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Capital Structure in Modern American Agriculture: Evidence from a National Survey

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Capital Structure in Modern American Agriculture: Evidence from a National Survey

Abstract: Factors affecting the level of farm and household debt have been of sporadic concern in agricultural economic literature. In the Mid 1980s, farm business and household debt was hypothesized to contribute to the farm financial crisis. This paper examines factors affecting the probability of farm business and household debt and the level of that debt. The results indicate that farm debt is a decreasing function of operator age, importance of government payments, and significance of cash grain crops, but an increasing function of the size of the farm firm.

Keywords: farm business debt, farm household debt, selection bias

1. Introduction

This study examines factors affecting the choice of debt at by farm firms and households using data from the Agricultural Resource Management Survey (ARMS). The level of farm sector debt has been a recurrent theme in agricultural economics. Interest in the level of debt and factors affecting that level increases in periods of financial stress (such as that observed in the mid and late 1980s) and tends to subside in period of relative prosperity in the farm sector (such as that experienced from 2006 through 2012). However, the fact that the financial position of the farm sector was relatively stable from the onset of the difficulties in the consumer and mortgage credit markets which began in the late summer and fall of 2008 raises questions about business and household debt decisions by farms and rural households. The results indicate that the level of farm debt increases with the size of the farm (measured in the natural logarithm of the number of acres), but declines in response to the share of government payments, the share of grain revenues, and if the spouse has off-farm employment. The level of household nonfarm debt is similar, except that the nonfarm debt increases if the operator has off-farm employment.

2. Theory of Debt Choice

To develop an empirical model of debt choice, this paper examines three separate strands of literature. The first strand is literature involving the consumer's choice of debt. This literature historically has focused on the interaction between money supply, consumer debt, and the general economy (i.e., the macroeconomic effect of debt). The second strand of literature is developed from the perspective of the corporation. Most of the work in this area has focused primarily on the possible arbitrage between stock-based ownership interests and the bond market for debt culminating in the Modigliani-Miller theorem. The final strand of literature examines debt choice within the sole-proprietorship. This literature has largely developed within agricultural economics.

a. Models of Consumer Debt

Historically, economic literature has focused on the effect of consumer debt through the effectiveness of monetary policy. Mishkin (1976) develops a model of the effect of monetary policy on the consumer demand for durables through consumer debt. Specifically, Mishkin presents a model where consumer durables are illiquid, so purchases of durables increases the riskiness of consumption over time by increasing the cash flow required for debt service. Offsetting this effect, increased holdings of financial assets reduces the riskiness of consumption over time, but does not generate the utility return of investing in consumer durables. Mishkin's model is based on a Tobin-Markowitz formulation which is similar to the risk-balancing model developed by Collins (1985). Mishkin estimates the effect of debt on the demand for consumer durables as

$$K = \alpha_0 + \left(\beta_0 + \beta_1 [\tilde{r} + d] \frac{I_d}{I_c} \right) Y_p + \alpha_2 D + \alpha_3 F + \varepsilon \quad (1)$$

where K is the demand for consumer durables, \tilde{r} is the interest rate on AAA bonds, d is the depreciation rate for consumer durables, I_d is the price deflator on consumer durables, I_p is the price deflator for all consumer expenditures, D is the level of household debt, F is the level of financial assets, and ε is the residual. Mishkin finds that each dollar increase in consumer debt reduces the demand for consumer durables by 22 cents. In Mishkin's formulation monetary policy affects the interest rate (\tilde{r}) and the inflation rates (implicit in I_d and I_c) which affects the demand for consumer durables and, hence, the level of economic activity.

Other macroeconomic formulations that directly incorporate the level of household debt include the overlapping generations models of money (OLGs) proposed by Wallace (1980). Wallace proposes a model where consumers live for two periods. Consumers when young consumer and make investment decisions that pay off when old:

$$\begin{aligned} c_1^h(t) + k^h(t) + p(t)m^h(t) - y &\leq 0 \\ c_2^h(t) - xk^h(t) + p(t+1) \left[m^h(t) + \frac{(z-1)M(t)}{N(t)} \right] &\leq 0 \end{aligned} \quad (2)$$

where $c_i^h(t)$ is the consumption of household h at time t (where household h is at lifetime $i \in \{1, 2\}$), $k^h(t)$ is the amount of goods placed in storage (paying x in the next period), $p(t)$ is the level of prices at time t , $m^h(t)$ is the stock of money held by the household (purchased with income when young and sold to finance consumption when old), z is the growth rate in money supply - $M(t)$, and $N(t)$ is the population at time t . In this model, households maximize utility which is a function of consumption when young and old. The crux of the model is that monetary policy affects the rate of investment in that households use the implicit borrowing activity to balance consumption across periods.

Other recognition of the significance of consumer debt can be found in the literature on investment in housing. Like Mishkin's development of other consumer durables, it is typically recognized that the purchase of a house provides a service flow. The U.S. Department of Commerce/Bureau of Economic Analysis describes how the rental value of homes is imputed into system of national accounts (BEA p. 5). Recently, Aoki, Proudman, and Vlieghe (2004) examined the relationship between the purchase of homes and the consumer credit market. In the boom, equity in homes provided a financial accelerator (increasing the velocity of money). However, as pointed out by Attanasoi et al. (2009) this linkage between home values and the velocity of money has contributed to boom/bust cycles in the economy.

b. Corporate Debt Choice Models

Myers (1984) starts his presidential address for the American Finance Association with the Question "How do firms choose their capital structure?" and follows the question with the answer "We don't know". A starting point of the discussion of the capital structure problem is typically the Modigliani-Miller theorem (Modigliani and Miller 1958) which states that the value of assets is independent of the combination of debt and capital used to purchase them. The proposition is proved using an arbitrage proof. Individuals are allowed to buy or sell bonds to offset the purchase of common stock. Thus, the ability to arbitrage debt for equity guarantees that systematic profit cannot be made by the initial debt/common stock choice.

In his development of the capital structure problem, Myers (1984) sets out two ways to think about the capital choice problem:

1. A *static tradeoff* framework, in which the firm is viewed as setting a target debt-to-value ratio and gradually moving towards it, in much the same way that a firm adjusts dividends to move towards a target payout ratio.

2. An old-fashioned *pecking order* framework, in which the firm prefers internal to external financing and debt to equity if it issues securities. In the pure pecking order theory, the firm has no well-defined target debt-to-value ratio.
(Myers 1984, p.576)

In a way, this quote frames an interesting component of the capital structure puzzle. Specifically, do firms have a true target or is the capital structure determined by path-dependent process of deciding to accept investment opportunities.

Myers's formulation of the static tradeoff problem is that the firm's management (either the chief financial officer, chief executive officer, board of directors, or some combination thereof) chooses the level of debt that balances the benefit from the tax shield. Further, in the static tradeoff model the overall level of the firm's assets are assumed to be fixed or the investment plans are held constant. Under these assumptions if the cost of adjusting the debt level is small, the observed level of debt will be approximately optimal. Hence, any observed change in debt-to-asset level could be attributed to changes in the firm's business situation (perhaps changes in relative risk). The possible effect of large costs of adjustment makes it difficult to test for the implications of Modigliani-Miller

The conclusion is a Heisenberg uncertainty principle of finance. The potential size of the adjustment costs then leads to a conjecture about the static tradeoff formulations. Specifically, according to Myers, if the adjustment costs are small then the diversity of capital structures are hard to explain. Thus, the adjustment costs must be large enough to take firms away from their targets for an extended period of time. The conclusion for researchers is that we should probably spend less time refining our models of static tradeoffs and more time understanding these costs of adjustment.

Two possibilities exist to salvage the static tradeoff model. First, the effect of the debt shield may produce a diversity of capital structures. As described by Miller (1977) differences between the marginal tax rate paid by the corporation and that of the individual could lead to a dispersion in capital structures. Cordes and Sheffrin (1983) provide some support for Miller's tax hypothesis finding "... there is significant variation in the after-tax marginal cost of debt faced by different firms and industries." Alternatively, the diversity in capital structures may be explained by differences in the potential costs of financial stress

The literature on costs of financial distress supports two qualitative statements about financing behavior.

1. Risky firms out to borrow less, other things equal. Here "risk" would be defined as the variance rate of the market value of the firm's assets. The higher the variance rate, the greater the probability of default on any given package of debt claims. Since costs of financial distress are caused by threatened or actual default, safe firms ought to be able to borrow more before expected costs of financial distress offset the tax advantages.
2. Firms holding tangible assets-in-place having active second-hand markets will borrow less than firms holding specialized, intangible assets or valuable growth opportunities. The expected cost of financial distress depends not just on the probability of trouble, but the value lost if trouble comes. Specialized intangible assets or growth opportunities are more likely to lose value in financial distress (Myers 1984, pp.580-581).

Myers's first point is consistent with the optimal debt models for agriculture proposed by Collins (1985), Featherstone et al. (1988), and Moss, Ford, and Boggess (1989). However, the conjecture

that the more tangible the asset and the better the secondary market for those assets, the more likely that firms are to rely on equity differs from the experience of agriculture. Typically, the market for agriculture's dominant asset (farmland) is well established.

Myers contrasts the static tradeoff hypothesis with the *Pecking Order Theory* where firms look to internal sources of capital for investments first. The four points to explain the *Pecking Order Theory* are: 1. Firms prefer internal finance; 2. They adapt their target dividend payout ratios to their investment opportunities, although dividends are sticky and target payout ratios are only gradually adjusted to shifts in the extent of valuable investment opportunities. 3. Sticky dividend policies, plus unpredictable fluctuations in profitability and investment opportunities, mean that internally-generated cash flow may be more or less than investment outlays.... 4. If external finance is required, firms issue the safest security first. That is, they start with debt, then possibly hybrid securities such as convertible bonds, then perhaps equity as a last resort (Myers 1984, p.581).

Under the pecking order framework, the investments in agriculture are not large enough to trigger a search for equity capital. This conjecture is not convincing. Myers (1984) introduces *external financing with asymmetric information* as a possible foundation of the pecking order model. Specifically, Myers presents the scenario:

Suppose the firm has to raise N dollars in order to undertake some potentially valuable investment opportunity. Let y be this opportunity's net present value (NPV) and x be what the firm will be worth if the opportunity is passed by. The firm's manager knows what x and y are, but investors in capital markets do not: they see only a joint distribution of possible values (\tilde{x}, \tilde{y}) . The information asymmetry is

taken as given....The *benefit* to raising N dollars by a security issue is y , the NPV of the firm's investment opportunity. There is also a possible cost: the firm may have to sell the securities for less than they are really worth. Suppose the firm issues *stock* with an aggregate market value, when issued, of N However, the manager knows the shares are really worth N_1 . That is, N_1 is what the new shares will be worth, other things equal, when investors acquire the manager's special knowledge.... The one that we think makes the most sense is maximizing the "true" or "intrinsic" value of the firm's *existing* shares. That is, the manager worries about the value of the "old" shareholders' stake in the firm (Myers 1984, pp.582-583).

A complete version of the model is presented in Myers and Majluf (1984), but the storyline is that the market undervalues the new shares because potential investors do not observe the value of the additional investment. Thus, managers use internal resources so that the market values of existing shareholders do not suffer. While the reasoning behind the model is somewhat different, several authors have suggested that asymmetric information explains (at least in part) the sector's reliance on debt (Innes 1990, Innes 1991, and Innes 2002).

c. Models of Agricultural Debt

Debt-choice models in agricultural have largely followed the formulation of Collins (1985) who hypothesized that farmers choose the level of debt to balance business risk (the risk endemic to the firms business) using leverage. The financial risk (the risk to overall business enterprise) could be reduced reducing the amount of leverage, while more risk resulted from increasing the leverage. Featherstone et al. (1988) offered an extension to Collins's original formulation integrating the effect of farm program payments. Moss, Ford, and Boggess (1989); Collins and Gbur (1991) analyze whether risk averse decision makers plunge under financial stress (a

hypothesis suggested by Robinson, Barry, and Burghardt 2987). Extensions of the risk balancing model have been proposed by Collins and Karp (1993) and Ramirez, Moss, and Boggess (1997). These studies were largely theoretical with the exception of Ramirez, Moss, and Boggess who rely on the estimates of Ramirez (1990) who used a Generalized Method of Moments estimator applied to aggregate farm data. Ramirez used the debt-choice formulation to estimate an aggregate risk aversion coefficient.

Collins formulates the rate of return on equity (R_E) as

$$R_E = [R_A - K\delta] \frac{1}{1-\delta} \quad (3)$$

where R_A is the operating return on assets (including the capital gains), K is the cost of debt, and δ is the debt-to-asset ratio. Assuming normality and maximizing expected utility yields the optimum debt-to-asset choice as

$$\delta^* = 1 - \frac{\rho\sigma_A^2}{\mu_A - K} \quad (4)$$

where ρ is the absolute relative risk aversion coefficient, σ_A^2 variance of the rate of returns on assets, and μ_A is the expected rate of return to assets. The debt-choice problem for the farm firm is much simpler than that of the corporation because the agricultural firm's level of equity is largely fixed. The only choice is whether to increase borrowing.

3. Data and Methods

This research utilizes Agricultural Resource Management Survey (ARMS) data from 2009, 2008, and 2007. The ARMS is conducted annually by the Economic Research Service and the National Agricultural Statistics Service (for more detail, see

<http://www.ers.usda.gov/Briefing/ARMS/>). The survey collects data to measure the financial condition (farm income, expenses, assets, and debts, both farm and non-farm debt) and operating characteristics of farm businesses, the cost of producing agricultural commodities, and the well-being of farm operator households (income from farm, off-farm, and other business ventures are also collected). The target population of the survey is operators associated with farm businesses representing agricultural production in the 48 contiguous states. Data is collected from a single, senior farm operator, who makes most of the day-to-day management decisions. Summary statistics for the data used in this study are presented in Table 1.

Our analysis focuses on two different, but related debt decisions. First, we examine the factors that affect the selection of farm (or business) debt. Based on the standard agricultural literature, we would anticipate this decision to be driven by factors determining the profitability and riskiness of the agricultural operation. Variables we consider include the age of the operator (more a life cycle variable) [OP AGE], the natural logarithm of the number of acres in the operation [LN FR ACRES], the share of government payments as a proportion of [SH GOVCASH], dummies for farm size [F_SLMR, F_SLOWER, F_SHIGHER, F_SLARGE, F_SVLARGE] corresponding to the ERS size typology, whether the farm specializes in cash grains [FR CGRAIN], two annual dummies [Y_2007, Y_2008], whether the farmer works off the farm [OP OFFARM], whether the spouse works off the farm [SP OFFARM], and eight regional dummies [R_NCRESENT, R_NGPLAINS, R_PGATEWAY, R_EUPLANDS, R_SSEABOARD, R_FRIM, R_BARANGE, R_MPORTAL] corresponding to the ERS regional typology (see figure 1). The second regression then uses the same variables to examine the household debt-choice.

Intuitively, we expect that the level of farm debt will decline with the age of the operator and increase with the number of acres under cultivation. Other variables tend to be less easy to sign *a priori*. Intuitively, increases in the level of government payments may signal agricultural that is less risky (i.e., government programs are limiting the market risk). However, government programs may be more likely for crops that are inherently more risky. Similarly, are cash grain operations more risky than other types of agriculture? In addition, what is the effect of off-farm employment on agricultural debt? Do farmers and their spouses seek employment off farm to stabilize consumption? Or is off-farm employment a source of outside equity which is a substitute for debt?

Econometrically, we recognize that the debt-choice formulation implies a selection bias. Not all farmers have debt. Younger farmers are more likely to have debt than older farmers. In addition, the probability of farm debt varies by type of agriculture. Hence, we use the regions as part of a Heckman specification to correct for selection bias. The systematic difference between the farmers with debt and no debt can manifest themselves in the level of debt, which in turn biases our impact estimates. One approach that has been used in the past to address this problem (See McBride and El-Osta, 2002) is to use an approach similar to Heckman's (1979) two-step procedure using the full sample (rather than just the selected sample, as in the classical Heckman two-step approach). This is done by appending the inverse mills ratio to the level of farm and nonfarm debt model of the farm household. In this study the first stage of Heckman's technique involves the estimation of a farm debt choice (nonfarm debt choice) model using the probit analysis. Estimated parameters from the probit model are then used to estimate a random variable (λ , inverse Mills Ratio, IMR).

In the second stage of Heckman's technique, $\hat{\lambda}$ is used as a regressor in the linear regression model in level of farm and non-farm debt. The significance of $\hat{\lambda}$ can be interpreted as a test for selectivity bias, and its inclusion allows for the consistent estimation of the model's parameters.

4. Results

Table 2 presents the results for the debt choice by the farm firm. These results indicate that probability of farm debt is an increasing function of the operator age, the size of the operation, whether the farm is a very large farm, cash grain farms, and whether the operator has off-farm employment. The probability of farm debt decreases with limited resource farms. Regionally, the probability of farm debt increases in the Northern Crescent and the Uplands, but is lower in the Gateway and Mississippi Portal. Given these results, the selection effect is statistically significant at any conventional confidence level. The level of farm debt is then a decreasing function of operator age, the share of government payments to cash revenue, the specialization in cash grains, and off-farm employment of the spouse.

As depicted in Table 3, the probability of household debt declines with an in operator's age and the size of the farm business (measures as the logarithm of acres). In addition, the results indicate that the probability of household debt decreased in 2007, but increased (slightly) in 2008. Consistent with the results in Table 4, both off farm employment of the operator and spouse increase the probability of household debt. Similarly, the level of household debt increases with an increase in the age of the operator and the size of the farm. The level of household debt is higher for operators with farm employment, but lower if the spouse has off-farm employment.

5. Summary and Conclusions

This study examines factors affecting debt both for the farm firm and the farm household. While the level of household debt in the general economy has been tied to the onset of the recession in the United States in December 2007, the farm sector appears relatively solvent. The question is what factors explain the current debt levels in the farm sector and are these factors different for the agricultural sector compared with the general economy? In general, we find that the level of farm business debt decreases with operator age, importance of government payments, percent of receipts from cash grain operations, and whether the spouse works off the farm, but increases as the size of the farm increases. We find that the level of household debt increases with an increase in the operator age, size of the firm, share of government payments, and whether the operator has off farm employment.

However, rather than providing definitive answers, our results raise a number of policy relevant questions. First, as developed in the paper, most theoretical models of farm debt imply that the level of optimal debt increases as the expected rate of return on assets increases and declines as either the riskiness of the return on agricultural assets increases or the cost of capital increases. Thus, the negative impact of government payments on the level of farm business debt raises a variety of questions. Does government involvement imply lower rates of return on agricultural assets or higher levels of risk associated with the return on such activities? Such a conclusion would appear counterintuitive. However, such a conjecture suggests two hypotheses: (1) Increased significance in government payments and/or cash grains reduces the expected return on assets. And, (2) increased government payments and/or cash grains increases the riskiness of returns on agricultural assets. While the first hypothesis can be readily tested using ARMS, the second hypothesis is far more problematic.

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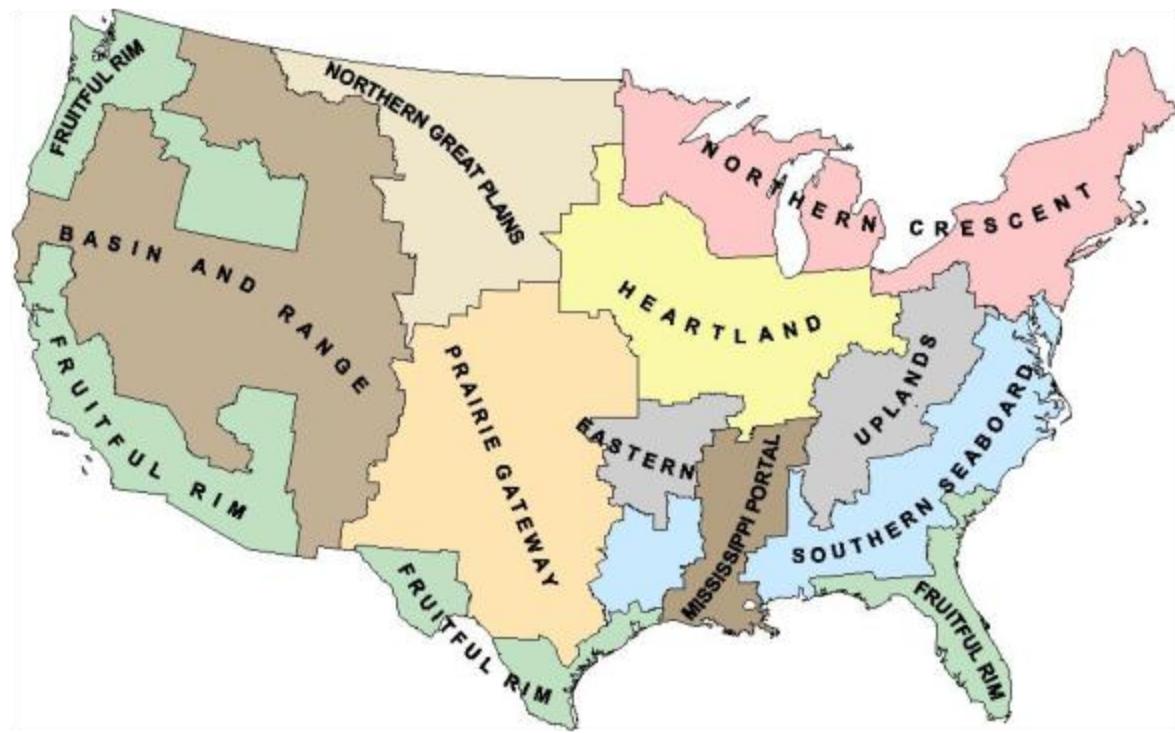


Figure 1: USDA Farm resource regions

Table 1: Variable name and summary statistics, 2007-2009

Variable name	Description	Mean (St. dev.) ¹
F_DEBT	Total amount of farm debt (\$)	279,052 (1,106,377)
NF_DEBT	Total nonfarm debt (\$)	76,948 (275,361)
OP_AGE	Operator age (years)	56.06 (12.61)
FR_ACRES	Total operated acres	1,606 (9,826)
F_SLMR	Limited resource farm ² (=1 if farm classified as limited resource farm, 0 otherwise)	0.06
F_SLOWER	Farming occupation/lower-sales ³ (=1 if farm classified as lower sales farm, 0 otherwise)	0.12
F_SHIGHER	Farming occupation/higher-sales ⁴ (=1 if farm classified as lower sales farm, 0 otherwise)	0.07
F_SLARGE	Large farms, with sales between \$250,000 and \$499,999 (=1 if farm classified as large farm, 0 otherwise)	0.09
F_SVLARGE	Very large farms, with sales of \$500,000 or more (=1 if farm classified as large farm, 0 otherwise)	0.32
FR_CGRAIN	=1 if farm specializes in cash grains	0.20
SH_GOVCAH	Government payments/gross cash farm income	0.07
OP_OFFARM	=1 if the operator works of the farm, 0 otherwise	0.31
SP_OFFARM	=1 if the spouse works of the farm, 0 otherwise	0.38
R_HRTLAND	=1 if farm located in the Heartland region, 0 otherwise	0.18
R_NCRESCNT	=1 if farm located in the Northern Crescent region, 0 otherwise	0.15
R_NGPLAINS	=1 if farm located in the Northern Great Plains region, 0 otherwise	0.06
R_PGATWAY	=1 if farm located in the Prairie Gateway region, 0 otherwise	0.11
R_EUPLANDS	=1 if farm located in the Eastern Uplands region, 0 otherwise	0.11
R_SSBOARD	=1 if farm located in the Southern Seaboard region, 0 otherwise	0.14
R_FRIM	=1 if farm located in the Fruitful Rim region, 0 otherwise	0.17
R_BARANGE	=1 if farm located in the Basin and Range region, 0 otherwise	0.05
R_MPORTAL	=1 if farm located in the Mississippi Portal region, 0 otherwise	0.05
Y_2007	=1 if Year =2007, 0 otherwise	0.33
Y_2008	=1 if Year =2008, 0 otherwise	0.33
Y_2009	=1 if Year =2009, 0 otherwise	0.34
N	Sample size	18,903

¹Only continuous variables.

²Any small farm with gross sales less than \$100,000, total farm assets less than \$150,000, and total operator household income less than \$20,000. Limited-resource farmers may report farming, a nonfarm occupation, or retirement as their major occupation.

³Defined as small farms with sales less than \$100,000 whose operators report farming as their major occupation (excludes limited-resource farms whose operators report farming as their major occupation).

⁴Defined as small farms with sales between \$100,000 and \$249,999 whose operators report farming as their major occupation.

Source: Agricultural Resource Management Survey, 2007-2009, U.S. Department of Agriculture.

Table 2: Determinants of farm debt by farm households in the US, 2007-2009: Heckman two-step selection model

Variable	Farm Debt Probit Model		Level of Farm Debt		
	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Elasticity
Constant	1.21355***	0.18151	259432.40***	78755.98	-
OP_AGE	0.00911***	0.00226	-5621.56***	781.60	1.023
LN_FR_ACRES	0.08408***	0.01817	57320.21***	5799.30	1.028
SH_GOVCASH	0.22777	0.16416	-130214.00***	44054.16	-0.030
F_SLMR	-0.21210**	0.10400	-5354.24	38833.28	0.001
F_SLOWER	-0.04644	0.08962	-28524.35	28412.95	-0.012
F_SHIGHER	0.18760	0.12989	-30293.44	35769.78	-0.008
F_SLARGE	0.20469	0.12449	51108.93	34544.01	0.016
F_SVLARGE	0.23369***	0.09786	485828.10***	28568.26	0.532
FR_CGRAIN	-0.20478***	0.07970	-149141.60***	23676.76	-0.097
Y_2007	0.08047	0.07193	-76252.91***	19925.01	-0.080
Y_2008	-0.07665	0.06519	-21163.45***	19813.57	-0.022
OP_OFFARM	0.18539***	0.07519	-24277.97	22222.71	-0.026
SP_OFFARM	0.08976	0.06166	-91487.77***	17792.14	-0.116
R_NCRESCENT	0.26679***	0.11146	-	-	-
R_NGPLAINS	0.20198	0.17098	-	-	-
R_PGATEWAY	-0.18458*	0.10002	-	-	-
R_EUPLANDS	0.22169*	0.12103	-	-	-
R_SSEABOARD	0.01981	0.09934	-	-	-
R_FRIM	0.09549	0.10209	-	-	-
R_BARANGE	-0.00402	0.14095	-	-	-
R_MPORTAL	-0.35598***	0.10923	-	-	-
Inverse Milles Ratio (IMR)			-1,053,602*	622,755	
N	18,903				
Censored observations	196				
Wald χ^2 (13)	1359.82				
Prob > χ^2	0.0000				

*, **, *** indicate statistical significance at the 10, 5, and 1 percent level of significance.

**Table 3: Determinants of nonfarm debt by farm households in the US, 2007-2009:
Heckman two-step selection model**

Variable	Nonfarm Debt Probit Model		Level of nonfarm Debt		
	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Elasticity
Constant	1.05488***	0.06710	42145.66***	26169.31	-
OP_AGE	-0.02000***	0.00083	2545.60***	581.37	0.454
LN_FR_ACRES	-0.03754***	0.00637	17938.21***	2598.33	0.316
SH_GOVCASH	0.12700***	0.05237	-56370.79***	21737.73	-0.123
F_SLMR	-0.49592***	0.04665	42144.02	27188.26	0.008
F_SLOWER	0.07353**	0.03348	-14816.29	14023.43	-0.006
F_SHIGHER	0.01359	0.04115	-1102.33	17323.79	-0.0003
F_SLARGE	0.14905***	0.03961	22575.89	16664.70	0.007
F_SVLARGE	0.22654***	0.03263	73063.07***	14423.45	0.076
FR_CGRAIN	-0.08661***	0.02728	-21197.87*	11196.01	-0.013
Y_2007	-0.12276***	0.02329	31836.02***	10141.56	0.033
Y_2008	0.07926***	0.02309	22284.50***	9570.25	0.023
OP_OFFARM	0.20940***	0.02482	37311.47***	11016.01	0.039
SP_OFFARM	0.20463***	0.02038	-48362.23***	9248.95	-0.060
R_NCRESCENT	0.13149***	0.03414	-	-	-
R_NGPLAINS	0.07657*	0.04630	-	-	-
R_PGATEWAY	0.07884**	0.03733	-	-	-
R_EUPLANDS	-0.14601***	0.03792	-	-	-
R_SSEABOARD	0.03428	0.03480	-	-	-
R_FRIM	0.42018***	0.03501	-	-	-
R_BARANGE	0.30131***	0.04983	-	-	-
R_MPOTAL	0.21038***	0.04741	-	-	-
Inverse Milles Ratio (IMR)			-217922***	38542.82	
N	18,903				
Censored observations	9207				
Wald χ^2 (13)	277.94				
Prob > χ^2	0.0000				

*, **, *** indicate statistical significance at the 10, 5, and 1 percent level of significance.