Decomposition of Variability in Assets and Debt of Farm Households in the United States

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Abstract

The study measures how much of the variability in farm household assets and debt are attributed to the variability in farm and non-farm assets and farm and non-farm debt. Using a normalized variance decomposition approach and data from the Agricultural Resource Management Study (ARMS) survey, results show that origin of assets and debt variability differs with farm size and location of the farm household.

Key words: Variance decomposition, farm households, assets, debt, and variability.

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Policy analysts, farm investors, and lenders are among those interested in monitoring and forecasting the economic well-being of the farm sector and farm households. Historically, most attention has focused on farm incomes. Over the past six decades a variety of agricultural programs, such as price supports and production control have been used to enhance farm income of farm households. In fact social fairness or economic equity was one of the arguments of these transfer payments (Halcrow, Robinson). However, a true evaluation of economic equity must include a measure of wealth (Hill). Wealth is a shadowy but potent component among the factors that determine the position of the agricultural community. Why should we be concerned with wealth? Because economic well-being is affected by wealth. Two individuals with low money incomes, one with substantial wealth, the other having little, would be economically dissimilar. Yet, in most income statistics, the two would be lumped together.

Further, because of accounting practices, tax laws, and more income being derived from off-farm sources, farm income may be a poor indicator of the economic well-being of particular farm households. Farm families often hold large quantities of wealth. The average net worth of farm families in the United States in 1998 was about twice that of all U.S. families and related individuals. The average net worth of all U.S. families and related individuals in 1998 (most recent) was $282,500 (Kennickell et al.) The average net worth of all U.S. farm families was $492,195 (Agricultural Resource Management Study, 1998, USDA).

Ahearn and El-Osta, using data from the 1988 Farm Costs and Returns Survey (FCRS) in conjunction with published 1988 data from the U.S. Department of Commerce compared the wealth distribution of U.S. farm businesses to that of all U.S. households. Their results showed that not only was wealth greater for farm businesses, it was also more equally distributed than among U.S. households. Weldon et al. point to the importance of factors such as farm income, government payments, and increased off-farm income in generating a more favorable wealth distribution. Although these studies did not examine the issue of decomposition of wealth into its two components (farm and non-farm assets), they nonetheless provide substantive discussion on the subject of the origins of farm wealth and of corresponding implications for public policy. One way households assess their financial progress is to periodically review their net worth position, that is, the difference between their assets and liabilities (debt).

Given the importance of assets and debt, determining sources of variability in assets and debt of farm households will contribute to: (1) understanding of policies that influence income and underpin farm real estate values and risk management accounts; (2) the vulnerability of farm businesses and farm households to changes in the general economy versus changes in agricultural prices (both inputs and outputs) will be influenced by the degree to which the farm business and farm household are diversified; (3) a better understanding of the economics of farms can be achieved by identifying the impact of off-farm investment on the financial success of the farm business and household income; and (4) the whole issue of retirement planning and the life cycle behavior of farmers will be influenced by a better understanding of whether or not land (or potential capital gains on its sale) is the primary retirement holding of farmers. Therefore, it is the objective of this study to measure how much of the variability in total farm operator household assets and debts (farm and nonfarm) is due to each of its components. In particular we examine the variability in farm household assets and debts for 1996 and 1999. The analysis is conducted by size (farm typology) and location of the farming operation (farming region). Farm assets includes land and buildings (real estate), farm equipment, and other farm assets, whereas non-farm assets includes savings, 401K accounts, retirement, SEP and Keogh Plans, stocks and bonds, and other off-farm investments[1]. This objective will be accomplished using the method of normalized variance decomposition.

Background

Various studies have examined the contribution of income from off-farm sources to the distribution of total personal income of farm operator households (Bryant and Zick; Ahearn, Johnson, and Strickland; Reddy, Findies, and Hallberg; El-Osta, Bernat, and Ahearn). Mishra and El-Osta presented the first study that investigated the sources of variability in total farm household income (farm and non-farm income). They concluded that source of variability in total household dependent on the major source of income. For example, if the household derived majority of their income from farming then larger portion of variability originated from farm income. If the household derived majority of their income form off-farm sources then larger portion of variability originated from off-farm income. All of the above studies focus on the distribution of income or variability in total household income. However, no attention is given to the sources contributing to the variability in farm household assets and debts. One study that comes to mind, although not similar, is Weldon et al. study of farm sector wealth. The authors examine inequality in farm sector wealth (1960-991) using Theil's measure of inequality (Entropy). Further, they decompose the inequality into between and within-region inequalities.

[1] The 1996 Agricultural Resource Management Study (ARMS) survey does not contain a detailed non-farm assets information like the one in 1999 ARMS. Therefore, non-farm asset is all lumped together.

They conclude that wealth in U.S. is much more evenly distributed in post 1980s era when compared to pre 1960 era.

Our study is different in many ways. First, we are using farm household level data. Second, we are decomposing the variability in household assets and debts through its components. Third, the data contains more information, i.e., we have information on farm and non-farm assets and debts. Finally, we have two different years, 1996 and 1999 to compare the sources of variability in farm household asserts and debts. The amount of assets and debt held by households and the rates at which they accumulate it are important indicators of family economic well-being and financial progress. Furthermore, the forms in which wealth is held provide a good measure of how responsive households can be in meeting financial crises.

Decomposing Household Asset and Debt

Total assets of farm household are includes farm and non-farm assets. Farm assets include land and buildings (real estate), farm equipment, and other farm assets. Non-farm assets (for 1999) include savings (checking, money markets, and savings bond) accounts, retirement (IRA, SEP, 401K, and Keogh Plans) accounts, corporate stocks, mutual funds, and other off-farm investments.

To minimize the variability in farm operator household's assets and debts in each of the subgroups (farm typology, and region), the factors are identified that contribute the most to the variance of total assets and debt. To determine this, let total assets[2] of the ith farm operator household ($TASST_i$) be described as in the following:

$$TASST_i = \sum_{g=1}^{k} X_{g,i}, \qquad (i=1 \ldots n), \tag{1}$$

where X_1,..., X_4 are real estate, farm equipment, and other farm assets and non-farm assets including savings (checking, money markets, and savings bond), accounts, retirement accounts (IRA, SEP, 401K, and Keogh Plans), corporate stocks and mutual funds, and other off-farm investments. The variability in *TASST* is measured as:

$$\sigma_{TASST} = \begin{bmatrix} \sigma_{11} + \sigma_{12} + \sigma_{13} \ldots\ldots + \sigma_{1k} + \\ \sigma_{21} + \sigma_{22} + \sigma_{23} \ldots\ldots + \sigma_{2k} + \\ \sigma_{31} + \sigma_{32} + \sigma_{33} \ldots\ldots + \sigma_{3k} + \\ . \\ \sigma_{k1} + \sigma_{k2} + \sigma_{k3} \ldots\ldots + \sigma_{kk} \end{bmatrix}, \tag{2}$$

where Φ_{TASST} is the weighted variance of *TASST*, and Φ_{gg} and Φ_{gh} (g h) are the weighted variance of component X_g ($g = 1,.., k$) and the weighted covariance of components X_g and X_h, respectively. The variability of *TASST* as described in equation 2 is approximated by the sum of variance-covariance effects attributed to the components of *TASST*.

The relative importance of the additive components of *TASST* to the variability in *TASST* is measured by:

$$\begin{aligned} C_1 &= \left(\sigma_{11} + \sigma_{12} + \sigma_{13} \ldots. + \sigma_{1k}\right) / \sigma_{TASST} \\ C_1 &= \left(\sigma_{21} + \sigma_{22} + \sigma_{23} \ldots. + \sigma_{2k}\right) / \sigma_{TASST} \\ . &= \left(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\right) \qquad , \\ . &= \left(\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\right) \\ C_k &= \left(\sigma_{k1} + \sigma_{k2} + \sigma_{k3} \ldots. + \sigma_{kk}\right) / \sigma_{TASST} \end{aligned} \tag{3}$$

[2] A similar analytical framework is constructed for the debt side of the household. We will present the asset side of the household balance sheet.

where $C_1, \ldots, C_k$ are relative measures of the contribution of household asset components to the normalized variance of *TASST* (Φ_{TASST}), respectively. The summation of these relative measures yields unity as in[3]:

$$\Phi_{TASST} = \sum_{g=1}^{8} C_g = 1. \tag{4}$$

Because any particular asset component X_g ($g = 1, \ldots, k$) may be negatively correlated with some or all of the other asset components, it is possible that some of the C_g will be negative. This can happen when the value reflecting the sum of the correlations Φ_{gh} ($g \quad h$) is negative and its absolute value is larger than Φ_{gg}.

Data Description

The source of the data is the 1996 and 1999 Agricultural Resources Management Study (ARMS). The 1996 ARMS was chosen because that year marks the beginning of the Freedom to Farm Act. The 1999 ARMS is the most current survey available and also has additional information on the components on non-farm assets. The ARMS, conducted annually by the Economic Research Service and the National Agricultural Statistics Service, uses a multi-phase sampling design and allows each sampled farm to represent a number of farms that are similar, the number of which being the survey expansion factor (see Kott; Dubman for more technical detail). The expansion factor, in turn, is defined as the inverse of the probability of the surveyed farm being selected. Further, the ARMS collects data to measure the financial conditions (farm income, expenses) and operating characteristics of farm businesses, the cost of producing agricultural commodities, and the well-being of farm operator households.

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[3] The method described here is an adaptation of the method of coefficient of separate determination (see Ezekiel and Fox; Burt and Finley).

The U.S. farm sector consists of a highly diverse set of businesses and farm households committed to living in rural areas and engaging in farm economic activities. Since the early 1900's USDA analysts have sought to identify patterns in U.S. farming that might further the understanding of differences in financial performance of farms and the economic well-being of farm households. The climatic, soil, water, and typographical base of geographic areas tend to constrain the number and types of crops and livestock that are well adapted. County clusters, based on types of commodity produced, have shown that a select few commodities tend to dominate the production landscape of geographic areas that cut across traditional political boundaries. To more carefully capture differences among farms and farm households, two classifications of farms have been developed to reflect resource, economic, and demographic attributes of farms and areas. These classifications, one a resource-based regional delineation, and the second a farm typology based on sales volume, assets, and occupational choice provide more homogenous groupings of farms and farm households. The regions used in this study merge information about characteristics of land areas with information about types of commodity produced to generate geographic areas that, while cutting across state boundaries, are more homogenous with regard to both resource and production activities. Based on this classification we have 9 regions.

Results

Tables 1-4 present the decomposition of variance in farm household assets for 1996. In general, for all farm households majority of the variability (almost 80%) in farm household assets originates from real estate (Table 1). However, the source of variability changes once the farm size is taken into consideration. For example, in the case of limited resource and retirement farm households variability in non-farm assets play an important role in assets variability. This is not surprising since off-farm income contributes significantly more to the total household income. Further, the results are consistent with the findings of Mishra, El-Osta, and Steele. Results show that farm households that have farming as their main occupation (farming occupation-higher sales, large, and very large farms) variability in real estate is major contributor to variability in household assets. On the debt side, Table 2 shows that for farm households, such as farming occupation-higher sales, large farms, and very large farms, real estate (value of land and building) and long-tern debt contribute most to the variability in farm household debt. However, for limited resource and residential farm households' non-farm debt (46% and 48%, respectively) is the major contributor to the variability in total debt. The results are consistent with the fact that non-farm debt is major source of debt for limited and residential farm households. Further, non-farm debt plays an important role in the variability of total debt for the retirement (28%) and farming occupation-lower sales (25%) households.

A similar analysis was conducted for farm household located in 9 different regions of the U.S. The results in Table 3 show that in the Heartland region, considered as the farming region, a large proportion (50%) of the variability in household assets originates from real estate (value of land and building). Further, non-farm assets contribute about 16% in the household asset variability. Results are similar for the Mississippi Portal region. However, farm households located in the Eastern Uplands and Southern Seaboard have one-fourth of the variability in assets originating from non-farm assets. On the debt side, Table 4 shows that in the Heartland, Northern Crescent, Northern Great Plains, and Prairie Gateway have larger portion of debt variability originating from real estate and long-term debt. However, non-farm debt contributes one-third (30%) in the farm household debt variability.

The results for the 1999 ARMS data analysis are little different in two ways (Table 5-8). First, we have more information on the types of non-farm assets[4] held by farm households. Second, we observe a small change in the variability originating from farm assets (real estate, farm equipment, other financial assets[5], and other assets[6]). In general, we observe that all farm households regardless of size have invested and taken advantage of the booming non-farm economy. Variability in household assets originating from non-farm assets nearly tripled, increasing from nearly 5% in 1996 to nearly 14% in 1999. Results indicate that for all farms in 1999 variability in assets originated primarily from the value of land and buildings (at 71%) followed by the value of other farm assets (6%), and finally equally through changes in the value of farm equipment, other farm financial assets. Non-farm assets such as stocks and mutual funds, CDs, IRA, and other non-farm financial assets are equally important. However, origin of variability in farm household assets differs by farm size. For example, variability in assets of limited resource farms is much more affected by variability in non-farm assets, more than 85%, (other non-farm assets, 59%; stocks and mutual funds 10%, followed by money market and cash accounts and retirement accounts 8% each) than variability in the value of land and buildings. On the other hand, variability in the value of land and buildings is the major factor affecting

[4] Cash, checking, money market, and CDs accounts, saving bonds and other bonds. Retirement accounts such as IRA, Keogh, 401K, SEP Plans. Corporate stocks, mutual funds, and cash value of life insurance. Other non-farm assets such as off-farm houses, real estate and businesses not part of the farm, recreational vehicles, and others.

[5] Other current assets, prepaid insurance, and investment in cooperatives.

[6] Includes current assets such as livestock for breeding, livestock & crop inventory, purchased inputs, and inputs for crops planted but not harvested.

variability in the assets of large (75%) and very large family farms (84%) and variability in non-farm assets accounts for 10% and 1% respectively.

In the case of small farm households (Limited Resource, Retirement, Residential, Farming occupation-lower sales, and Farming occupation-higher sales) a larger proportion of the variability in total household assets originated from non-farm assets (Table 5). For example, in the case of Limited Resource farms variability in assets form non-farm increased from 70% in 1996 to 85% in 1999. Similarly, for residential farms non-farm assets contributed more than 50% in household asset variability in 1999. The variability from non-farm assets almost doubled during 1996-1999 (25% in 1996 to 51% in 1999). On the other hand, the portion of variability in total household debt originating from non-farm debt, all farms, decreased from approximately 10% in 1996 to approximately 2% in 1999, an 80% decrease (Table 6). A similar pattern emerges across the farm typolgy. For instance, the portion of variability in total household debt, for residential farm households, originating from non-farm debt, all farms, decreased from approximately 48% in 1996 to approximately 8% in 1999. Across all farm households we observe that the major portion of variability in total household debt originates from real estate (value in land and building) and long-term debt.

When decomposing sources of variability in farm household assets and debts by region for 1999, results show a similar pattern as for the farm typology (Table 7). In the case of farm household assets, the contribution of non-farm assets to the overall variation in farm household assets rose from approximately 5% in 1996 to 14% in 1999. The contribution of non-farm asset variability in total assets more than doubled for farm households located in the Northern Crescent, Northern

Plains, Prairie Gateway, Fruitful Rim, Basin and Range, and Mississippi Portal. Further, farm households located in the Eastern Uplands and Southern Seaboard observed an increased variability in their assets due to increased variability in non-farm assets (40% and 38%). On the other hand, in general results show a decrease in the portion of variability in household assets originating from real estate and other assets when compared to 1996 levels.

In the case of farm household debts (Table 8) results show that a very small portion of the variability in farm household debt originates from non-farm debt. In fact the contribution dropped significantly from approximately 10% in 1996 to 2% in 1999. It is surprising to note that variability in debts contributed by non-farm debt, for farms located in Eastern Uplands and Southern Seaboard, decreased considerably from 1996 level. Results show that variability in farm household debts, in all regions, increased as a result of increased variability in real estate and long-term debt when comparing to 1996 levels.

Conclusions

In spite of having low farm income, many farm families have a substantial amount of wealth or net worth (including farm and non-farm sources). Net worth comprise total assets minus total debt. On average the value of total assets (farm and non-farm[7]) increased from $473,166 in 1996 to $633,524 in 1999, a 34% increase. On the other hand, total debt (farm and non-farm) increased from $68,718 in 1996 to $69,962 in 1996, only 2% increase. Understanding sources of variability in assets and debt and how variability may affect the well-being of farm families is an issue for public policymakers.

[7] On average the value of non-farm alone increased 113% during 1996-1999. The value of non-farm assets increased from $92,738 in 1996 to $198,087 in 1999.

The purpose of this study was to measure variability in farm operator household assets and debt related to each of its components by farm typology and farming regions. The analysis used cross-sectional data from the 1996 and 1999 ARMS surveys and the method of normalized variance decomposition. The results show that farm operator households are heterogeneous with respect to their reliance and distribution of farm and non-farm assets and debt. The results presented here support this and highlight how the source of variability in farm household assets and debt varies across farm typology and farming region. Additionally, recent data (ARMS, 1999) show that farm household have broadened their portfolio to include a variety of off-farm assets.

Results from this study also point to the complexity of any policy action/recommendation aimed at minimizing the variability in farm household assets and debt. In other words, the fact that farm households are so diverse in their resource base, means that no one policy action focused on the economic well-being of farm households will be suitable for all households. Rather, a targeted policy might be warranted.

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Defining the Farm Typology

Small Family Farms
(sales less than $250,000)

- **Limited-resource farms.** Small farms with sales less than $100,000, farm assets less than $150,000, and total operator household income less than $20,000. Operators may report any major occupation, except hired manager.

- **Retirement farms.** Small farms whose operators report they are retired.*

- **Residential/lifestyle farms.** Small farms whose operators report a major occupation other than farming.*

Farming-occupation farms. Small farms whose operators report farming as their major occupation.*
- **Low-sales.** Sales less than $100,000.
- **High-sales.** Sales between $100,00 and $249,999.

Other Farms

- **Large family farms.** Sales between $250,000 and $499,999.

- **Very large family farms.** Sales of $500,000 or more.

- **Nonfamily farms.** Farms organized as nonfamily corporations or cooperatives, as well as farms operated by hired managers.

*Excludes limited-resource farms whose operators report this occupation.

Figure 1: Economic Research Service Farm Typology

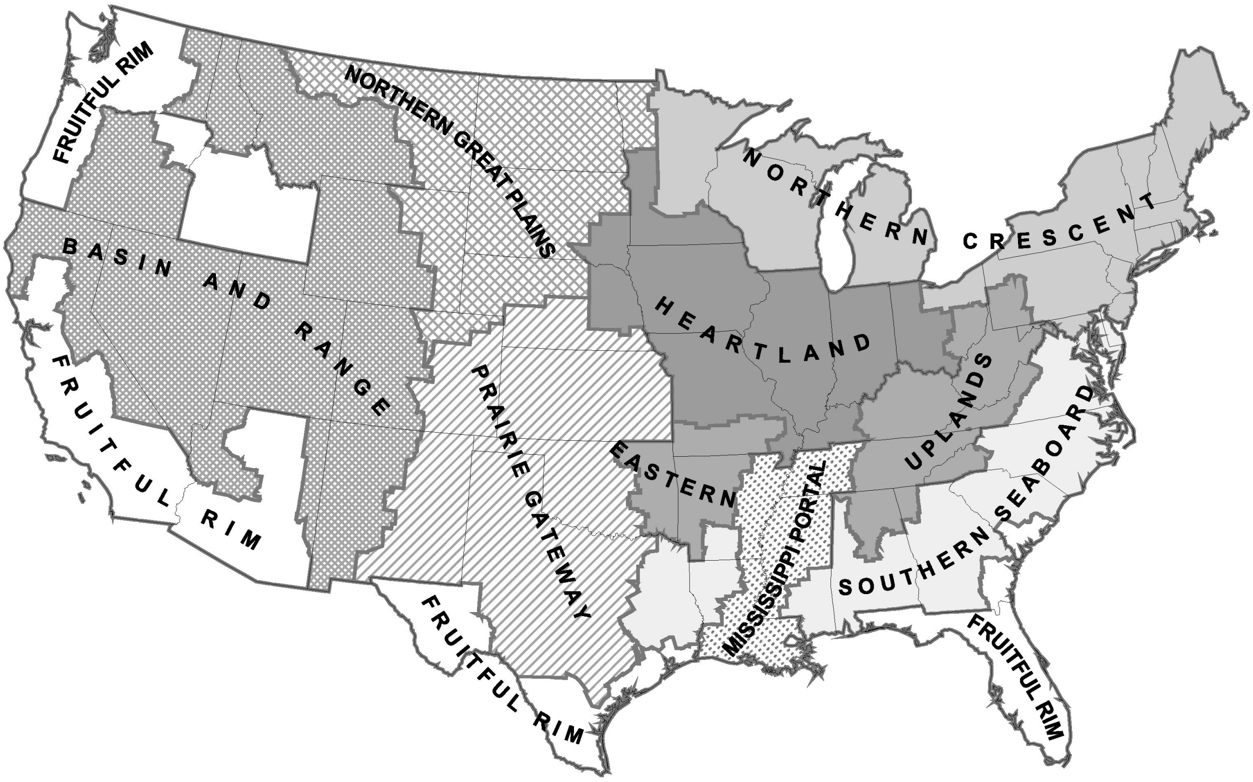

Figure 2. U.S. Farm Resource Regions

Table 1: Normalized Variance Decomposition of Farm Operator Household Assets (Farm and Non-farm) by Farm Typolgoy, 1996

Sources of Asset	Limited Resource	Retirement Lifestyle Farms	Residential Farms	Farming Occupation-Lower-sales	Farming Occupation-Higher-sales	Large Farms	Very Large Farms	All Farms
				Percent				
				Farm Assets				
Real Estate[1]	23.50	37.12	70.02	69.30	79.40	67.02	87.84	79.64
Farm Equipment[2]	2.07	2.41	1.70	3.05	4.33	8.04	4.44	5.48
Other Financial Assets[3]	1.80	22.63	1.04	10.07	5.17	8.48	1.23	3.13
Other Assets[4]	2.75	2.06	1.91	4.35	3.66	8.07	6.59	7.02
				Non-farm Assets				
Non-farm Assets[5]	69.87	35.75	25.32	13.23	7.43	8.38	0.47	4.72
Total	100.00	100.00	100.00	100.00	100.00	100.0	100.00	100.00

Source: Agricultural Resource Management Study (ARMS) Survey, Economic Research Service, USDA, 1996.

[1] Includes land and buildings.
[2] Tractors, trucks, implements, and other equipment.
[3] Other current assets, prepaid insurance, and investment in cooperatives.
[4] Includes current assets such as livestock for breeding, livestock & crop inventory, purchased inputs, and inputs for crops planted but not harvested.
[5] Includes investments in CDs, savings, money market accounts, stocks, household cars and trucks, and other financial assets.

Table 2: Normalized Variance Decomposition of Farm Operator Household Debt (Farm and Non-farm) by Farm Typolgoy, 1996

Sources of Debt	Limited Resource	Retirement Farms	Residential Lifestyle Farms	Farming Occupation-Lower-sales	Farming Occupation-Higher-sales	Large Farms	Very Large Farms	All Farms
				Percent				
				Farm Debt				
Real Estate[1]	24.45	32.99	22.41	31.71	38.06	31.74	39.61	34.69
Non-Real Estate	2.26	2.35	3.95	3.56	7.95	4.61	8.72	7.60
Short-term debt[2]	3.44	4.12	2.43	7.63	7.68	24.08	7.28	9.98
Long-term debt[3]	24.30	32.26	23.68	31.98	41.17	32.83	43.25	37.79
				Non-farm Debt				
Non-farm debt[4]	45.56	28.27	47.52	25.11	5.14	6.72	1.15	9.93
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Agricultural Resource Management Study (ARMS) Survey, Economic Research Service, USDA, 1996.

[1] Debt on land and buildings.
[2] Loans less than 1 year, accrued interest, accounts payable, current portion of term debt.
[3] Non-current real and non-real estate debt.
[4] Non-farm debt of the farm household.

Table 3: Normalized Variance Decomposition of Farm Operator Household Assets (Farm and Non-farm) by Farming Region, 1996

Sources of Asset	Heartland	Northern Crescent	Northern Great Plains	Prairie Gateway	Eastern Uplands	Southern Seaboard	Fruitful Rim	Basin and Range	Mississippi Portal	All Farms
					Percent					
					Farm Assets					
Real Estate[1]	49.58	70.64	57.19	70.85	57.28	52.59	87.50	70.52	42.67	79.64
Farm Equipment[2]	10.79	7.10	9.80	5.47	5.93	7.63	4.42	7.38	11.27	5.48
Other Financial Assets[3]	13.99	5.97	7.92	4.80	2.01	5.77	1.33	3.95	8.43	3.13
Other Assets[4]	9.85	5.86	16.41	11.16	9.11	8.12	5.58	9.23	24.18	7.02
					Non-farm Assets					
Non-farm Assets[5]	15.78	10.42	8.66	7.73	25.65	25.88	1.15	8.92	13.44	4.72
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Agricultural Resource Management Study (ARMS) Survey, Economic Research Service, USDA, 1996.

[1] Includes land and buildings.
[2] Tractors, trucks, implements, and other equipment.
[3] Other current assets, prepaid insurance, and investment in cooperatives.
[4] Includes current assets such as livestock for breeding, livestock & crop inventory, purchased inputs, and inputs for crops planted but not harvested.
[5] Includes investments in CDs, savings, money market accounts, stocks, household cars and trucks, and other financial assets.

Table 4: Normalized Variance Decomposition of Farm Operator Household Debt (Farm and Non-farm) by Farming Region, 1996

Sources of Debt	Heartland	Northern Crescent	Northern Great Plains	Prairie Gateway	Eastern Uplands	Southern Seaboard	Fruitful Rim	Basin and Range	Mississippi Portal	All Farms
					Percent					
					Farm Assets					
Real Estate[1]	36.12	30.73	35.29	33.53	31.07	24.58	37.44	35.75	22.84	34.69
Non-Real Estate	6.45	9.14	6.48	9.02	1.53	8.55	7.29	4.51	22.86	7.60
Short-term debt[2]	11.19	9.15	15.13	12.38	7.52	7.48	9.05	13.84	10.07	9.98
Long-term debt[3]	38.23	35.28	37.50	37.80	29.87	29.16	40.12	36.44	38.35	37.79
					Non-farm Assets					
Non-farm debt[4]	8.02	15.70	5.59	7.26	30.00	30.22	6.08	9.46	5.88	9.93
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Agricultural Resource Management Study (ARMS) Survey, Economic Research Service, USDA, 1996.

[1] Debt on land and buildings.
[2] Loans less than 1 year, accrued interest, accounts payable, current portion of term debt.
[3] Non-current real and non-real estate debt.
[4] Non-farm debt of the farm household.

Table 5: Normalized Variance Decomposition of Farm Operator Household Assets (Farm and Non-farm) by Farm Typolgoy, 1999

Sources of Asset	Limited Resource	Retirement Farms	Residential Lifestyle Farms	Farming Occupation-Lower-sales	Farming Occupation-Higher-sales	Large Farms	Very Large Farms	All Farms
				Percent				
				Farm Assets				
Real Estate[1]	12.18	44.16	42.21	67.74	72.21	74.65	83.74	71.03
Farm Equipment[2]	1.73	1.46	2.13	2.64	5.11	3.24	4.53	4.97
Other Financial Assets[3]	-0.01	4.65	2.79	5.98	3.76	4.46	3.90	4.28
Other Assets[4]	0.43	1.08	1.83	2.05	4.40	5.97	6.45	6.10
				Non-farm Assets				
Non-farm Assets_1[5]	8.29	10.44	8.96	6.27	3.78	2.62	0.31	2.83
Non-farm Assets_2[6]	8.67	10.35	12.05	5.00	2.47	2.31	0.18	2.89
Non-farm Assets_3[7]	10.16	12.77	11.65	5.40	5.27	3.90	0.46	3.56
Non-farm Assets_4[8]	58.61	15.08	18.40	4.92	3.00	2.85	0.42	4.32
Total	100.00	100.00	100.00	100.00	100.00	100.0	100.00	100.00

Source: Agricultural Resource Management Study (ARMS) Survey, Economic Research Service, USDA, 1999.

[1] Includes land and buildings.
[2] Tractors, trucks, implements, and other equipment.
[3] Other current assets, prepaid insurance, and investment in cooperatives.
[4] Includes current assets such as livestock for breeding, livestock & crop inventory, purchased inputs, and inputs for crops planted but not harvested.
[5] Cash, checking, money market, and CDs accounts, saving bonds and other bonds.
[6] Retirement accounts such as IRA, Keogh, 401K, SEP Plans.
[7] Corporate stocks, mutual funds, and cash value of life insurance.
[8] Other non-farm assets such as off-farm houses, real estate and businesses not part of the farm, recreational vehicles, and others.

Table 6: Normalized Variance Decomposition of Farm Operator Household Debt (Farm and Non-farm) by Farm Typolgoy, 1999

Sources of Debt	Limited Resource	Retirement Farms	Residential Lifestyle Farms	Farming Occupation-Lower- sales	Farming Occupation-Higher-sales	Large Farms	Very Large Farms	All Farms
				Percent				
				Farm Debt				
Real Estate[1]	39.68	31.05	40.12	41.25	45.94	39.32	40.69	39.87
Non-Real Estate	5.43	10.79	6.50	5.33	4.16	7.66	3.20	5.19
Short-term debt[2]	4.74	3.70	2.83	5.32	3.66	10.42	15.67	12.29
Long-term debt[3]	40.76	36.83	42.06	42.14	45.59	42.09	40.24	40.74
				Non-farm Debt				
Non-farm debt[4]	9.38	17.62	8.39	5.94	0.63	0.51	0.19	1.91
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Agricultural Resource Management Study (ARMS) Survey, Economic Research Service, USDA, 1999.

[1] Debt on land and buildings.
[2] Loans less than 1 year, accrued interest, accounts payable, current portion of term debt.
[3] Non-current real and non-real estate debt.
[4] Non-farm debt of the farm household.

Table 7: Normalized Variance Decomposition of Farm Operator Household Assets (Farm and Non-farm) by Farming Region, 1999

Sources of Asset	Heartland	Northern Crescent	Northern Great Plains	Prairie Gateway	Eastern Uplands	Southern Seaboard	Fruitful Rim	Basin and Range	Mississippi Portal	All Farms
					Percent					
					Farm Assets					
Real Estate[1]	58.10	62.48	55.88	62.19	48.66	51.04	81.27	69.35	58.28	71.03
Farm Equipment[2]	8.47	5.20	8.42	4.64	3.55	4.00	4.50	4.46	8.84	4.97
Other Financial Assets[3]	5.18	4.70	4.77	6.05	4.20	2.90	4.00	2.05	5.45	4.28
Other Assets[4]	7.93	5.94	10.34	8.79	3.59	4.21	5.54	6.53	7.17	6.10
					Non-farm Assets					
Non-farm Assets_1[5]	4.80	3.17	3.39	5.03	7.31	9.6	0.95	3.06	4.55	2.83
Non-farm Assets_2[6]	4.44	4.96	2.92	4.44	7.49	7.25	1.16	1.98	4.57	2.89
Non-farm Assets_3[7]	4.84	5.59	6.23	4.85	10.11	11.94	1.26	2.94	5.89	3.56
Non-farm Assets_4[8]	6.25	7.98	8.04	3.95	15.09	9.08	1.33	9.62	4.25	4.32
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Agricultural Resource Management Study (ARMS) Survey, Economic Research Service, USDA, 1999.

[1] Includes land and buildings.
[2] Tractors, trucks, implements, and other equipment.
[3] Other current assets, prepaid insurance, and investment in cooperatives.
[4] Includes current assets such as livestock for breeding, livestock & crop inventory, purchased inputs, and inputs for crops planted but not harvested.
[5] Cash, checking, money market, and CDs accounts, saving bonds and other bonds.
[6] Retirement accounts such as IRA, Keogh, 401K, SEP Plans.
[7] Corporate stocks, mutual funds, and cash value of life insurance.
[8] Other non-farm assets such as off-farm houses, real estate and businesses not part of the farm, recreational vehicles, and others.

Table 8: Normalized Variance Decomposition of Farm Operator Household Debt (Farm and Non-farm) by Farming Region, 1999

Sources of Debt	Heartland	Northern Crescent	Northern Great Plains	Prairie Gateway	Eastern Uplands	Southern Seaboard	Fruitful Rim	Basin and Range	Mississippi Portal	All Farms
					Percent					
					Farm Assets					
Real Estate[1]	40.16	42.90	36.96	37.56	45.55	38.88	39.61	42.75	38.75	39.87
Non-Real Estate	6.66	5.99	9.98	4.53	3.49	1034	2.85	4.44	6.96	5.19
Short-term debt[2]	9.56	4.78	10.16	16.64	3.53	3.09	17.78	8.67	11.06	12.29
Long-term debt[3]	42.15	44.16	41.69	38.11	44.72	43.74	38.81	42.84	41.07	40.74
					Non-farm Assets					
Non-farm debt[4]	1.47	2.17	1.21	3.16	2.71	3.94	0.95	1.29	2.15	1.91
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Agricultural Resource Management Study (ARMS) Survey, Economic Research Service, USDA, 1999.

[1] Debt on land and buildings.
[2] Loans less than 1 year, accrued interest, accounts payable, current portion of term debt.
[3] Non-current real and non-real estate debt.
[4] Non-farm debt of the farm household.