Journal of Economic Literature* 30(1):62-101.
- Hallberg, M., J. Findeis, and D. Lass. 1991. *Multiple Job-holding Among Farm Families*. Ames: Iowa State University Press.
- Mishra, A.K. 1996. "Farm Income Variability and the Off-Farm Labor Supply of Farmers and Their Spouses." Unpublished Ph.D. Dissertation, Department of Economics, North Carolina State University, Raleigh, NC.
- Mishra, Ashok K., and Barry K. Goodwin. 1997. "Farm Income Variability and the Supply of Off-Farm Labor." *American Journal of Agricultural Economics* 79(3):880-887.
- Mishra, Ashok K., Hisham S. El-Osta, Mitchell J. Morehart, James D. Johnson, and Jeffrey W. Hopkins. 2002. *Income, Wealth, and the Economic Well-Being of Farm Households*. Washington DC: U.S. Department of Agriculture, Farm Sector Performance and Well-Being Branch, Resource Economics Division, Economic Research Service, Agricultural Economic Report No. 812.

O' Hara, Patricia. 1998. *Partners in Production? Women in Farm and Family in Ireland*. Berghahn Books: New York.

Olfert, Rose M. 1993. "Off-farm Labor Supply with Productivity Increases, Peak Period Production and Farm Structure Impacts." *Canadian Journal of Agricultural Economics* 41:491-501.

Ramón, D.M., and M. Baylina. 2000. "Gender and Rural Restructuring: A Literature Review through some Spanish and European Journals." Department of Geography, Autonomous University of Barcelona. Accessed at: <http://www.ub.es/geoagr/111.PDF>

Rosenfeld, Rachel. 1985. *Farm Women*. Chapel Hill: The University of North Carolina Press.

Shortall, Sally. 2000. "Gendered Agricultural and Rural Restructuring: A Case Study of Northern Ireland." *Sociologia Ruralis* 42(2): 160-175.

Shortall, S. and R. Kelly. 2001. *Gender Proofing CAP Reforms*. The Rural Community Network NI, Cookstown.