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Non-Farm Business Income and Its Subsequent Impacts on the Financial Viability of U.S. Farm Households

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Introduction

It is well documented in the literature that farm households have diversified their earnings off of the farm. This includes working full and/or part time by the operator and/or spouse. Reasons for working off the

farm vary from increasing family income to meet consumption needs, obtain non-pecuniary benefits (e.g. health insurance), stabilize total household income because of fluctuating farm income, etc. There is a portion of total non-farm income that has not received as much attention – income earned from operating a non-farm business. The implications and differences of farm households with non-farm business income is the focus of this portion of this research.

Figure 1 provides an outline for the flow of the ARMS data analysis. A comparison of those households who had non-farm business income and those who did not is discussed first. Following this discussion, the implications of those with and without non-farm business income are expanded further through a logit and tobit model. Next, the discussion only considers those farm households who reported having non-farm business income. Young farm households, operator less than 35 years old, and their older counterparts are compared. This discussion is followed by comparing beginning farmers, less than 10 years farming experience, relative to their more experienced counterparts. Next is to compare farm households who had non-farm business income across different sales classifications. Combining two segmentations of the data, beginning farmers and <$250,000 gross farm sales, is then discussed. Operator's whose primary occupation is farming and is not farming are compared next. Two classification systems are considered, the ERS Farm Typology and the U.S. Farm Household Typology and their differences across farm households with non-farm business income. Reported loans and reported loan purposes conclude the analysis.

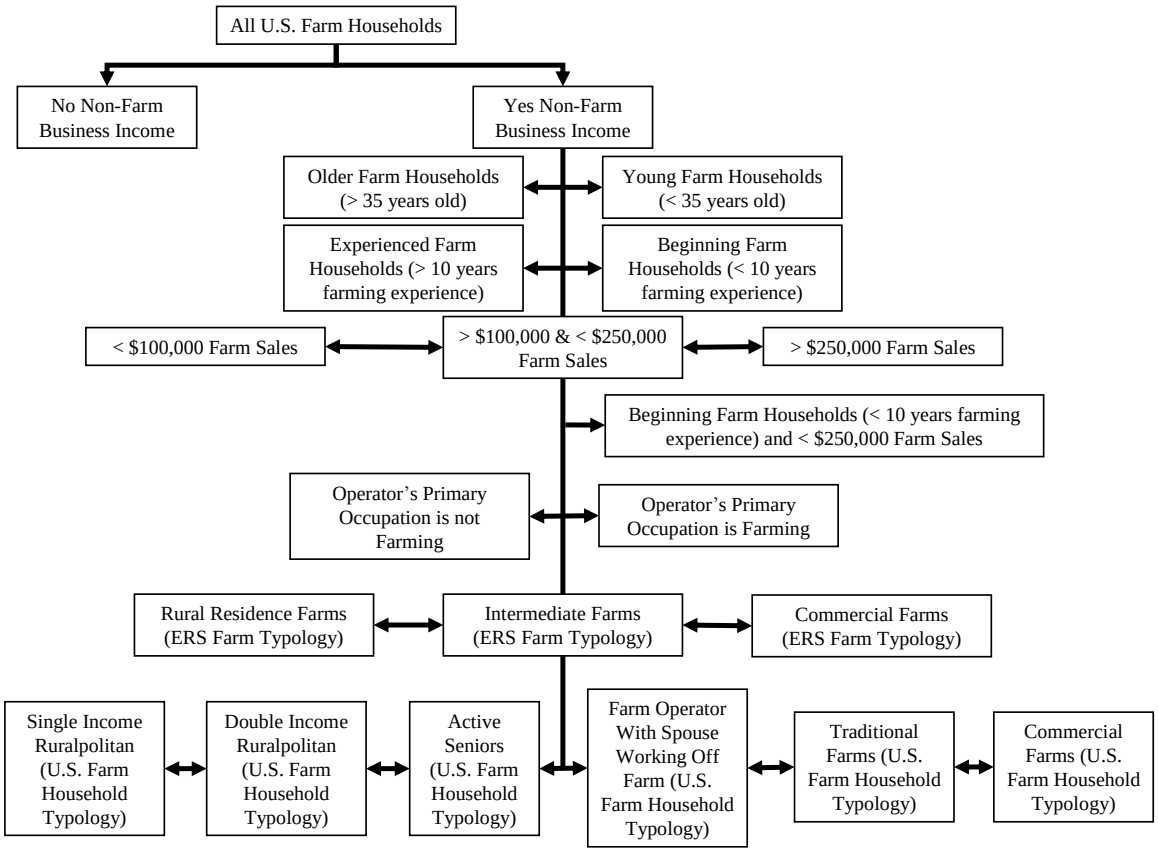

Figure 1. Outline for Data Discussion

U.S. Farm Households With and Without Non-Farm Business Income

The first comparison per figure 1 is to look at those farm households in the 2004 ARMS data set who did and did not have non-farm business income. Table 1 contains these results.

Net farm income is typically measured with a large amount of error because it varies widely across farms. Net farm income in 2004 is more stable relative to 2003[1], which may be due to the highly profitable year in U.S. agriculture in 2004. In 2004, those households who had income from a non-farm business actually had a higher average net farm income relative to their counterparts. However, the pairwise t-test statistic for the 2004 net farm income is not statistically significant for net farm income as shown in table 1. The median net farm income for households without non-farm business income was -$1,010 and the median net farm income for households with non-farm business income was $659. In addition, the C.V. on net farm income for households without non-farm business income is higher than their non-farm business income counterparts' C.V. A higher C.V. indicates there is more variation around the mean. Therefore, there are more households in the group without non-farm business income who fall in the upper and lower tails of the distribution of net farm income.

The percent value of production, in this case, is based on the aggregate U.S. value of production since the entire sample or the entire representative U.S. population is considered. In 2004, households who reported non-farm business income accounted for only 19.83% of the total value of production. Therefore, those households without non-farm business income represent the majority of the total value of production.

Total off farm income for those households who had income from a non-farm business is strikingly higher. On average, total off farm income is approximately $55,000 higher and is statistically significant. Note that this total off farm income includes income from their non-farm business. Also, the average reported non-farm business income, $49,550, is approximately equal to the total off farm income for those households who did not have non-farm business income, $54,858.

Farm assets and farm net worth across these two types of households is approximately equal (pairwise t-tests are not statistically significant). Non-farm assets and non-farm net worth is statistically different and higher for those households who have non-farm business income. This captures the commitment/investment of these households to their non-farm business as well as all other non-farm investments. Also, those households with non-farm business income have a higher debt-to-asset ratio relative to their counterparts in table 1 but it is not statistically significant.

Due in part to a higher total household income, households with non-farm business income have a higher average total household expenditures by approximately $6,000 in 2004. Also, this difference is statistically significant. The operator and spouse spend approximately the same amount of time working on the farm across both groups. This is consistent in 2004 as well as 2003. Off farm labor is higher for the operator and spouse if the household reported having non-farm business income. This is not surprising given these households are operating a non-farm business.

[1] Although the results from 2003 are not presented, the standard error of net farm income in 2003 for households who had income from a non-farm business is extremely high and is therefore problematic. For nearly all classifications considered, the net farm income in 2003 has reliability concerns because the standard error is too high. This is support for only considering the 2004 ARMS data set in the analysis.

Table 1. 2004 ARMS Data of Farm Households Who Have Versus Those Who Do Not Have Non-Farm Business Income

	No NFBI		Yes NFBI		
Income Characteristics	Mean	C.V.	Mean	C.V.	T-Statistic
Non-Farm Business Income	$0	0.00%	$49,550	11.12%	8.99
Net Farm Income	$11,149	27.90%	$18,443	16.85%	1.66
Total Off Farm Income	$54,858	14.99%	$110,269	6.82%	4.97
Gross Farm Sales	$99,257	28.68%	$104,923	35.51%	0.12
Percent Value of Production	80.17%		19.83%		
Financial Characteristics					
Farm Assets	$627,228	26.08%	$657,986	49.88%	0.08
Non-Farm Assets	$209,463	12.43%	$404,922	6.07%	5.46
Farm Net Worth	$567,782	25.85%	$607,490	52.09%	0.11
Non-Farm Net Worth	$187,253	17.07%	$334,488	8.30%	3.48
Debt-to-Asset Ratio	10.14%	33.91%	13.82%	10.50%	0.99
Household Characteristics					
Household Expenditures	$36,803	8.59%	$42,720	3.86%	1.66
Household Size	2.68	11.17%	2.73	4.98%	0.16
Operator Farm Hours	1,682	7.49%	1,459	5.08%	-1.53
Spouse Farm Hours	429	51.81%	405	11.14%	-0.11
Operator Off Farm Hours	980	50.77%	1,417	4.55%	0.78
Spouse Off Farm Hours	854	49.27%	1,065	5.66%	0.44
Operator/Farm Characteristics					
Operator Age	56.94	2.66%	55.35	2.20%	-0.81
Young Farmer (< 35 years old)	5.00%		3.17%		
Farmer Tenure	24.53	17.32%	18.04	4.84%	-1.50
Beginning Farmer	24.85%		41.27%		
Gross Farm Sales					
< $10,000	25.09%		29.36%		
> $10,000 and < $100,000	55.79%		54.55%		
> $100,000 and < $250,000	9.87%		7.99%		
> $250,000	9.25%		8.09%		
Farming Primary Occupation	39.61%		39.71%		
Percent of Owned Acres	76.02%	1.59%	77.18%	2.40%	0.52
College Degree = 1	22.41%		24.25%		
Loan Characteristics					
Percent Who…					
Have a Farm Loan	41.44%		35.87%		
Have a Farm Non-Real Estate Loan	19.12%		17.28%		
Have a Farm Real Estate Loan	28.46%		25.84%		
Have a Farm Short Term Loan	12.91%		13.62%		
Percent Who…					
Have a Non-Farm Home Loan	5.31%		7.47%		
Have an Other Mortgage Loan	5.70%		8.11%		
Have a Non-Farm Business Loan	4.72%		19.82%		
Have a Non-Farm Personal Loan	34.77%		34.37%		
Representative Number of Farms	1,643,495		423,878		
Sample Size	5,337		1,369		

There are only 5% or approximately 95,612 representative farm household operators who are considered young farmers (< 35 years old) in the aggregate sample. Only 3% of those household operators who reported having non-farm business income, where considered young. Farmer tenure measures how long the farmer/operator has been operating her farm. Those households with non-farm business income had a significantly lower amount of farm tenure or 18 years farming experience compared to 25 years on average. Therefore, it is not surprising that a larger proportion of beginning farmers (<10 farming experience) have non-farm business income – approximately 41% of this particular group. In the aggregate sample, there are approximately 28% farm households who meet the beginning farmer definition.

The presented sales classifications are less than $10,000 gross farm sales, greater than $10,000 gross farm sales and less than $100,000 gross farm sales, greater than $100,000 gross farm sales and less than $250,000 gross farm sales, and greater than $250,000 gross farm sales. It is interesting to note that those who reported having and not having non-farm business income are dispersed equally across the different sales classifications. Even though the sales classifications may be equally dispersed, we know from the percent value of production numbers that the primary producers do not report having non-farm business income. Therefore, a proportionally larger number of high gross farm sales farms reside in the group who did not report having non-farm business income. This result is further discussed in the logit model below.

Farm operators were asked to report what their primary occupation was in 2004. The percentage results across the two groups considered are nearly equal. Although there are a larger total number of farm operators who state they are farmers without non-farm business income, the percent of each sample is essentially equal. If these farm operators are indeed farmers, it stands to reason that a proportion of their acres would be leased/rented because of increasing land values. In other words, it is more financial feasible and economical for farmers to lease/rent land. The percent of owned acres for farm households with non-farm business income, 77.18%, is approximately equal to their counterparts. This may be influenced by farming being the primary occupation results for each group.

Finally, the percent of households with a farm loan is higher for those households without non-farm business income, 41.44%, relative to their non-farm business income earning counterparts, 35.87%. This is may be due to access to farm credit by those households without non-farm business income. For both groups, the largest percent of farm loans reside in real estate based loans. What about non-farm loans? Interestingly, each group had about 43% of their respective sample reporting a non-farm loan. Of course this includes personal loans (i.e. credit cards) but a larger percentage of farm households with non-farm business income reported having a non-farm business loan – 19.82% compared to 4.72%. This result begs the question: why would a household without any income from a non-farm business have non-farm business debt? The answer is because these households are investors in a non-farm business and not reporting any income generated from this business. In other words, this is a way to diversify their financial portfolio as opposed to a different source of income.

Explaining the Common Factors of Those Who Have versus Those Who Do Not Have Non-Farm Business Income

It is assumed that a farm household invests in a non-farm business if the returns from that business exceed the costs of generating those revenues. More formally, the farmer will invest in businesses with a positive net present value (NPV):

$$NPV = \sum_{t=0}^{T} \delta \left(R_t - C_t \right) \tag{1}$$

where T is the terminal period of the investment, δ is the discount rate (for simplicity assume it is constant), R and C represent the non-farm business' revenues and costs, respectively. This simple model

provides a framework to illustrate that a farmer should invest in a non-farm business when the NPV is positive.

Logit Model

The objective in this section is to explain, via regression, the distinguishing characteristics of those farm households who receive income from a non-farm business (i.e. had an initial positive NPV). The dependent variable, *Y*, is restricted to being 1 for farm households who report receiving non-farm business income and 0 otherwise. Since *Y* is binary, the probability, *P*, of *Y* = 1 is regressed on a set of independent variables, ***X***, which are hypothesized to impact *Y*:

$$P_i = E(Y = 1 \mid \mathbf{X}_i) = \alpha + \beta\ \mathbf{X}_i + e_i \tag{2}$$

where α is the intercept; β is the estimated coefficient of interest relative to ***X*** for the i^{th} observation; *e* is the error assumed to have mean 0 and constant variance. A straightforward logit model is estimated:

$$P_i = \frac{1}{1 + e^{-(\alpha + \beta\ \mathbf{X}_i)}} \tag{3}$$

Since the β do not have a direct economic interpretation, the marginal effects are calculated. A marginal effect is directly interpreted as the percentage change in the probability of *Y* being equal to 1 as one variable in ***X*** increases by one unit.

The independent variables of interest, ***X***, that impact whether *Y* equals one are presented in table 2. They are farm net worth (*FNW*), non-farm net worth (*NFNW*), total household income (*TOTHHI*), gross farm sales (*SALES*), farm tenure (*TENURE*), operator age (*AGE*), primary occupation is a farmer (*FARMER*), miles from a town with a population of 10,000 (*MILES*)[2], operator has a college education (*COLLEGE*), farm primarily produces crops (*CROP*)[3], and if a farm household has a non-farm loan (*NONFRMLOAN*).

Table 2 shows the predicted signs and the results from the aforementioned logit model. The predicted signs show the hypothesized impact of each independent variable on the probability of a farm household having non-farm business income, *P*. *FNW* may positively or negatively impact *P* because wealthier farm household may want to diversify their investment portfolio or income stream to a non-farm business. On the other hand, a larger investment in the farm may cause the farm household to only focus on operating the farm. *NFNW* is expected to positively impact *P* or more non-farm net worth increases the likelihood a farm will have non-farm business income. It is unclear how *TOTHHI*, *AGE*, *COLLEGE*, and *CROP* will impact *P* however, these are important variables that may impact *P* and must be accounted for. *SALES*, *TENURE*, *FARMER*, and *MILES* are all expected to negatively impact *P*. Higher *SALES* represents a larger commitment to the farm, which results in a negative impact on *P*. As *TENURE*, increases *P* is expected to decrease because human capital is being built up on the farm and there is an opportunity cost to transfer these skills to a non-farm business. If a farmer reports her primary occupation is farming, then the likelihood they earn non-farm business income is decreased. The more rural a farm household or as *MILES* increases, it is expected that *P* will decrease. Finally, *NONFRMLOAN* may increase or decrease *P*.

[2] Although not presented in table 1. The mean distance from a town with a population of 10,000 for a farm household who does not have non-farm business income is 24.55 miles and 17.17 miles for their counterparts.

[3] Although not presented in table 1, the mean percentage of farm households whose primary agricultural production is crops for a farm household who does not have non-farm business income is 39.68% and 45.69% for their counterparts.

Table 2. Logit Model Predicted Signs and Results - Base Group is Farm Households with Non-Farm Business Income

Variables	Predicted Sign	Parameter Estimate	Standard Error	T-Statistic	Marginal Effects
Intercept		-1.3776	1.0779	-1.28	-0.33887
FNW [$10,000]	+/-	0.0002	0.0014	0.14	0.00005
NFNW [$10,000]	+	0.0051	0.0018	2.82***	0.00126
TOTHHI [$10,000]	?	0.0419	0.0135	3.10***	0.01031
SALES [$10,000]	-	-0.0081	0.0055	-1.47	-0.00199
TENURE	-	-0.0293	0.0148	-1.97*	-0.00720
AGE	?	0.0084	0.0158	0.53	0.00206
FARMER	-	0.1743	0.5012	0.35	0.04289
MILES	-	-0.0142	0.0057	-2.51**	-0.00349
COLLEGE	?	-0.2833	0.4811	-0.59	-0.06968
CROP	?	0.2633	0.6103	0.43	0.06476
NONFRMLOAN	+/-	-0.1878	0.4286	-0.44	-0.04619
	Pseudo R^2	0.0896			

Note: 10%, 5%, and 1% statistical significance is represented by *, **, and ***, respectively. Numbers in parentheses represent the variables scale.

Based on the logit model results, *NFNW*, *TOTHHI*, *TENURE*, and *MILES* are all statistically significant at least at the 10% level. Each measure meets their predicted sign discussed above. As *NFNW* increases, the probability that a farm household will have non-farm business income increases. For every $10,000 of *NFNW*, *P* increases by 0.1%. So, higher non-farm wealth households are more likely to have non-farm business income. Higher total household income is associated with farm households who have non-farm business income. It is important to note that *TOTHHI* includes income from the farm, the non-farm business, wages/salaries, dividends, or simply put all income. For every $10,000 of *TOTHHI*, *P* increases by 1.03%. The more experienced an operator has on the farm, the less likely they have non-farm business income. This statement is supported by *TENURE* negatively impacting *P* and being statistically significant. The further a farm household is from a town of 10,000, the lower the likelihood a farm household will have non-farm business income. This result is supported by the fact that more remote households do not have the market exposure a non-farm business may need to operate.

Although *SALES* is not statistically significant, the predicted sign matches its associated marginal effect sign or more *SALES* decreases *P*. Even though the average *SALES* for those without non-farm business income was lower than their non-farm business income counterparts, the negative sign on the *SALES* marginal effect states that larger *SALES* producers lie in the group without non-farm business income. It is interesting to note that *COLLEGE*, *CROP*, and *NONFRMLOAN* do not significantly impact *P*. In other words, these are not primary drivers in determining the likelihood a farm household has non-farm business income.

Tobit Model

The logit model results show the probability of an individual receiving non-farm business income. Key determining factors of farm households with non-farm business income are: net worth, total household income, farm tenure, and proximity to a town of 10,000 people. These findings are informative but the

discussion would benefit from an analysis of the marginal impact each of these variables has on non-farm business income. In other words, one more additional unit of a key factor will bring this much more non-farm business income. This will allow for further inferences into the financial viability of farm households with non-farm business income.

Since 20.5% of the weighted sample reported non-farm business income, a censored regression model is necessary. A Tobit model is estimated to control for the censoring on non-farm business income. Following Greene, *Y** is the unobserved dependent variable or the latent variable on non-farm business income for the i^{th} household:

$$\begin{aligned} Y_i^* &= \mathbf{X}_i'\beta + e_i, \\ Y_i &= 0 \text{ if } Y_i^* \le 0, \\ Y_i &= Y_i^* \text{ if } Y_i^* > 0 \end{aligned} \tag{4}$$

where ***X*** is the independent variables of interest (farm net worth, non-farm net worth, all other household income except for non-farm business income (*ALLOTHINC*), gross farm sales, proximity to a town of 10,000 people and a dummy variable for 1 year or less of farming experience); β is the marginal effect of the unobserved *Y**; and *e* is the normally distributed error term.

The β, in this context, is interpreted as if the entire sample reported non-farm business income. This shows the marginal effect of each independent variable on non-farm business income if the entire sample were to expand into a non-farm business. Although this is an interesting empirical result to analyze, it will overstate the importance of each independent variable or key factor on non-farm business income because *Y** is unobserved. Therefore, a transformation of β is necessary to analyze the marginal effect of each β on the censored mean or the observed *Y*. Following Greene, this transformation is as follows:

$$\frac{\partial E[Y_i \mid \mathbf{X}_i]}{\partial \mathbf{X}_i} = \beta\Phi\left(\frac{\beta'\mathbf{X}_i}{\sigma}\right) \tag{5}$$

Each β is multiplied by the normally distributed disturbances of $\frac{\beta'\mathbf{X}_i}{\sigma}$. Note that σ is the estimated scale variable or standard deviation of *Y** from equation 4. Thus, these marginal effects are censored at zero and show the marginal effect of each independent variable on the observed *Y* or households that reported non-farm business income.

Before discussing the results from equation 4, the square of gross farm sales (*IGFI2*) is added as an independent variable. It is hypothesized that at some level of gross farm sales enough human capital is accumulated that expanding into a non-farm business is warranted. Therefore, it is hypothesized that the squared gross farm sales will in fact yield a positive sign or add to the likelihood non-farm business income is reported. Also, farm tenure is transformed into a dummy variable to consider the impact those farm operators who just entered farming (*BEG1*). It is hypothesized that this will significantly impact non-farm business income because they are new entrants to farming with an established non-farm business.

The results from the estimated Tobit model are presented in table 3. Statistical significance is noted on the parameter estimates of the same key factors discussed in the logit model above. Parameter estimates on the latent variable should be interpreted with caution because they are based on the entire population

having non-farm business income (i.e. unobserved *Y**). It is more appropriate to focus on the marginal effects for those with non-farm business income.

Table 3. Tobit Model Results on Non-Farm Business Income

Independent Variable	Parameter Estimate on Latent Variable	Marginal Effect on Censored Mean
Intercept	-149,433.45**	
	(67,265.45)	
FNW [$10,000]	39.35	6.96
	(56.59)	
NFNW [$10,000]	625.85**	110.73
	(237.93)	
ALLOTHINC [$10,000]	1,224.23**	216.60
	(584.65)	
IGFI [$10,000]	-337.87	-59.78
	(285.11)	
IGFI2 [$10,000^2]	0.04	0.007
	(0.05)	
MILES	-607.73*	-107.53
	(315.65)	
BEG1	101,750.03**	18,002.62
	(49,350.39)	
σ	139,094.30	

Note: 10% and 5% statistical significance is represented by * and **, respectively.
Numbers in parentheses represent the standard errors.
Numbers in brackets represent the variables scale.
σ is the estimated scale factor.

For each additional $10,000 of *NFNW*, an average of $111 of non-farm business income is expected. *NFNW* has a much larger impact than *FNW* on non-farm business income which may indicate these farm households have a more diversified portfolio of investments. On average, approximately 2 percent of household income comes from the non-farm business. This is based on the marginal effect of an additional $10,000 of *ALLOTHINC* being equal to $217. Thus, the primary source of income for these farm households comes from other income sources rather than the non-farm business. Although statistical significance is not noted on *IGFI* and *IGFI2*, the signs conform to expectations or there may be a point in which human capital may best be applied elsewhere. More rural farm households have lower non-farm business income. For each mile a farm household is removed from a town of 10,000, non-farm business income decreases, on average, $108. Finally, farming operators with just 1 year of experience have a significant impact on non-farm business income. Assuming the average marginal effect of $18,003 is low, new farm entrants with a non-farm business are not operating large non-farm business (at least in terms of income).

This concludes the discussion on the differences of households with and without non-farm business income. The following sections move down the data discussion tree outlined in figure 1.

Young Farm Households Who Reported Having Non-Farm Business Income

Since operators of farm households who are considered young (< 35 years old) represent such a small portion of the entire population of U.S. farm households, only the 2003/2004 combined years may be used for statistical analysis. Table 4 presents these results.

Only 6% of those households with non-farm business income were considered young farmers. Non-farm business income, net farm income, total off farm income, and the percent of value production (remember that this value of production is not for the aggregate U.S. – it is only for those with non-farm business income) is higher for households who are not considered young. Also, net farm income for households with non-farm business income is measured with a lot of error or the C.V. is way too high for reliability. A reason why all income measures for young farm households with non-farm business income are significantly lower is because these households are starting their 'careers.' Thus, they are on the lower end of the income curve over their respective lifetime.

The financial characteristics also resemble where each group is on their respective life cycle. For example; young farm households have a lower amount of assets and a higher debt-to-asset ratio relative to their older counterparts. These results are in line with the life cycle hypothesis, which is similar to the income characteristics results. The means between non-farm assets and non-farm net worth for both groups are statistically significant. Potentially these young farm households are starting their non-farm business and have not had the opportunity to expand their business in terms of market share (i.e. building brand name awareness).

Table 4. 2003 and 2004 combined ARMS Data of Farm Households Who Have Non-Farm Business Income - Young Farmer (< 35 years old) and Not a Young Farmer (> 35 years old)

	Not a Young Farmer		Yes a Young Farmer		
Income Characteristics	Mean	C.V.	Mean	C.V.	T-Statistic
Non-Farm Business Income	$54,092	8.26%	$37,748	23.83%	-1.63
Net Farm Income	$11,551	20.18%	-$2,594	416.30%	-1.28
Total Off Farm Income	$114,819	5.17%	$68,507	18.52%	-3.31
Gross Farm Sales	$87,708	30.50%	$63,055	37.73%	-0.69
Percent Value of Production	96.09%		3.91%		
Financial Characteristics					
Farm Assets	$634,836	35.59%	$362,553	27.21%	-1.10
Non-Farm Assets	$445,797	4.71%	$188,517	43.67%	-3.03
Farm Net Worth	$580,760	37.79%	$312,700	30.36%	-1.12
Non-Farm Net Worth	$365,271	5.00%	$122,794	31.86%	-5.62
Debt-to-Asset Ratio	14.56%	6.99%	25.16%	45.13%	0.93
Household Characteristics					
Household Expenditures	$44,476	3.02%	$36,136	12.04%	-1.83
Household Size	2.77	2.23%	2.89	18.00%	0.23
Operator Farm Hours	1,334	4.05%	1,909	37.84%	0.79
Spouse Farm Hours	374	8.63%	178	114.75%	-0.95
Operator Off Farm Hours	1,456	6.58%	1,843	9.89%	1.88
Spouse Off Farm Hours	1,007	6.01%	597	66.79%	-1.02
Operator/Farm Characteristics					
Operator Age	55.93	0.89%	30.04	4.71%	-17.26
Beginning Farmer	37.11%		89.55%		
Farmer Tenure	18.99	3.48%	6.64	13.69%	-10.98
Gross Farm Sales					
< $10,000	30.50%		54.94%		
> $10,000 and < $100,000	54.76%		32.59%		
> $100,000 and < $250,000	8.03%		4.62%		
> $250,000	6.71%		7.85%		
Primary Occupation is Farming	34.31%		15.39%		
Percent of Owned Acres	79.08%	1.98%	82.99%	10.97%	0.42
College Degree = 1	23.81%		11.49%		
Loan Characteristics					
Percent Who…					
Have a Farm Loan	42.42%		45.95%		
Have a Farm Non-Real Estate Loan	15.52%		21.86%		
Have a Farm Real Estate Loan	27.22%		25.66%		
Have a Farm Short Term Loan	11.97%		7.11%		
Percent Who…					
Have a Non-Farm Home Loan	12.30%		12.67%		
Have an Other Mortgage Loan	9.50%		10.60%		
Have a Non-Farm Business Loan	17.45%		16.86%		
Have a Non-Farm Personal Loan	34.29%		29.24%		
Representative Number of Farms	649,657		42,806		
Sample Size	1,921		94		

Household expenditures are higher for older farm households and this result is statistically significant. This result may be impacted by older farm households having more disposable income. Numerous empirical studies would support this assertion. The spouse does not take as active role working on or off the farm, on average, for young farm households. However, the spouse takes a more active role in households whose operator is older than 35. Although the spouse may not be working in the sense of reported labor for young farm households, the operator, on average, is working nearly full time on and off the farm.

Young farm households have less farming experience and a large portion of them would be considered beginning farmers, 90%. This is not surprising given these farm household operators are less than 35 years old. The distribution of these two groups across farm sales categories is nearly identical except for those farm households whose farm sales are less than $100,000. A larger proportion of young farm households with non-farm business income have less than $10,000 of gross farm sales, 55% compared to 30%. However, older and young farm households each have approximately 85% of their respective sample falling in the less than $100,000 gross farm sales category. The primary occupation being farming is more prevalent for operators who are older than 35 – 34.31% compared to 15.39%. Finally, the loan characteristics for these two groups are nearly identical.

Beginning Farm Households Who Reported Having Non-Farm Business Income

The next sub-group within those who reported having non-farm business income are beginning farmers or those with less than 10 years of farming experience. Table 5 presents the results that compare beginning farm households to their more experienced counterparts.

Approximately, 40% of those households with non-farm business income are considered beginning farmers or a representative total of 174,914 farm households. Although not statistically significant, the mean of non-farm business income, net farm income, total off farm income, gross farm sales, and the percent of value of production for beginning farmers is lower than households with more than 10 years of farming experience.

Farm and non-farm wealth measures (assets and net worth) are all lower for beginning farmers. It should be noted that the farm assets and farm net worth means are both measured with a significant amount of error (i.e. their coefficient of variation is around 75%). Therefore, these numbers should be analyzed with caution. Beginning farmers also have a higher, but not statistically significant, debt-to-asset ratio.

Household expenditures, gross farm sales, and farm and off farm labor hours are all approximately equal for beginning farmers and farmers with more than 10 years of farming experience. A larger portion of young farmers (< 35 years old) fall in the beginning classification. This result was stated earlier in the young farm household section.

Approximately 95% of beginning farmers, who have non-farm business income, have less than $250,000 gross farm sales in 2004. In other words, these particular beginning farms are considered to be small (< $250,000 gross farm sales) whereas a larger proportion of older farm households with non-farm business income have a larger amount of gross farm sales. In 2004, nearly 50% of beginning farms reported their primary occupation is farming. However, beginning farms own a larger percentage of their total acreage base. This result is contrary to what was argued earlier regarding the high land values causing farmers to lease/rent as opposed to owning their farmed acres. This may be due to them starting in farming and have not had the opportunity to enter into lease/rental agreements.

Table 5. 2004 ARMS Data for Farm Households Who Have Non-Farm Business Income - Beginning Farmers

	Not Beginning		Yes Beginning		
Income Characteristics	Mean	C.V.	Mean	C.V.	T-Statistic
Non-Farm Business Income	$55,145	16.19%	$41,587	18.10%	-1.16
Net Farm Income	$23,848	14.83%	$10,750	65.65%	-1.66
Total Off Farm Income	$120,169	10.05%	$96,177	13.29%	-1.36
Gross Farm Sales	$124,479	52.30%	$77,089	22.96%	-0.70
Percent Value of Production	70.19%		29.81%		
Financial Characteristics					
Farm Assets	$794,414	73.40%	$463,801	16.74%	-0.56
Non-Farm Assets	$431,542	9.20%	$367,033	10.52%	-1.16
Farm Net Worth	$736,277	76.74%	$424,181	13.18%	-0.55
Non-Farm Net Worth	$364,582	9.79%	$291,654	11.63%	-1.48
Debt-to-Asset Ratio	12.23%	5.69%	16.08%	17.46%	1.33
Household Characteristics					
Household Expenditures	$43,321	6.20%	$41,865	8.80%	-0.32
Household Size	2.67	6.36%	2.81	5.22%	0.62
Operator Farm Hours	1,592	7.26%	1,268	10.86%	-1.80
Spouse Farm Hours	380	12.41%	440	20.92%	0.58
Operator Off Farm Hours	1,310	5.45%	1,570	8.29%	1.29
Spouse Off Farm Hours	1,079	9.17%	1,045	9.55%	-0.17
Operator/Farm Characteristics					
Operator Age	57.57	1.87%	52.20	3.45%	-2.55
Young Farmer (< 35 years old)	0.97%		6.30%		
Farmer Tenure	28.65	2.58%	2.95	20.19%	-27.09
Gross Farm Sales					
< $10,000	22.45%		39.19%		
> $10,000 and < $100,000	57.25%		50.71%		
> $100,000 and < $250,000	10.33%		4.67%		
> $250,000	9.97%		5.42%		
Farming Primary Occupation	33.11%		49.10%		
Percent of Owned Acres	73.15%	4.75%	82.92%	3.15%	2.25
College Degree = 1	29.79%		16.35%		
Loan Characteristics					
Percent Who…					
Have a Farm Loan	40.46%		29.33%		
Have a Farm Non-Real Estate Loan	18.97%		14.87%		
Have a Farm Real Estate Loan	29.29%		20.92%		
Have a Farm Short Term Loan	14.91%		11.79%		
Percent Who…					
Have a Non-Farm Home Loan	9.88%		4.06%		
Have an Other Mortgage Loan	9.94%		5.51%		
Have a Non-Farm Business Loan	21.45%		17.49%		
Have a Non-Farm Personal Loan	39.47%		27.11%		
Representative Number of Farms	248,964		174,914		
Sample Size	923		446		

Finally, a lower percentage of beginning farms with non-farm business income have a farm loan relative to their older counterparts. However, both groups largest percentage of farm loans is in real estate. It is also interesting that more experienced farms have a higher percentage of non-farm business loans. These results suggest that beginning farms with non-farm business income either do not meet farm or non-farm credit standards, have access to farm or non-farm credit, or simply do not demand credit. Further analysis is necessary to look at the farm and non-farm credit demand and credit supply issues.

Farm Households Who Reported Having Non-Farm Business Income by Sales Classifications

The next sub-group within those who reported non-farm business income is based on sales classification. The sales less than $10,000 group is combined with those households between $10,000 and $100,000 to form one group having less than $100,000 sales. The reasoning is because these two groups do not statistically differ relative to total household income, total off farm income, farm income, non-farm business income, and household expenditures. Table 6 contains the results for this classification method of those who have non-farm business income in the 2004 ARMS data set.

Before discussing the results in table 6, there is an interesting contrast between the 2003 and 2004 data that is worth mentioning. In 2003, farms with > $250,000 sales had the highest non-farm business income relative to the other groups. However, the opposite is true in 2004. In 2004, farms with > $250,000 sales had the lowest amount of non-farm business income relative to all other groups. This lends support to the way non-farm business income is asked then calculated for 2004 being more reliable. In other words, it seems more logical that higher sales farms would have lower non-farm business income because of the investment and time allocation necessary for a farm with > $250,000 gross farm sales would be greater than their small counterparts or farms with < $250,000 gross farm sales.

Non-farm business income and total off farm income for the lowest sales classification considered, < $100,000 sales group, are both higher and statistically significant relative to farm households in higher sales classification groups. Also, non-farm business income comprises a large percentage of total household income for the < $100,000 sales group or approximately 43% of total household income comes from non-farm business income. This is interesting because this percentage declines as gross farm sales increase. In other words, non-farm business income comprises 32% and 17% of total household income for the > $100,000 & < $250,000 sales group and the > $250,000 sales group, respectively. A reason that the relative importance of non-farm business income decreases as gross farm sales increases is because larger farms have a significantly higher amount of net farm income and gross farm sales. In 2004, the average gross farm sales for the > $250,000 sales group was nearly $1,000,000 and net farm income for this group was $145,958. For these very large farm households, income from the farm alone exceeded the total household income of the other two groups considered in table 6.

Not surprisingly, farm and non-farm wealth, assets and net worth, only increase as the sales classification increases. The < $100,000 farm sales group has significantly lower average total household expenditures compared to the other two groups. This result may be due to smaller gross farm sales households having a lower amount of total household income. The labor hour allocation by the operator and spouse relative to each sales group makes sense relative to their income sources. In other words, lower farm sales groups spend a majority of their time off the farm (operator and spouse) because the proportion of their total household income comes from off farm sources.

Table 6. 2004 ARMS Data for Farm Households Who Have Non-Farm Business Income - Sales Classification

	< $100K		> $100K and < $250K		> $250K	
Income Characteristics	Mean	C.V.	Mean	C.V.	Mean	C.V.
Non-Farm Business Income	$51,100	11.94%	$44,482	21.94%	$38,486	43.79%
Net Farm Income	$3,887	46.34%	$42,132	23.77%	$145,958	35.41%
Total Off Farm Income	$114,248	7.07%	$97,209	14.93%	$81,909	39.49%
Gross Farm Sales	$19,524	7.48%	$166,844	5.70%	$929,136	19.34%
Percent Value of Production	11.93%		16.53%		71.53%	
Financial Characteristics						
Farm Assets	$452,085	7.30%	$1,238,439	18.75%	$2,219,394	111.66%
Non-Farm Assets	$390,643	7.17%	$380,899	30.73%	$576,682	26.20%
Farm Net Worth	$426,430	7.71%	$1,120,784	19.83%	$1,977,690	125.48%
Non-Farm Net Worth	$320,896	9.41%	$333,176	37.02%	$476,696	27.07%
Debt-to-Asset Ratio	13.29%	10.64%	15.33%	22.36%	17.78%	42.37%
Household Characteristics						
Household Expenditures	$40,870	4.69%	$47,758	12.65%	$56,920	20.00%
Household Size	2.68	4.20%	2.76	5.08%	3.14	14.00%
Operator Farm Hours	1,183	8.16%	2,605	4.63%	3,181	17.67%
Spouse Farm Hours	369	14.73%	592	30.17%	587	27.79%
Operator Off Farm Hours	1,563	4.59%	848	18.74%	466	89.91%
Spouse Off Farm Hours	1,055	7.80%	1,371	10.66%	873	31.48%
Operator/Farm Characteristics						
Operator Age	55.71	1.78%	54.75	2.85%	52.25	8.76%
Young Farmer (< 35 years old)	3.07%		1.93%		5.40%	
Farmer Tenure	17.43	5.94%	21.71	9.36%	20.74	13.93%
Beginning Farmer	44.21%		24.11%		27.65%	
Farming Primary Occupation	31.17%		73.49%		94.85%	
Percent of Owned Acres	81.34%	2.12%	57.20%	19.51%	53.78%	21.80%
College Degree = 1	22.13%		32.88%		37.68%	
Loan Characteristics						
Percent Who…						
Have a Farm Loan	29.56%		68.63%		68.90%	
Have a Farm Non-Real Estate Loan	13.78%		23.21%		47.69%	
Have a Farm Real Estate Loan	20.97%		55.50%		47.01%	
Have a Farm Short Term Loan	9.58%		29.51%		39.78%	
Percent Who…						
Have a Non-Farm Home Loan	6.67%		10.44%		12.93%	
Have an Other Mortgage Loan	8.01%		8.42%		8.86%	
Have a Non-Farm Business Loan	20.59%		16.82%		14.82%	
Have a Non-Farm Personal Loan	35.43%		29.83%		27.85%	
Representative Number of Farms	355,688		33,881		34,309	
Sample Size	631		250		488	

Operators in the < $250,000 farm sales group are older on average and interestingly the largest percentage of young farmers is found in the largest sales classification category. Potentially, these young households are second or multiple generation farmers who have diversified their income through a non-farm business.

Operators in the < $100,000 have less farming experience or farming tenure, have a lower percentage of reporting their primary occupation is farming, own more of their total acres, and are less educated.

The < $100,000 sales group has the lowest percentage of having a farm loan but they also have the highest percentage of having a non-farm business loan relative to the other groups. The > $250,000 sales group considered in table 6 use a wide array of farm loan products. In other words, their loan demands are not primarily in real estate as it is with the other two groups.

Farm Households Who Reported Having Non-Farm Business Income – Beginning Farmers with <$250,000 Gross Farm Sales

Table 7 shows the descriptive results from segmenting the data by farm households with non-farm business income that are beginning farmers, and < $250,000 gross farm sales (i.e. small farms). This segmentation is discussed because a majority of beginning farmers is considered to be small (94.6%). For the most part, all results are very similar to the beginning farmer segmentation discussed above. However, some differences are noted.

Per table 7, non-farm business income is 45.1% of total household income compared to 38.9% for all beginning farmers, including the 5.4% that have more than $250,000 gross farm sales. Thus, non-farm business income constitutes a larger portion of total household income. This is partly due to table 7 showing a small amount of net farm income ($3,720) and gross farm sales ($20,350).

Farm assets and farm net worth are lower while non-farm assets and non-farm net worth are higher, on average, for beginning and small farmers with non-farm business income compared to all beginning farmers. This result is largely due to the data being limited to small farms. On average, beginning and small farms have a portfolio of assets that are equally dispersed across farm and non-farm investments. These new farm operators enter farming with a sizable amount of non-farm assets.

Farm Households Who Reported Having Non-Farm Business Income – Farming Primary Occupation versus Primary Occupation is Not Farming

The next sub-group within those who reported non-farm business income is farmers who reported their primary occupation being farming. Table 8 contains the results for those whose primary occupation is farming versus those whose primary occupation is not farming for 2004.

Farmers, whose primary occupation is not farming, hereafter referred to as not farming operators, have a higher and statistically significant amount of non-farm business income and total off farm income. Net farm income, gross farm sales, and percent of value of production is higher and statistically significant for farmers whose primary occupation is farming, hereafter referred to as farming operators. Financial characteristics resemble the same story or not farming operators have more non-farm assets and farm net worth and farming operators have more farm assets and farm net worth.

Not farming operators have average household expenditures that are higher and statistically significant relative to farming operators. Also, household size for farming operators is higher and the hour allocation by the household relates directly to the income discussion above (i.e. not farming operators have a higher off farm labor because of their larger amount of total off farm income). Farming experience for farming operators is lower than that of those who are not farming operators. This result may be influenced by the not farming operators predominately lying in the lower sales classifications relative to farming operators. Not farming operators own more of their acres relative to farming operators, which is not surprising given high land values.

Table 7. 2004 ARMS Data for Farm Households Who Have Non-Farm Business Income - Beginning Farmers with < $250,000 Gross Farm Sales

Income Characteristics	Mean	Standard Error	25th Percentile	50th Percentile	75th Percentile
Non-Farm Business Income	$42,190	$5,900	$7,450	$7,450	$69,369
Net Farm Income	$3,720	$2,435	-$4,805	$300	$3,738
Total Off Farm Income	$97,232	$9,895	$23,145	$56,538	$140,000
Gross Farm Sales	$20,350	$2,633	$5,560	$11,787	$20,838
Financial Characteristics					
Farm Assets	$388,825	$43,492	$132,973	$213,120	$430,850
Non-Farm Assets	$384,027	$41,622	$147,885	$211,772	$393,445
Farm Net Worth	$361,399	$44,150	$107,971	$195,494	$385,200
Non-Farm Net Worth	$304,896	$44,248	$101,444	$169,514	$325,582
Debt-to-Asset Ratio	16.00%	4.00%	5.00%	13.00%	21.00%
Household Characteristics					
Household Expenditures	$41,661	$3,902	$27,887	$31,093	$47,000
Household Size	2.78	0.15	2.00	3.00	3.00
Operator Farm Hours	1,162.83	130.24	364.00	806.00	1,820.00
Spouse Farm Hours	432.98	97.15	0.00	0.00	572.00
Operator Off Farm Hours	1,625.75	122.97	0.00	2,000.00	2,500.00
Spouse Off Farm Hours	1,068.68	98.57	0.00	800.00	2,000.00
Operator/Farm Characteristics					
Operator Age	52.32	1.53	47.00	55.00	55.00
Young Farmer (< 35 years old)	6.00%				
Farmer Tenure	2.98	0.42	0.00	1.00	6.00
Farming Primary Occupation	47.00%				
Percent of Owned Acres	85.00%	2.00%	96.00%	100.00%	100.00%
Operator with a College Degree	16.00%				
Loan Characteristics					
Percent Who…					
Have a Farm Loan	27.00%				
Have a Farm Non-Real Estate Loan	13.00%				
Have a Farm Real Estate Loan	19.00%				
Have a Farm Short Term Loan	10.00%				
Percent Who…					
Have a Non-Farm Home Loan	7.00%				
Have an Other Mortgage Loan	5.00%				
Have a Non-Farm Business Loan	18.00%				
Have a Non-Farm Personal Loan	28.00%				
Representative Number of Farms	165,428				
Sample Size	306.00				

Farming operators have a higher percentage of having a farm loan but not farming operators do have farm loans. Also, not farming operators have a higher percentage of having a non-farm business loan but farming operators do have non-farm business loans (but this is very low, around 8% in 2004).

Table 8. 2004 ARMS Data for Farm Households Who Have Non-Farm Business Income - Farming Primary Occupation

	Not a Farmer		Yes a Farmer		
Income Characteristics	Mean	C.V.	Mean	C.V.	T-Statistic
Non-Farm Business Income	$60,797	13.95%	$32,473	17.98%	-2.75
Net Farm Income	$6,625	68.09%	$36,387	16.75%	3.92
Total Off Farm Income	$137,985	8.07%	$68,184	12.72%	-4.95
Gross Farm Sales	$28,945	95.61%	$220,289	28.40%	2.80
Percent Value of Production	15.78%		84.22%		
Financial Characteristics					
Farm Assets	$504,268	13.10%	$891,391	88.44%	0.49
Non-Farm Assets	$472,183	6.26%	$302,793	11.91%	-3.63
Farm Net Worth	$472,264	8.32%	$812,817	96.58%	0.43
Non-Farm Net Worth	$385,032	8.46%	$257,742	14.51%	-2.57
Debt-to-Asset Ratio	13.53%	18.05%	14.25%	6.78%	0.27
Household Characteristics					
Household Expenditures	$45,932	4.28%	$37,843	6.18%	-2.65
Household Size	2.60	7.91%	2.92	5.36%	1.25
Operator Farm Hours	997	6.24%	2,159	5.55%	8.60
Spouse Farm Hours	326	17.01%	525	14.43%	2.12
Operator Off Farm Hours	750	13.43%	1,857	4.23%	-0.42
Spouse Off Farm Hours	865	11.66%	1,197	7.88%	-0.16
Operator/Farm Characteristics					
Operator Age	55.43	3.24%	55.24	1.26%	-0.10
Young Farmer (< 35 years old)	3.56%		2.58%		
Farmer Tenure	19.86	5.74%	15.28	10.48%	-2.34
Gross Farm Sales					
< $10,000	35.29%		20.35%		
> $10,000 and < $100,000	60.50%		45.52%		
> $100,000 and < $250,000	3.51%		14.79%		
> $250,000	0.69%		19.33%		
Beginning Farmer	34.84%		51.02%		
Percent of Owned Acres	80.71%	4.07%	71.81%	4.20%	-2.00
College Degree = 1	28.43%		17.90%		
Loan Characteristics					
Percent Who…					
Have a Farm Loan	31.97%		41.79%		
Have a Farm Non-Real Estate Loan	14.30%		21.80%		
Have a Farm Real Estate Loan	23.15%		29.91%		
Have a Farm Short Term Loan	9.86%		19.33%		
Percent Who…					
Have a Non-Farm Home Loan	9.89%		3.81%		
Have an Other Mortgage Loan	11.13%		3.52%		
Have a Non-Farm Business Loan	27.52%		8.13%		
Have a Non-Farm Personal Loan	43.61%		20.34%		
Representative Number of Farms	255,566		168,312		
Sample Size	520		849		

Farm Households Who Reported Having Non-Farm Business Income – Collapsed ERS Farm Typology

The next sub-group within those who reported non-farm business income is the Collapsed ERS Farm Typology. The Collapsed ERS Farm Typology combines the expanded ERS Farm Typology groups Limited Resource Farms (< $20,000 total household income), Retirement (operator reports being retired), and Rural Residential (operator's primary occupation is something other than farming) farms into the Rural Residential group; Farmer Occupation/Small (operator's primary occupation is farming and have less than $100,000 gross farm sales) and Farmer Occupation/Large (operator's primary occupation is farming and have more than $100,000 and less than $250,000 gross farm sales) make up the Intermediate Farm group; Large (operator's primary occupation is farming but have more than $250,000 and less than $500,000 gross farm sales) and Very Large (operator's primary occupation is farming and have more than $500,000 gross farm sales) comprise the Commercial Farm group. Table 9 contains the results for the collapsed ERS Farm Typology who reported having non-farm business income in 2004.

Rural Residential farms have a higher total off farm income, not surprising given their definition. However the percentage of non-farm business income relative to total off farm income is the lowest relative to the other two groups. In other words, the non-farm business income is not as significant to total off farm income for *Rural Residential* farms as compared to *Intermediate Farms* and *Commercial Farms*. Net farm income and gross farm sales are the highest for *Commercial Farms*, which is to be expected since these farms all have over $250,000 gross farm sales.

Farm and non-farm wealth is the highest for *Commercial Farms* but *Rural Residential Farms'* wealth, farm and non-farm, exceeds intermediate farms. *Commercial Farms* have the highest debt-to-asset ratio, household expenditures, and household size. The labor hours are reflective of the group definition (e.g. *Rural Residential Farms* primarily work off the farm). *Intermediate Farms* are the youngest and had the least amount of farming experience. *Rural Residential Farms* own the largest percentage of their acres and *Commercial Farms* own the least. The results of those who have farm loans and non-farm loans are essentially the same as those discussed in the sales classification or table 5. This is because the collapsed ERS Farm Typology is largely defined by gross farm sales. Finally, the largest percentage of farms is *Rural Residential* farms.

Farm Households Who Reported Having Non-Farm Business Income – U.S. Farm Household Typology

The final classification system considered of those farm households who reported having non-farm business income is the U.S. Farm Household Typology. These results are presented in table 10 for the combined 2003 and 2004 ARMS data set. The combined data set is necessary because of low sampling issues.

The U.S. Farm Household Typology is based on Briggeman's dissertation. This typology is based on household economic theory and therefore considers the resource allocation decisions of the entire farm household (e.g. labor, investments, credit, and consumption). The six mutually exclusive groups are: Single Income Ruralpolitan (*SIR*), Double Income Ruralpolitan (*DIR*), Active Seniors (*AS*), Farm Operator with Spouse Working Off Farm (*FOSO*), Traditional Farms (*TRAD*), and Commercial Farms (*COM*). *SIR* and *DIR* operators primarily work off the farm. Spouses also work off the farm for *DIR*. Operators in the *AS* group are the oldest among all groups and they still work on the farm. The next group, *FOSO*, has the operator working on the farm and spouse working off the farm. Both operator and spouse work on the farm for *TRAD*. *COM* has the largest value of farm assets with the operator working on the farm. These six groups comprise the U.S. Farm Household Typology.

Table 9. 2004 ARMS Data for Farm Households Who Have Non-Farm Business Income - Collapsed ERS Farm Typology

	Rural Residence		Intermediate Farm		Commercial Farm	
Income Characteristics	Mean	C.V.	Mean	C.V.	Mean	C.V.
Non-Farm Business Income	$59,539	13.30%	$32,788	19.86%	$40,030	42.97%
Net Farm Income	$5,713	38.46%	$10,373	51.96%	$148,629	36.71%
Total Off Farm Income	$134,243	7.25%	$69,462	13.21%	$89,734	35.07%
Gross Farm Sales	$23,130	7.06%	$59,601	12.13%	$915,228	21.82%
Percent Value of Production	9.05%		14.43%		76.52%	
Financial Characteristics						
Farm Assets	$495,018	6.24%	$583,765	12.97%	$2,207,950	114.41%
Non-Farm Assets	$462,160	6.86%	$258,100	16.53%	$554,039	26.07%
Farm Net Worth	$464,806	6.79%	$542,606	13.09%	$1,964,140	128.77%
Non-Farm Net Worth	$378,031	9.28%	$221,364	19.37%	$453,665	27.53%
Debt-to-Asset Ratio	13.65%	13.38%	13.17%	7.83%	17.69%	42.31%
Household Characteristics						
Household Expenditures	$44,973	4.43%	$35,130	6.00%	$55,854	22.15%
Household Size	2.66	5.95%	2.74	3.20%	3.18	13.15%
Operator Farm Hours	1,007	6.54%	1,933	7.24%	3,021	16.32%
Spouse Farm Hours	320	16.35%	515	19.00%	615	27.78%
Operator Off Farm Hours	1,849	5.06%	805	12.01%	558	66.90%
Spouse Off Farm Hours	1,187	8.78%	871	14.13%	909	30.13%
Operator/Farm Characteristics						
Operator Age	55.37	2.53%	56.07	1.24%	52.38	8.95%
Young Farmer (< 35 years old)	3.54%		2.58%		2.75%	
Farmer Tenure	19.79	5.95%	14.05	12.41%	20.63	14.56%
Beginning Farmer	35.02%		57.00%		26.15%	
Gross Farm Sales						
< $10,000	35.16%		25.58%		0.00%	
> $10,000 and < $100,000	61.40%		53.76%		0.00%	
> $100,000 and < $250,000	3.30%		16.95%		0.00%	
> $250,000	0.15%		3.71%		100.00%	
Farming Primary Occupation	1.21%		100.00%		93.67%	
Percent of Owned Acres	80.73%	3.20%	76.17%	4.48%	53.98%	21.94%
College Degree = 1	28.46%		13.47%		35.08%	
Loan Characteristics						
Percent Who…						
Have a Farm Loan	31.83%		35.32%		69.05%	
Have a Farm Non-Real Estate Loan	14.01%		17.31%		42.28%	
Have a Farm Real Estate Loan	23.19%		25.23%		48.64%	
Have a Farm Short Term Loan	9.59%		14.23%		42.14%	
Percent Who…						
Have a Non-Farm Home Loan	9.73%		1.70%		13.27%	
Have an Other Mortgage Loan	10.95%		2.47%		8.94%	
Have a Non-Farm Business Loan	27.09%		7.48%		13.48%	
Have a Non-Farm Personal Loan	43.10%		19.85%		25.49%	
Representative Number of Farms	256,560		133,929		33,389	
Sample Size	458		368		543	

Table 10. 2003 and 2004 Combined ARMS Data for Farm Households Who Have Non-Farm Business Income - U.S. Farm Household Typology

	Single Income Ruralpolitan		Double Income Ruralpolitan		Active Seniors		Farm Operator with Spouse Working Off Farm		Traditional Farms		Commercial Farms	
Income Characteristics	Mean	C.V.	Mean	C.V.	Mean	C.V.	Mean	C.V.	Mean	C.V.	Mean	C.V.
Non-Farm Business Income	$104,674	17.78%	$46,072	8.23%	$21,872	12.28%	$72,578	43.31%	$43,775	13.83%	$100,330	29.98%
Net Farm Income	RC	RC	$2,162	73.93%	RC	RC	$26,551	41.37%	$33,915	47.78%	$50,897	25.16%
Total Off Farm Income	$122,422	16.08%	$117,467	4.90%	$42,728	9.25%	$131,139	23.32%	$85,048	12.46%	$192,096	19.78%
Gross Farm Sales	$27,468	71.26%	$32,648	11.37%	$52,951	96.60%	$175,731	55.35%	$213,298	26.19%	$314,115	18.44%
Financial Characteristics												
Farm Assets	$422,371	19.27%	$430,058	7.54%	RC	RC	$771,377	26.63%	$1,047,260	11.78%	$1,746,962	11.76%
Non-Farm Assets	$422,270	11.69%	$422,764	6.44%	$197,704	11.66%	$376,893	16.08%	$302,679	28.08%	$1,271,899	13.31%
Farm Net Worth	$381,839	13.14%	$389,887	7.73%	RC	RC	$675,241	24.85%	$925,812	12.01%	$1,633,888	12.16%
Non-Farm Net Worth	$343,729	10.71%	$335,218	7.30%	$165,733	13.74%	$314,903	18.01%	$231,464	38.81%	$1,057,020	17.16%
Debt-to-Asset Ratio	17.00%	23.53%	18.00%	11.11%	9.00%	11.11%	16.00%	12.50%	17.00%	29.41%	12.00%	16.67%
Household Characteristics												
Household Expenditures	$42,353	6.95%	$47,155	4.58%	$27,191	5.36%	$46,931	12.38%	$43,503	6.29%	$63,384	11.99%
Household Size	2.70	5.93%	2.95	4.41%	2.33	4.29%	2.97	8.42%	3.03	6.27%	2.66	6.77%
Operator Farm Hours	1,058	21.46%	1,022	6.72%	1,309	10.14%	2,265	4.10%	2,681	4.01%	1,731	8.68%
Spouse Farm Hours	98	22.21%	404	12.46%	51	28.34%	282	11.51%	1,973	8.45%	152	21.50%
Operator Off Farm Hours	2,257	2.79%	2,280	1.91%	99	27.34%	215	52.12%	331	34.82%	651	20.16%
Spouse Off Farm Hours	72	35.26%	2,077	3.07%	40	44.92%	2,149	3.85%	217	62.49%	288	20.60%
Operator/Farm Characteristics												
Operator Age	51.21	4.75%	51.05	1.94%	62.28	2.57%	55.05	2.54%	56.41	2.25%	59.53	1.76%
Young Farmer (< 35 years old)	14%		6%		4%		1%		2%		1%	
Farmer Tenure	15.85	10.91%	15.08	6.03%	22.34	13.47%	21.38	9.12%	22.29	6.55%	23.27	7.13%
Beginning Farmer	51%		45%		43%		25%		26%		20%	
Farming Primary Occupation	18%		12%		51%		74%		71%		47%	
Percent of Owned Acres	83%	4.82%	81%	2.47%	79%	5.06%	65%	12.31%	77%	6.49%	81%	3.70%
College Degree = 1	20%		24%		12%		23%		22%		51%	
Loan Characteristics												
Percent Who…												
Have a Farm Loan	32%		38%		18%		51%		55%		42%	
Have a Farm Non-Real Estate Loan	10%		17%		11%		23%		24%		22%	
Have a Farm Real Estate Loan	23%		29%		11%		38%		46%		31%	
Have a Farm Short Term Loan	8%		10%		7%		21%		23%		14%	
Percent Who…												
Have a Non-Farm Home Loan	10%		21%		4%		19%		12%		28%	
Have an Other Mortgage Loan	10%		11%		1%		10%		7%		21%	
Have a Non-Farm Business Loan	18%		24%		7%		13%		11%		20%	
Have a Non-Farm Personal Loan	32%		45%		16%		41%		25%		28%	
Representative Number of Farms	158,363		248,475		108,020		70,135		51,443		56,027	
Sample Size	306		475		257		317		317		343	

Unfortunately, some results cannot be reported because of reliability concerns given that the coefficient of variation is too high (> 200%). Non-farm business income represents at least 50% of total off farm income for all groups except *DIR*. *SIR* have the largest average non-farm business income ($104,674) with *COM* not that far behind ($100,330). The *COM* farms who reported having non-farm business income are very wealthy. The *COM* average farm and non-farm worth exceeds all other groups in table 10 and the average total net worth for *COM* farms is nearly $3,000,000. Even though *SIR* has the highest average non-farm business income, their non-farm net worth is relatively low compared to *COM* farms. This may be due in part to a majority of this net worth being in the non-farm business.

The labor hours coincide with the definitions of each group. A large amount of *SIR*s are considered young farmers, 14%. Also, a large portion of ruralpolitans are beginning farmers, which coincides with these two groups having the lowest average years of farm experience. *TRAD* and *FOSO* have the largest percentage of households who have a farm loan, which is predominately in real estate however they do have other farm loans. Similar to the life cycle hypothesis, very few *AS* have a farm loan since this group, on average, consists of older operators or nearing retirement. *COM*'s have the highest percentage of having a non-farm loan for all groups except for personal loans (i.e. credit cards).

Number of Loans and the Purpose of those Loans by Lender for Farm Households with Non-Farm Business Income

In the 2004 ARMS data, respondents are asked detailed questions regarding their outstanding loans as of December 31, 2004. Table 11 shows those farm households with non-farm business income that reported having a loan, the purpose of said loan, and the lender that provided the loan. In addition, the percentages of loans with a guarantee are provided. A total of 146,867 loans were reported and a loan purpose was provided. This is smaller than all reported loans with or without a loan purpose, 212,900. The largest amounts of reported loans, with or without a loan purpose, are with commercial banks (119,861 or 56.3% of all reported loans). Farm Credit Services (FCS) has the second largest amount (33,208 or 15.6% of all reported loans). These two results are consistent for reported loans with a loan purpose. From this point forward, the discussion will focus on reported loans with a reported loan purpose.

For the entire sample, the primary loan purpose is for purchasing land, machinery, etc. (58.9%). This result is consistent across all lenders considered. Commercial banks have a larger 'variety' of loan purposes than any other lender considered. Note that suppliers refer to input suppliers, machinery dealerships, cooperatives, etc. Also, the Farm Service Agency (FSA) provided the most guarantees on loans (6.1%). Unfortunately, segmenting the data by young, beginning, and/or small to further analyze loan purposes presents reliability concerns and cannot be reported.

To this point, the discussion has focused on the ARMS data set and what it provides regarding farm households that generate income from a non-farm business. In order to fulfill all of the objectives of Phase II of this research, additional data sets and sources are necessary. Also, the focus of non-farm businesses is broadened to capture all small businesses. Therefore, the following discussion focuses on the small business lending environment or the final piece of Phase II of this research. More specifically, who is lending to these businesses, loan policy and procedures with small businesses, and unique challenges and opportunities faced by lenders in providing loan services to small businesses. In short, the focus is on lessons learned from the commercial banking industry lending to small businesses.

Lending to Small Businesses: Challenges and Opportunities

Small businesses are pervasive in almost all segments of the U.S. economy, and in recent years they have been critical to job creation and economic growth in many communities as well as in the U.S. as a whole. Rural communities in particular are dependent upon small businesses for economic viability and growth.

In spite of their economic importance and their dominance in many rural communities, lenders frequently struggle in their effectiveness in serving the small business borrower. Many owners and managers of small businesses are not particularly well versed in finance, accounting and related fields and disciplines which are useful in assessing and understanding the financial performance and credit worthiness of a particular business. In some cases there is a major terminology gulf between the business manager and the lender – they don't talk the same language. And many small businesses don't have the detailed documentation that a lender would like to have to analyze and support a loan decision.

Small business lending also suffers from fragmentation – the types of loan requests are so varied that it is difficult to establish standard procedures and policies that can be applicable across a broad range of potential customers -- policies and procedures that would improve the efficiency and reduce the risk of the underwriting process. And the small size of many such loan requests also undermines the efficiency of the lending process since many of the analysis and compliance activities to make a loan decision are the same whether the size of the loan is $10,000 or a $100,000. So in spite of the opportunity and relative importance of small businesses and small business lending, many lenders have chosen to not serve this sector or serve it as a subset of personal/consumer lending.

Table 11: Number of Loans and Loan Purposes by Lender for Farm Households with Non-Farm Business Income - 2004 ARMS Data

Loan Purpose	Percentage of Loan Purpose for Entire Sample	*Percentage of Loan Purpose by Lender:* Farm Credit Services	Farm Service Agency	Small Business Administration	Commercial Banks	Suppliers	All Other Lenders
Land, Machinery, etc.	58.9%	68.2%	68.6%	93.8%	48.5%	94.0%	79.0%
Refinanced Farm Debt	18.1%	14.8%	26.1%	6.2%	20.6%	0.2%	7.3%
Refinanced Non-Farm Debt	1.9%	0.1%	0.0%	0.0%	2.7%	0.1%	0.1%
All Other Loan Purposes	21.2%	16.9%	5.4%	0.0%	28.2%	5.7%	13.6%
Percentage of Loans Guaranteed by:							
Farm Service Agency	6.1%	18.0%			3.5%	0.2%	0.0%
Rural Business Service	0.5%	0.0%			0.1%	0.0%	0.0%
Small Business Administration	2.0%	0.5%			2.7%	0.0%	0.0%
All Other Guarantees	3.8%	10.5%			2.9%	3.7%	0.0%
Total Number of Loans with a Reported Purpose	146,867	25,413	5,280	1,326	85,407	13,384	16,057

Note: More loans were reported without reporting a loan purpose: Entire Sample (212,900); Farm Credit Services (33,208); Farm Service Agency (8,288); Small Business Administration (1,566); Commercial Banks (119,861); Suppliers (24,113); All Other Lenders (25,864)