Predicting Financial Stress in Young and Beginning Farmers in the United States

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The U.S. agricultural sector has gone through some tough times in the past seven decades. Farm financial stress and farm bankruptcy were high in the Great Depression period and then in the mid 1980s. During the farm crisis period of 1982-1989 higher interest rates caused many farms financial stress. Financial stress tuned to crisis when declines in farm commodity prices, income, assets and land values made it difficult for some farmers to service their debt. These economic changes produced the most severe financial stress for the U.S. farm sector since the Great Depression. Approximately 18,212 farms filed for bankruptcy (Stam et al., 1991).

The rate of bankruptcy in the farm sector provides some indication of financial stress, but this is a lagging indicator. Farm crisis may have forced many farmers and farms out of business, this coupled with aging farm population, the issue of new generation of farmers has take a central stage in the discussion of new farm policies to assist young and beginning farmers. For example, Gale (1994) points out that entry into farming by the 'next generation' holds a place of central importance in the determination of industry structure and total number of farmers and farm families. From a policy perspective, the farm sector is dependent upon a lengthy biological production process that generates considerable physical and financial risk. The U.S. farm sector has historically been based on smaller firms that are more vulnerable to these risks. Public concern over farm policy rises when

financial stress appears to be taking an inordinate toll on smaller farms and farms families that rely on farming income as their main source of income. Stemming from concerns over the aging farm population and security of food production, Farm bill (2008) has new initiatives for young and beginning farmers. Various Federal and State programs now exist to help facilitate the entry of young farmers into farming business.

Young and Beginning farmers (YBFR, defined as farm operators less than 35 years old with farming experience of less than 10 years) have different needs than the established farmers. YBFR lack capital and experience in farming, lack the scale of operation needed to make profits, and they often face high land values and production costs (Mishra, Wilson and Williams, 2006). In addition, YBFR and their spouses are more educated and more likely to spend to find higher paying jobs outside the farming business (Mishra et al., 2002). As a result, they are reluctant to try traditional and time consuming farming processes using older technologies. It is recognized that young, beginning, and small farmers and ranchers may have limited financial resources. They need to develop and secure their credit worthiness with banks in order to secure future loans. The purpose for these loans could be related to production or capital investment (buying new land or machinery). Therefore, the objective of this study is to investigate the factors that predict financial stress of young and beginning farmers in the U.S. An understanding of the factors that influence financial stress is important as it allows policymakers to alter these factors to prevent or promote structural changes, depending on the prevailing

social, political, and economic goals. The analysis is conducted on a national farm-level basis with the unique feature of a larger sample, comprising farms of different economic sizes, and in different regions of the United States.

Background

A general view of financial stress is that it results from a mismatch between currently available liquid assets of a firm and its current obligations under it financial contracts (John, 1993). The cost of financial stress will have important implications for the liquidity and leverage policies of a firm. In particular, if the costs of financial stress are high, then the firm may choose to maintain a large fraction of their assets as liquid assets and/or be cautious in taking debt. Smaller assets base will signal lending institutions to be more careful in taking business risk with financially stressed firm. In a study of Fortune 500 companies, John (1993) found that firms with high long-term debt have a higher probability of bankruptcy. Further, the author also finds evidence that the debt in the capital structure of a firm decreases in its costs of financial stress.

In the 1980s there were many studies that investigated the use of financial ratios in predicting business failures (Casey, 1983; Houghton, 1984; Altman, 1983; Zimmer, 1980). These studies have provided evidence that financial ratios are useful in predicting business failure. While some users of ratio analysis are keenly interested in the prediction of business failure, others are more interested in the non-failure end of the failure/non-failure continuum. In agricultural economics literature several studies have investigated financials stress in bankruptcy firms

(Scott, 1981; Peel et al., 1986) or loan defaulters (Mortensen et al., 1988; Miller and LaDue, 1989; Turvey and Brown, 1990; and Turvey 1991). None of these studies have investigated the factors that affect farm businesses failure or predicted factors that might cause financial stress. Farm businesses are more complex than ever. More recently, Mishra et al., 2002 pointed out that in modern agriculture farm families' supplement their household income with off-farm income[2] and the farming decision making (production, financial, investment, and other non-farm related activities) are determined jointly by farm operators and their spouses.

Definition and Measurement of Financial Stress

The U.S. Department of Agriculture, Economic Research Service measures the overall financial performance of farms by combining a farm's net farm income and solvency position. Based on this information the farm business is classified into four categories. First, farms in a ***favorable*** position have debts less than 40 percent of their assets and positive net farm income. Second, ***Marginal solvency*** refers to positive-income, high-debt farms. Third, ***marginal income*** refers to negative-income, low-debt status. Fourth, farms in a ***vulnerable*** financial position have debts in excess of 40 percent of the value of their assets and negative farm income. This measure of financial performance is rooted in the 1980s, when USDA annual farm finance surveys were first developed. Because of its original design, the measure is not able to support more extensive analyses of a farm's debt-service capability. We refer to the fourth group, financially *vulnerable* farms, as financially

[2] Mishra et al., note that on average off-farm income may contribute as much as 90 % toward total household income. Share of off-farm income varies with farm type and farming region.

stressed farms. In our analysis, the first group of the farms (*favorable*) will serve as the base group.

Empirical Framework

In this report, a multinomial logit (*MNL*) model is used to examine the determinants and predict financial stress of farms that are owned/operated by young and beginning farmers (YBFR) whose farms are classified among four distinguished strategies (*M*) based on their financial position. In the first, I_1, farm have favorable financial position; in the second, I_2, farms have marginal income financial position; I_3, farms have marginal solvency financial position; and in the fourth, I_4, farms in the vulnerable financial position. Let Y_j takes the value 1 if the *j*th farm is in the *q*th state (financial position); 0 otherwise. The relative odds (*P*) of that a farm will be in financial positions are expressed using the following *MNL* model:

$$\log\left(\frac{P_{jq}}{P_{jM}}\right) = Z_j' \vartheta_q + \varepsilon_j, \qquad j=(1,\ldots,n),\ q=(1,\ldots,M\text{-}1), \tag{1}$$

where *log* is the natural logarithm, *Z* is a vector of exogenous explanatory, ϑ is a vector of parameters to be estimated, and ε is a random disturbance term. The means of explanatory variables as defined by vector *Z* and based on the distinct *M* states of financial position (4 in our case; favorable, marginal income, marginal solvency, and vulnerable). The conditional probability for the choice *q* is derived as in the following [for more detail, see Greene (2002), p. 721]:

(2) $$P_{jq} = \text{Prob}(Y_{jq} = 1) = \frac{\exp(Z_j' \vartheta_q)}{\sum_{k=1}^{M} \exp(Z_j' \vartheta_k)}, \qquad q = (1, \ldots, M\text{-}1),$$

which, alternatively, can be written as:

(3) $$P_{jq} = \frac{\exp(Z_j' \vartheta_q)}{1 + \sum_{k=1}^{M-1} \exp(Z_j' \vartheta_k)}, \qquad q = (1, \ldots, M\text{-}1),$$

$$P_{jM} = \frac{1}{1 + \sum_{k=1}^{M-1} \exp(Z_j' \vartheta_k)}.$$

where *log* is the natural logarithm, Z is a vector of exogenous explanatory variables, θ_{qM} is a vector of parameters to be estimated, and ε is a random disturbance term.

The interpretation of θ_{qM} is simplified even further by computing the marginal effects of Z_j on the probabilities of being in I_1, I_2, or I_3 as in [for more detail, see Greene (1997)]:

(4) $$\begin{aligned} \delta_q &= \frac{\partial P_q}{\partial X_q} = P_q \left[\beta_q - \sum_{q=1}^{M-1} P_q \beta_q \right] \\ &= P_q (\beta_q - \bar{\beta}), \end{aligned}$$

where $\bar{\theta}$ is a vector whose elements are the averages of all estimated θ_q (q=1,2,3). The signs of any particular θ_q and δ_q need not be the same. Although by definition $\theta_0 = 0$, which is done for the purpose of facilitating the computation, the marginal effects of the attributes on the probability of a farm business financial position I_4 are themselves not zero, and in fact they are computed as $\theta_0 = -P_0 \bar{\theta}$.

The maximum likelihood estimation procedure used to estimate the parameters (ϑ) of the multinomial logit model is undertaken by maximizing the following log-likelihood function L (see Greene, 1997; p. 916) as in: $L = \sum_{j=1}^{n} \sum_{q=1}^{M} I_{jq} \ln P_{jq}$, where ln is natural logarithm, and P_{jq} is the probability of having a succession plan q by the jth household. In estimating the MNL model as described in equation (1), the equation for the odds of q versus M is: $\frac{P(I=q|Z)}{P(I=M|Z)} = \exp(Z[\vartheta_q - \vartheta_M])$. As noted by Long (1997; p. 182), the odds are determined without any consideration of the other potential outcomes that might be available (i.e., allowing the reference category to be other than I_4). This is known in the literature as the independence of irrelevant alternatives (IIA). Hausman and McFadden (1984) proposed a Hausman-type test to examine the validity of the IIA assumption (Maddala, 1983). The basic elements of the test in the context of this paper involve the comparison of a model estimated using a full set of choice alternative ($\hat{\vartheta}_F = (\hat{\vartheta}_{1F}, \hat{\vartheta}_{2F}, \hat{\vartheta}_{3F})'$) with estimated covariance matrix $\hat{\Omega}_F$ against a model using a restricted set of choice alternative (e.g., $\hat{\vartheta}_R = (\hat{\vartheta}_{1F}, \hat{\vartheta}_{2F})'$) with estimated covariance matrix $\hat{\Omega}_R$. The Hausman test of IIA is defined as: $H_{HA} = (\hat{\vartheta}_R - \hat{\vartheta}^*_F)'[\hat{\Omega}_R - \hat{\Omega}^*_F]^{-1}(\hat{\vartheta}_R - \hat{\vartheta}^*_F)$, which is asymptotically distributed as chi-square with degrees of freedom equals to the rank of $\hat{\Omega}_R - \hat{\Omega}^*_F$. Note that $\hat{\vartheta}^*_F$ and $\hat{\Omega}^*_F$ are same as $\hat{\vartheta}_F$ and $\hat{\Omega}_F$ with further deletion of row-vectors and column-vectors to allow for conformity of matrices in the H_{HA} test (for further detail, see

Long, 1997; p. 184). A significant value of H_{HA} would indicate the IIA assumption is invalid or reject the null hypothesis of IIA.

Data Source for Young and Beginning Operators

Data for this analysis are from the 2004-2006 Agricultural Resource Management Survey (ARMS). ARMS is conducted annually by the Economic Research Service and the National Agricultural Statistics Service. The survey collects data to measure the financial condition (farm income, expenses, assets, and debts) and operating characteristics of farm businesses, the cost of producing agricultural commodities, and the well-being of farm operator households.

The target population of the survey is operators associated with farm businesses representing agricultural production in the 48 contiguous states. A farm is defined as an establishment that sold or normally would have sold at least $1,000 of agricultural products during the year. Farms can be organized as proprietorships, partnerships, family corporations, nonfamily corporations, or cooperatives. Data are collected from one operator per farm, the senior farm operator. A senior farm operator is the operator who makes most of the day-to-day management decisions. For the purpose of this study, operator households organized as nonfamily corporations or cooperatives and farms run by hired managers were excluded.

The 2004 to 2006 ARMS collected information on farm households in addition to farm business data. For example, it collected detailed information on off-farm hours worked by spouses and farm operators, the amount of income received from off-farm work, net cash income from operating another farm/ranch, net cash income from operating another business, and net income from share renting. The heavy emphasis in off-farm employment of operators and spouses suggests that the farm

household has an alternate goal to generating maximum household income for the farm business operation. Furthermore, income received from other sources, such as disability, social security, and unemployment payments, and gross income from interest and dividends was also counted. The 2004 to 2006 ARMS contains a sample of 19,638 farms, whose primary operators had less than 10 years of farming experience, which could be classified as farms operated by young and beginning farmers and ranchers (YBFR). The survey design of ARMS allows each sampled farm to represent a number of farms that are similar, referred to as a survey expansion factor. The expansion factor, in turn, is defined as the inverse of the probability of the surveyed farm being selected. Weighted means (expanded by the expansion factor, which is the weight) procedure is used to extrapolate representative sample to a population. This is based on the procedure that is specific to the ARMS data (see Dubman for details).

Result and Discussion

Results of multinomial logit regression model, along with summary statistics, are presented in table 1. A cursory look at the results points to the importance of farmer's age, size of operation, farm tenancy, type of crops grown in predicting financial stress of young and beginning farmers. Results also show the significance of off-farm income to farm financial performance and its balance sheet. The model estimated, is deemed to be fairly successful as the correlation between predicted and observed values was 0.53. Since we are interested in the factors affecting financial stress (vulnerable farms), the last category in table 1 and table 2 are of

importance and our discussion will focus on this category only. The coefficients obtained in table 1 only tell the significance, but not the magnitude, table 2 reports the marginal effect of various factors affecting financial stress among YBFR. Results show a quadratic relationship between age and financial stress. This is evident from a positive and a negative coefficient on operator's age and age squared variable in table 1. However, only the age squared variable is significant and the magnitude of this impact is very small (0.001). Nonetheless results suggest that as farmers get older the likelihood of being vulnerable (financially stressed) decreases.

Farm ownership plays an important role in the financial position of the farm business. Our finding suggests that YBFR who are tenants are more likely to be financially vulnerable compared to full owners (base category). A possible explanation is that tenant farmers have additional debt burden. Our results indicate that tenants are 1.4 percent more likely to be financially stressed than full owners. On the other hand, results in table 2 show that part-owners are less likely to be financial stressed (0.4 percent) than full owners. A possible explanation for this could be that part owners have lower debt-to-asset ratio. Another important finding of this study is that the contribution of off-farm income to farm business financial position. The coefficient of share of farm income to total household income is negative and significant for vulnerable farms (Table 1). The marginal effects in table 2 show that as the share of farm income rises the probability of farm vulnerability decreases by 0.1 percent. This is counter intuitive, but it could be a case where these income-solvency positions (the four categories) are only defined by

farm income and takes into account only the business part of the debt and assets. This clearly ignores the total household assets and debt (farm and nonfarm assets and debt).

Among various farms types, only farms specializing in poultry and other livestock are more likely to be vulnerable compared to financially favorable farms (Table 1), however, the marginal effects are not significant. We used USDA farm typology to investigate the impact of various farm sizes on farm financial position. Results in table 1 show that only two types of farms, residential/life style farms (small farms where the operator's main occupation in other than farming) and large farms (farm sales > $500,000) are more likely to be vulnerable farms compared to favorable farms. For example, residential/lifestyle farms are about 2 percent and large farms are about 2.3 percent more likely to be financially vulnerable compared to favorable farms. Large farms have higher debt and could be in a lower debt-to-asset category. Large farms acquire additional debt to expand farming operations or for capital investment. On the other hand, residential/lifestyle farms are more likely to be engaged in occupations other than farming and this may lead to lower farm income. In many cases these farms have negative income from farming (Mishra et al., 2002), therefore classified as vulnerable farms. Findings from this study suggest that farms with higher operating leverage (defined as a ratio of total fixed expenses to total variable expenses) are more likely to be financially stressed than favorable farms. However, the impact is very small (0.02 percent). Farms with higher fixed costs may have lower to negative profits. Further, farms with higher

fixed expenses will have difficulty reducing costs in the short term and which may lead to lower profits. Lastly, the dummy variables for year 2004 and 2005 show that farms in these two years were less likely to the financially stressed. The U.S. Department of Agriculture reports that in 2004 and 2005 farmers received record farm income (AIS 83 and 84, USDA).

Summary and Conclusion

The objective of this study is to investigate the factors that predict financial stress of young and beginning farmers in the U.S. Using a multinomial logit model, the determinants of financial stress in young and beginning farmers was examined across four solvency classes: favorable, marginal income, marginal solvency, and vulnerable. The analysis focuses solely on the results of the vulnerable category. Results show that farmer's age, size of operation, ownership, year of operation, and farm type are significant determinants of financial stress. The marginal effects of these determinants, while significant, were small on average. A possible explanation for these results could be the sample years that were chosen. More meaningful information regarding financial stress might be obtained by using years spanning or immediately preceding a farm crisis rather than a time period of record farm incomes.

References

Altman, E.I. "Predicting Railroad Bankruptcy in America" *Bell Journal of Economics and Management Science*, Spring 1983.

Casey, C.J. Jr. "Additional Usefulness of Accounting Ratios for Subjects' Predictions of Corporate Failure", *Journal of Accounting Research* (Spring 1983), pp: 361-68.

Dubman, R.W. "Variance Estimation with USDA's Farm Costs and Returns Surveys and Agricultural Resource Management Study Survey" *AGES 00-01*. Economic Research Service, U.S. Department on Agriculture, Washington D.C., 2000.

Franks, Jeremy R. "Predicting financial stress in farm businesses." *European Review of Agricultural Economics 25 (Aug. 1997): 30-52.*

Gale, H. "Longitudinal Analysis of Farm Size Over the Farmer's Life Cycle." *Review of Agricultural Economics* 16 (Jan. 1994): 484-87.

Greene, W.H. *Econometric Analysis.* Third edition. Englwood Cliffs, NJ: Prentice-Hall, 1997.

Hausman, J., and D. McFadden. "Specification Tests for the Multinomial Logit Model." *Econometrica*, Vol. 52, 5(Sept. 1984):1219-1240.

Houghton, K.A. "Accounting Data and the Predication of Business Failure: The Setting of Priors and the Age of Data", *Journal of Accounting Research* (Spring 1984), pp: 361-68.

John. T. "Accounting Measures of Corporate Liquidity, Leverage, and Costs of Financial Stress" *Journal of Financial Management,* Autumn, 1993: 91-100.

Long, J. Scott. *Regression Models for Categorical and Limited Dependent Variables.* SAGE Publications, Inc. Thousand Oaks, California, 1997.

Maddala, G.S. (1983). *Limited-Dependent and Qualitative Variables in Econometrics.* Cambridge: Cambridge Univ. Press.

Miller, L.H. and E. LaDue. "Credit Assessment Models for Farm Borrowers: A Logit Analysis", *Agricultural Finance Review*, 49(1989): 22-36.

Mishra, A.K., M.J. Morehart, Hisham S. El-Osta, James D. Johnson, and Jeffery W. Hopkins. "*Income, Wealth, and Well-Being of Farm Operator Households*." Agricultural Economics Report # 812, Economic Research Service, U.S. Department of Agriculture, Washington, D.C. Sept. 2002.

Mortensen, T., D. L. Watt, L.F. Leistritz. "Predicting Probability of Loan Default", *Agricultural Finance Review*, 48(1988): 61-67.

Peel, M. J., D. A. Peel, and P. F. Pope. "Predicting Corporate Failure—Some Results for the U.S. Corporate Sector", *Omega International Journal of Management Science,* 14(1), 1986: 5-12.

Scott, J. "The Probability of Bankruptcy, a Comparison of Empirical Predictions and Theoretical Models", *Journal of Banking and Finance*, 5(3), 1981: 314-44.

Stam, J., S. Keonig, S. Bentley, and H. Gale. *Farm Financial Stress, Farm Exits, and Public Sector Assistance to Farm Sector in the 1980's.* AER-645, U.S. Department of Agriculture, Economic Research Service, Washington DC., 1991.

Turvey, C. G. "Credit Scoring for Agricultural Loans: A Review with Applications", *Agricultural Finance Review*, 48(1988): 61-67.

Turvey, C. G. and R. Brown. "Credit Scoring for Federal Lending Institutions: The Case of Canada's Farm Credit Corporation", *Agricultural Finance Review*, 50(1990): 47-57.

U. S. Department of Agriculture, Economic Research Service. *Agricultural Income and Finance Outlook/AIS-82.*November 2004, Washington DC.

U. S. Department of Agriculture, Economic Research Service. *Agricultural Income and Finance Outlook/AIS-83.*November 2005, Washington DC.

Zimmer, I. "A Lens Study of the Predictions of Corporate Failure by Bank Loan Officers", *Journal of Accounting Research* (Autumn 1980), pp: 629-636.

Table 1: Parameter estimates of financial stress among young and beginning farmers, 2004-2006

Variable	***Log odds ratio (Marginal Income/ Favorable)***	***Log odds ratio (Marginal Solvency/ Favorable)***	***Log odds ratio (Vulnerable/ Favorable)***
Constant	-1.936***	-2.045***	-3.52***
	(0.3331)	(0.5652)	(0.702)
Operator age	0.0273***	-0.0323*	0.024
	(0.0098)	(0.0181)	(0.0231)
Age Squared	-00002***	-0.0001	-0.0001***
	(0.0000)	(0.0002)	(0.0002)
Operator's education	0.0491***	0.0737***	0.0503**
	(0.0106)	(0.0194)	(0.0232)
Part owner	0.2627***	-0.1967**	-0.1573*
	(0.042)	(0.0784)	(0.0940)
Tenant	0.4879***	0.8449***	0.725***
	(0.0670)	(0.1024)	(0.1227)
Risk aversion	-1.349*	0.4049	0.1226
	(0.7666)	(0.5914)	(0.6941)
Government payments	-0.2184***	0.0123	0.002
	(0.0435)	(0.0809)	(0.0964)
Share of farm income to total household income	-0.062**	0.0000	-0.0625**
	(0.0309)	(0.0001)	(0.0308)
Operated acres (farm size)	0.0001**	-0.0000	-0.0000
	(5.36 e-06)	(0.0000)	(0.0000)
Cash grain farm	0.23650*	0.0447	0.1074
	(0.13050)	(0.1643)	(0.2211)
Other field crop farm	0.1983	-0.2043	0.1388
	(0.1347)	(0.1888)	(0.233)
High value crop farm	0.0201	-0.1103	-0.1711
	(0.1366)	(0.1794)	(0.2413)
Beef farm	0.3294**	-0.1608	0.2542
	(01315)	(0.188)	(0.2301)
Hogs farm	0.2383	0.6002***	0.3306
	(0.1861)	(0.2271)	(0.3144)
Poultry farm	0.0043	0.7561***	0.4008*
	(0.1481)	(0.1782)	(0.2426)
Dairy farm	0.0010	0.297*	0.1874
	(0.13938)	(0.1674)	(0.2305)
Other livestock farm	0.7556***	-0.2898	0.5985**
	(0.1405)	(0.2433)	(0.2536)
Retirement farm (farm size)	-0.6609***	-0.8164*	-0.1763
	(0.0918)	(0.4224)	(0.3787)
Residential farm (farm size)	-0.0832	0.1851	0.7296***
	(0.0804)	(0.2801)	(0.2820)
Intermediate farm (farm size, sales less than $250,000)	-0.2990***	-0.0927	0.494*
	(0.081)	(0.2909)	(0.292)
Intermediate farm (farm size, sale between $250,000-$499,999)	-0.6266***	0.5610**	0.4520
	(0.0953)	(0.2817)	(0.3063)
Large farm (sales >$500,00)	-0.7281***	1.074***	0.9933***
	(0.0986)	(0.2730)	(0.2953)
Operating leverage (fixed cost/total variable costs)	-0.0010	0.0116**	0.0118**
	(0.0065)	(0.0045)	(0.0053)
Year dummy (2004)	-0.2273***	-0.0322	-0.3085***
	(0.043)	(0.075)	(0.0926)
Year dummy (2005)	-0.1522***	-0.046	-0.1950**
	(0.0439)	(0.079)	(0.0936)
Pesudo-R^2		0.24	

Number of observations	19,393

*Significant at 10%, **Significant at 5%, ***Significant at 1%

Table 2: Marginal effects of factors affecting financial stress of young and beginning farmers

Variable	***Log odds ratio (Marginal Income/ Favorable)***	***Log odds ratio (Marginal Solvency/ Favorable)***	***Log odds ratio (Vulnerable/ Favorable)***
Operator age	0.0037**	-0.0016**	0.0004
Age Squared	-0.0001**	-0.0003	-0.000**
Operator's education	0.0057***	0.0028***	0.0007
Part owner	0.0364***	-0.01012***	-0.0038*
Tenant	0.0581***	0.0415***	0.01489***
Risk aversion	-0.1793	0.0268	0.00643
Government payments	-0.0288***	0.0020	0.0007
Share of farm income to total household income	-0.0080***	0.0005***	-0.0010***
Operated acres (farm size)	1.81e-06**	-8.35e-07	-1.03e-06
Cash grain farm	0.0318	0.0001	0.0013
Other field crop farm	0.0282	-0.0096	0.0024
High value crop farm	0.0039	-0.0045	-0.0032
Beef farm	0.0458**	-0.0091	0.0043
Hogs farm	0.0259	0.0303*	0.0057
Poultry farm	-0.0079	0.0430***	0.0082
Dairy farm	-0.0028	0.0140	0.0037
Other livestock farm	0.1202***	-0.0168**	0.0110
Retirement farm (farm size)	-0.0677***	-0.0240**	-0.0013
Residential farm (farm size)	-0.0148	0.0080	0.0188*
Intermediate farm (farm size, sales less than $250,000)	-0.0373***	-0.0026	0.0133
Intermediate farm (farm size, sale between $250,000-$499,999)	-0.0735***	0.0343*	0.0122
Large farm (sales >$500,00)	-0.1022***	0.0563***	0.0235**
Operating leverage	-0.0002	0.0005**	0.0002*
Year dummy (2004)	-0.0277***	0.0004	-0.0052**
Year dummy (2005)	-0.0186***	-0.0008	-0.0034*

*Significant at 10%, **Significant at 5%, ***Significant at 1%