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United States Department of Agriculture

Economic Research Service

Economic Information Bulletin Number 122

April 2014

Debt Use By U.S Farm Businesses, 1992-2011

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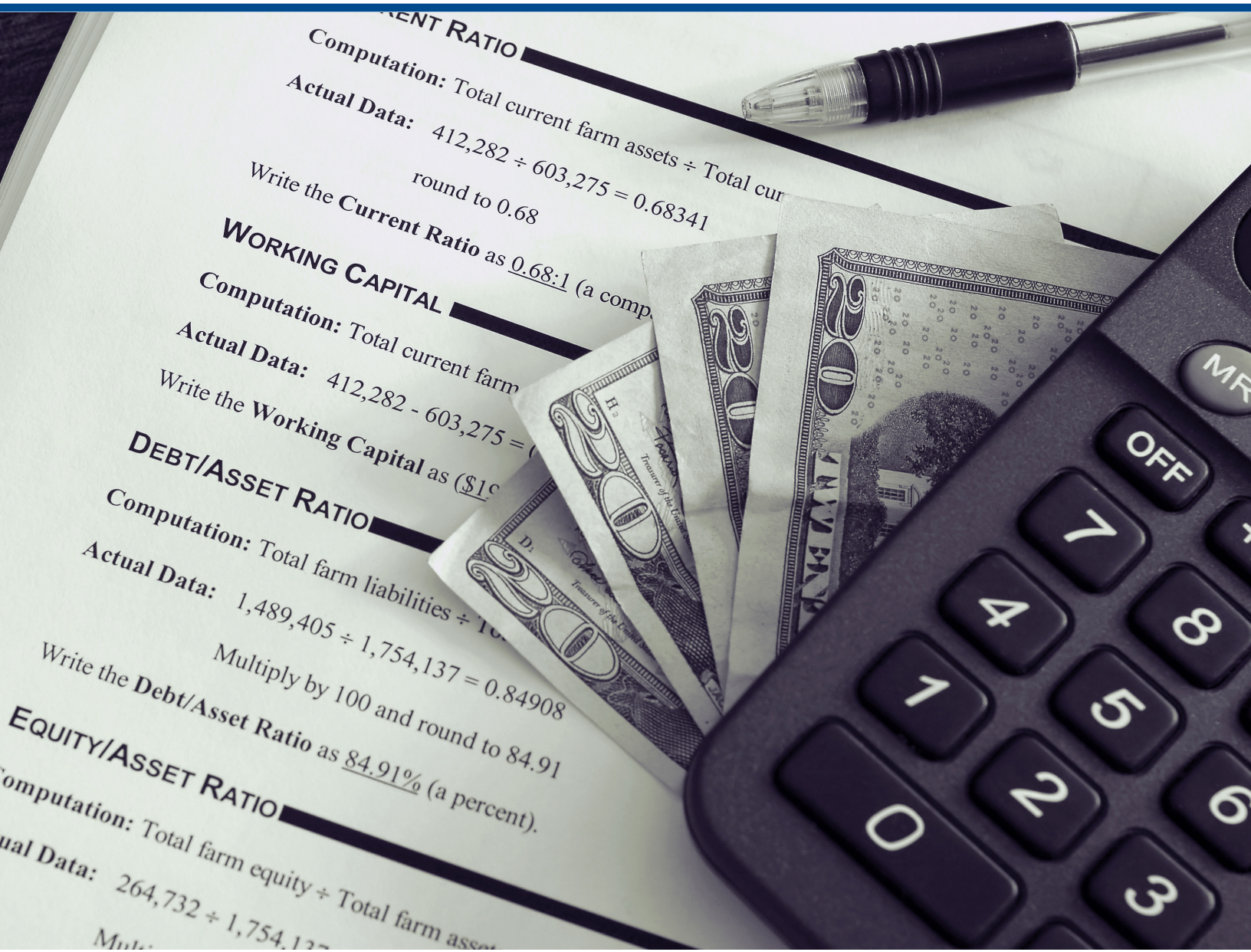
Amirdara Novini
Kevin Patrick



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Debt Use By U.S. Farm Businesses, 1992-2011

Jennifer Ifft, Amirdara Novini, and Kevin Patrick

Abstract

This report is a primer on the use of debt by U.S. farm businesses for policymakers, researchers, and others interested in the financial well-being of U.S. agriculture. It presents data on basic debt-use patterns by farm businesses (in 2011, over 900,000 farms operated as farm businesses based on their size, organizational structure, or the occupation of their principal operator) and explores key trends over 20 years. U.S. farm debt use varies widely by farm size, specialization, operator age, and other farm characteristics. Large-scale farm businesses, farm businesses with younger operators, and dairy and poultry farm businesses all have higher levels of debt use. Both average debt-to-asset ratios and the share of farm businesses with high debt-to-asset ratios have declined over time.

Keywords: Farms, debt, debt-to-asset ratios, commodities, Agricultural Resource Management Survey

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A report summary from the Economic Research Service April 2014

Find the full report at *www.ers.usda.gov/publications/eib-economic-information-bulletin/eib122.aspx*

Debt Use By U.S Farm Businesses, 1992-2011

Jennifer Ifft, Amirdara Novini, and Kevin Patrick

What Is the Issue?

Farm businesses' debt-use decisions can affect their growth and survival, as well as the economic vitality of farm-dependent rural communities. Thus policymakers, agricultural lenders, and other farm-sector participants closely follow trends in farm debt. During the early 1980s, farm income plummeted and interest rates rose rapidly, which contributed to numerous farm bankruptcies and rural bank failures. Today, the farm sector overall is in a strong financial position after several years of generally rising income. However, the potential for lower income and higher interest rates in the future has raised concerns about current trends in the use of debt by farm businesses. This study analyzes how farm businesses used debt from 1992 through 2011, with a focus on the considerable heterogeneity among farm businesses in their debt obligations.

What Did the Study Find?

While total debt held by farm businesses increased 39 percent from 1992 to 2011 (after adjusting for inflation), the average farm business debt-to-asset ratio was 0.13 in 1992, rose to 0.15 in 1997, and declined to 0.09 in 2011. Further, the share of highly leveraged farm businesses (those with a debt-to-asset ratio greater than 0.40) has declined since 1992, as has the share of the value of production contributed by highly leveraged farms.

The broad types of debt used by farm businesses were relatively stable from 1992 to 2011—total debt was comprised of about 60 percent real estate debt, 20 percent non-real-estate debt, and 20 percent short-term debt throughout the entire period.

Although stable overall, U.S. farm debt use varied widely by farm size, specialization, operator age, and other farm characteristics.

Key factors that influenced debt use include:

- ***Farm business size and organization***. Large-scale family farms (those with annual gross cash farm income of $1 million or more) hold the largest share of farm business debt (about 35 percent). The share of debt held by these farms has increased since 1992, while the share held

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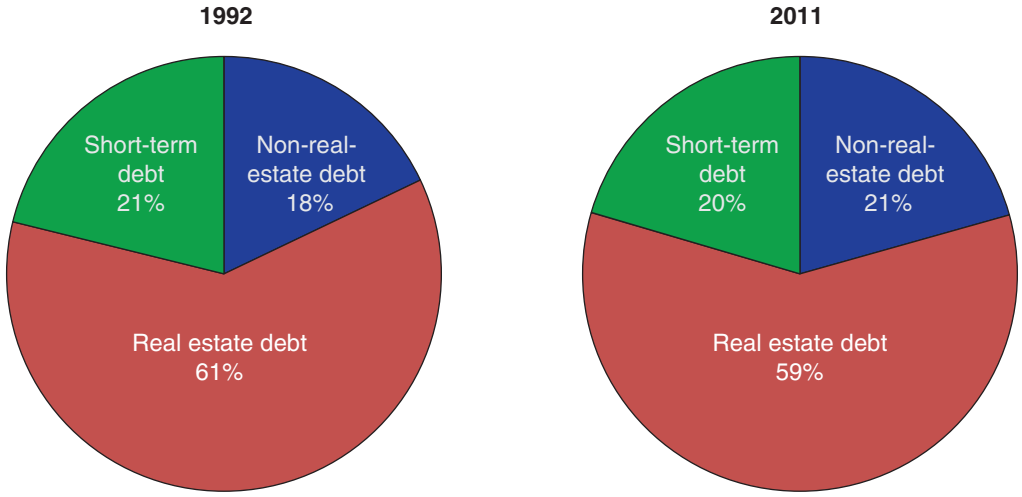
U.S. farm business debt share by type of debt, 1992 versus 2011



Source: USDA, Economic Research Service and National Agricultural Statistics Service; 1992 Farm Costs and Returns Survey and 2011 Agricultural Resource Management Survey.

by small-scale family farms with a farming occupation (farms whose principal operator has farming as his or her primary occupation and annual gross cash income less than $350,000) has declined.

- ***Commodity specialization***. Farm businesses specializing in dairy and poultry production have the highest average debt-to-asset ratios (0.19 and 0.18 in 2011, respectively) while field crop, specialty crop, and beef farm businesses have the lowest debt-to-asset ratios (0.10, 0.10, and 0.06 in 2011, respectively).
- ***Region***. Debt-use levels vary by region, but these differences are not as substantial as between the other categories considered in this study. In 2011, farm businesses in the Northern Crescent had the largest average debt-to-asset ratio (0.12), and farm businesses in the Basin and Range had the smallest (0.07). These patterns largely reflect regional differences in the types of farm commodities produced.
- ***Operator's age***. Farm business debt-to-asset ratios decrease as operator age increases. While most age groups experienced an overall decline in debt-to-asset ratios over 1992-2011, the youngest group (age 34 or younger) did not experience a substantial decline in financial leverage. Farmland purchases and ownership may play an important role in these trends.

How Was the Study Conducted?

This study was conducted using data from the Farm Costs and Returns Survey (1992-95) and the Agricultural Resource Management Survey (1996-2011), which were both conducted jointly by the U.S. Department of Agriculture's Economic Research Service (ERS) and National Agricultural Statistics Service. The study considered only farm businesses—family farms with annual gross cash farm income of $350,000 or more, smaller family farms whose principal operator reports farming as his or her major occupation, and nonfamily farms—which held about 79 percent of all farm debt and made up 42 percent of all U.S. farms in 2011. Farm businesses were separated into four subcategories (small family farms that had farming as their major occupation, midsize family farms, large-scale family farms, and nonfamily farms) based on the ERS farm typology. Gross cash farm income was adjusted for inflation when classifying farm businesses, and the key variables considered were debt uses, total debt, and debt-to-asset ratios.

Debt Use By U.S. Farm Businesses, 1992-2011

Introduction

The use of debt by farm operators can signal both financial strength and the willingness or need to take on financial risk. If the return on debt-financed assets exceeds the cost of debt, debt use will increase farm income and wealth. However, increasing use of debt also increases the financial risk that a farm faces (including the risk of bankruptcy) if farm revenues are lower than expected. Farm operators have different risk preferences, or inclinations to take on a certain level of risk, and a farm's debt level is a business decision made between the operator and the financial institution or other source of borrowed capital. However, decisions regarding use of debt at the farm level can have implications for the entire farm sector and for the rural businesses that serve this sector. For example, a wave of farm bankruptcies in the early 1980s, caused by declining farm income and a rapid increase in interest rates, led many agricultural lenders to belatedly adopt stricter lending standards (including basing loan decisions on farm income instead of collateral). During this period, many farm businesses were forced to liquidate assets as working capital dried up, while many rural banks failed and the economic sectors that supported agriculture declined (Barnett, 2000).

Given its broader economic implications, policymakers and bank regulators are concerned with farm debt use. Today's near-record levels of farm income have led to comparisons between the past decade and the decade leading up to the farm crisis in the 1980s, and concerns about similarities in debt use. While average farm income and debt use increased during both periods, there are also many differences. The structure and organization of the farm sector, agricultural lending practices, and the overall macroeconomic environment have all changed substantially over the past 30 years. Hence, concerns about debt use are best considered in the context of current farm financial conditions.

The U.S. farm sector has had several years of relatively high and increasing farm income since 2000. Since 2011, inflation-adjusted farm-sector income has been at near-record levels (USDA/ERS, 2013). These high-income levels, combined with increasing farmland values, have allowed farmers to increase overall debt while reducing their financial leverage (as measured by their level of debt relative to the value of their assets). Total debt held by farm businesses increased 39 percent from 1992 to 2011 in inflation-adjusted terms. Likewise, inflation-adjusted farmland values nearly doubled from 1992 to 2011, due to increasing farm income, decreasing interest rates, and various other factors (Nickerson et al., 2012). Increasing production and machinery expenses also put upward pressure on debt use.

Historically low interest rates over the past 5 years have lowered the cost of debt financing and made it a more attractive option for farmers. Lenders may also rate more farmers as qualified borrowers due to low interest rates. Many forecasts predict a decline in farm income and an increase in interest rates (Schnitkey, 2013; Westcott and Trostle, 2013), and either prediction could make high levels of farm debt riskier for both lenders and borrowers, although agricultural lending practices are typically conservative relative to other sectors of the economy. For example, most farmland purchases require a down payment that is a larger share of total value than for housing purchases. However,

risks are not uniform across the U.S. farm sector. U.S. farms' use of debt is as diverse as the farm sector itself, with debt use varying widely by farm size, specialization, operator age, and other farm characteristics.

This study considers basic debt-use patterns from 1992 to 2011 by farm businesses, which are defined as small family farms whose operators designate farming as their main occupation, family farms with gross cash farm income (GCFI) over $350,000 (midsize and large scale), and nonfamily farms. Farm businesses have consistently held around 80 percent of total farm debt and made up less than half of all U.S. farms over the 20 years studied (see table 1). The average farm business debt-to-asset ratio was 0.13 in 1992, rose to 0.15 in 1997, and declined to 0.09 in 2011.

This report is a primer on the use of debt by farm businesses for policymakers, researchers, and others interested in the financial health of the U.S. farm sector. While this report will not provide statistical analysis of farm business debt use, it will provide suggestions for future research in this area.

Table 1
Farm business characteristics, 1992 versus 2011

	1992	2011
Number of farm businesses*	954,400	908,900
Share of all farms	46%	42%
Share of farm debt	77%	79%
Percent with no debt**	44%	57%
Debt-to-asset ratio	0.13	0.09

Note: *Rounded to the nearest 100, **no debt is defined as debt-to-asset ratio less than 0.01.

Source: USDA, Economic Research Service and National Agricultural Statistics Service; 1992 Farm Costs and Returns Survey and 2011 Agricultural Resource Management Survey.

Farm Business Definition

This report identifies two major types of farms—family farms and nonfamily farms—as farm businesses (based on the latest USDA, Economic Research Service farm typology (Hoppe and MacDonald, 2013)):

- Family farms are defined as farms with majority ownership by the principal operator's household and relatives in other households. Family farms are further subdivided into the following categories for this report:
  - Small farms are those with real gross cash farm income (GCFI) less than $350,000. Small farms whose operators claim farming as their primary occupation are classified as farming-occupation farms with either low sales or moderate sales (which were combined for this study). Small farms whose principal operator reports being retired from agriculture (retirement farms) or their primary occupation as something other than farming (off-farm occupation farms) are excluded from this study because they generally have less debt and rely on off-farm income.
  - Midsize family farms are those with GCFI between $350,000 and $999,999, and
  - Large-scale family farms have GCFI of $1 million or more. These farms are further divided into two categories, large and very large, based on GCFI (which were combined for this study).
- Nonfamily farms are all other farms, including partnerships of unrelated operators where none of the partners holds a majority of the farm or a farm owned by absentee heirs of the previous owner where the operator is a hired manager. As of 2011, 78 percent of nonfamily farms had GCFI less than $350,000.

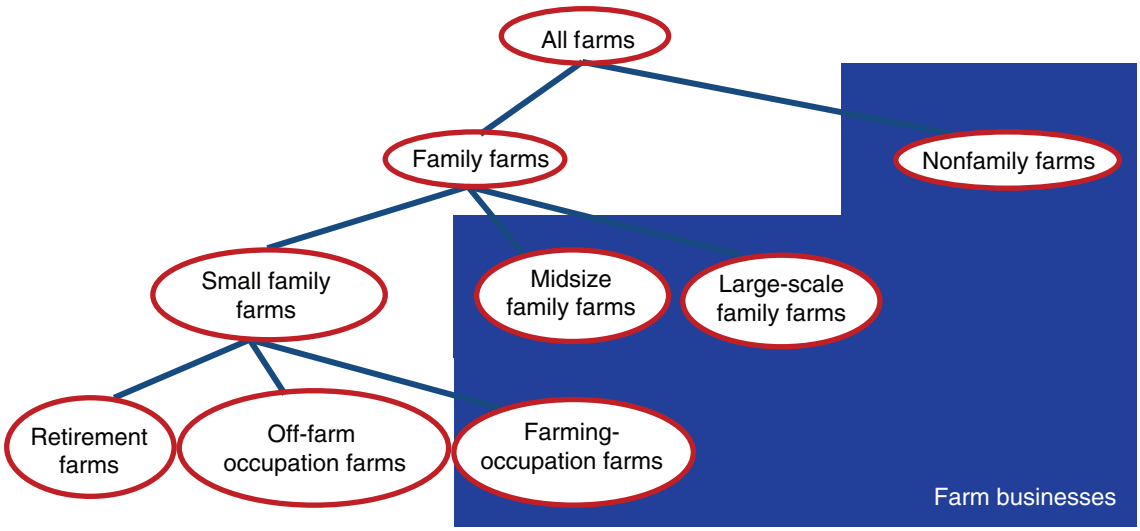
Table 2
Farm characteristics by classification, 2011

	Farm businesses	Retired/off-farm occupation	All farms
Number of farms*	908,900	1,263,900	2,172,800
Share of all farms	42%	58%	100%
Share of farm debt	79%	21%	100%
Percent with no debt**	57%	74%	67%
Debt-to-asset ratio	0.09	0.06	0.08
Avg. debt per farm***	$153,200	$29,200	$81,100

Note: *Rounded to the nearest 100, **no debt is defined as debt-to-asset ratio less than 0.01, ***average debt for all farms in each category.

Source: USDA, Economic Research Service and National Agricultural Statistics Service; 2011 Agricultural Resource Management Survey.

Farm business classification



Source: USDA, Economic Research Service.

Data Sources

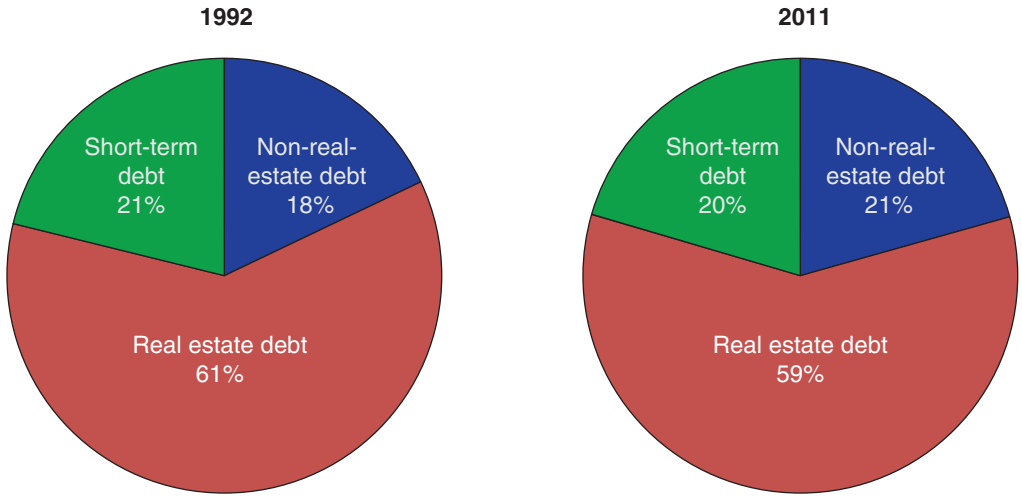
This study uses data from the 1996-2011 Agricultural Resource Management Survey (ARMS) and the 1992-1995 Farm Costs and Returns Survey (FCRS), a predecessor to the ARMS, which were both conducted jointly by the U.S. Department of Agriculture's Economic Research Service (ERS) and National Agricultural Statistics Service. Given the long timeframe of the study, it was necessary to adjust the selection criteria for farm businesses for inflation. For example, a farm that made $350,000 in 1992 would be much larger in terms of quantity of production than a farm that made $350,000 in 2011. When determining farm typology classifications in each year, we used the Producer Price Index (PPI) deflator to adjust GCFI to real 2011 dollars, following the recommendations of White and Hoppe (2012). After adjusting for inflation, GCFI of $350,000 in 2011 is equivalent to GCFI of $194,200 in 1992. The 1992 FCRS did not identify retired farmers, so respondents over the age of 70 were assumed to be retired that year.

Farm Debt Uses

The major types of debt used by farm businesses did not change substantially over the 20 years studied (fig. 1). The type of debt held (whether short-term debt, real estate debt, or longer term, non-real-estate debt) provides information on how debt is being used, as well as loan conditions and maturity. Short-term debt is classified as any debt—including production loans—lasting less than 1 year, while non-real-estate debt includes loans with a maturity greater than 1 year but not secured with a lien on real estate. (Debt for each category and throughout this report is measured as the balance owed on December 31—therefore, short-term debt does not include any short-term (or operating) loans taken out and repaid within the year.)

The majority of farm debt is either used to purchase real estate or is secured with a lien on farm real estate (while real estate loans could be used for machinery purchases or other production expenses, most are used to purchase real estate or refinance real estate debt). With some small fluctuations, the share of debt held by farm businesses between 1992 and 2011 has roughly been 60 percent real estate debt, 20 percent long-term non-real-estate debt, and 20 percent short-term debt.

Figure 1
U.S. farm business debt share by type of debt, 1992 versus 2011



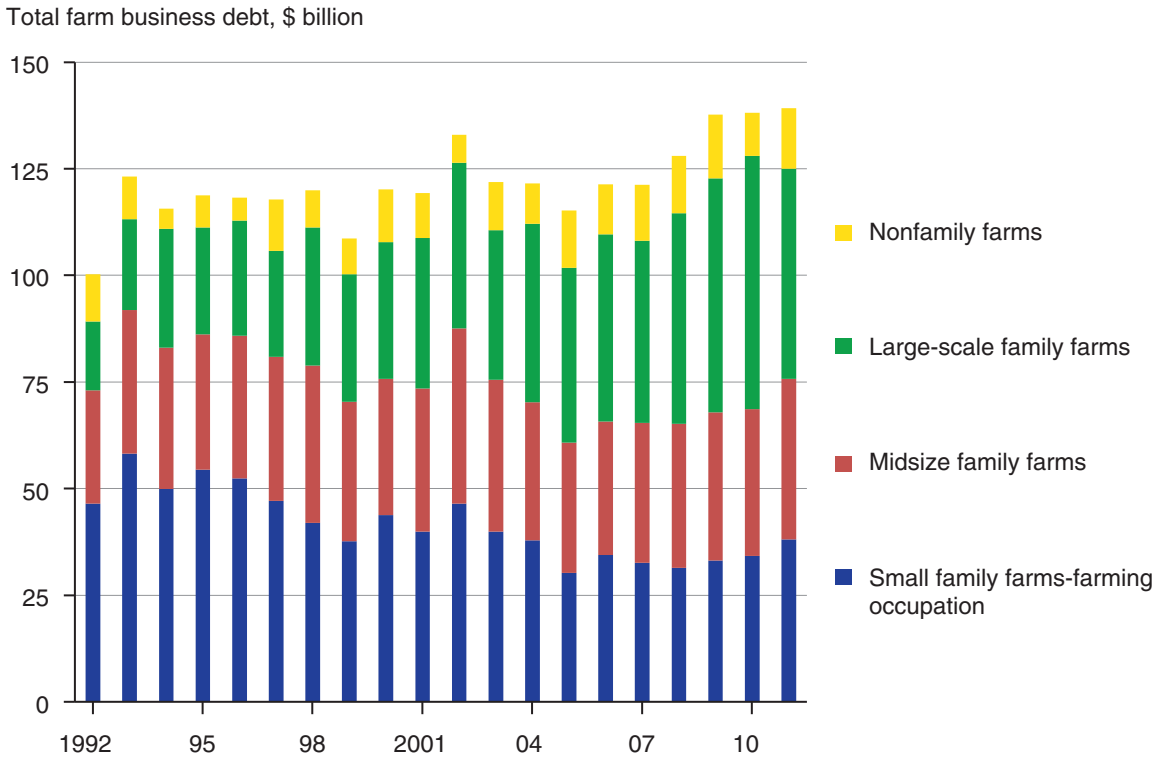
Source: USDA, Economic Research Service and National Agricultural Statistics Service; 1992 Farm Costs and Returns Survey and 2011 Agricultural Resource Management Survey.

Debt by Type of Farm Business

Farm size and organization are major factors influencing farm debt use. While total farm business debt increased from $100 billion in 1992 to $139 billion in 2011 (in constant 2011 dollars using the chain-type deflator (White and Hoppe, 2012)), the contribution of different farm business types to total farm business debt also changed (fig. 2). The share of farm business debt held by large-scale family farms increased from 16 percent in 1992 to 35 percent in 2011 (table 3). The share of debt held by small family farms with a farming occupation has declined from 46 percent of all farm business debt to 27 percent over the same period. The value of production created by farm businesses has shifted similarly. In 1992, small family farms contributed the greatest share of the value of production of farm businesses (35 percent), and large-scale family farms contributed only 24 percent. In 2011, large-scale family farms contributed 37 percent and small family farms 20 percent of the value of production. The share of debt held by midsize family farms and nonfamily farms, and the value of production created by these farm types, stayed relatively constant over the 20 years studied.

The average debt held per farm is another key indicator of debt-use trends. For large-scale family farms, average debt increased by about 70 percent from $684,400 in 1992 to $1,165,500 in 2011 (in constant 2011 dollars using the chain-type deflator (White and Hoppe, 2012)). Compared to 1992, there are now more large-scale family farms and they have more debt on average. In this respect,

Figure 2
Total U.S. farm business debt, by type of farm business



Source: USDA, Economic Research Service and National Agricultural Statistics Service; 1992-1995 Farm Costs and Returns Survey and 1996-2011 Agricultural Resource Management Survey.

Table 3
Share of farm business debt and value of production by type of farm business

Debt			Value of production	
1992	2011	Farm type	1992	2011
11%	10%	Nonfamily farms	18%	16%
16%	35%	Large-scale family farms (GCFI ≥ $1 million)	24%	37%
26%	27%	Midsize family farms (GCFI $350,000-999,999)	23%	27%
46%	27%	Small family farms-farming occupation (GCFI<$350,000)	35%	20%

Note: Percentages are based on debt and value of production for farm businesses only. GCFI refers to gross cash farm income.

Source: USDA, Economic Research Service and National Agricultural Statistics Service; 1992 Farm Costs and Returns Survey and 2011 Agricultural Resource Management Survey.

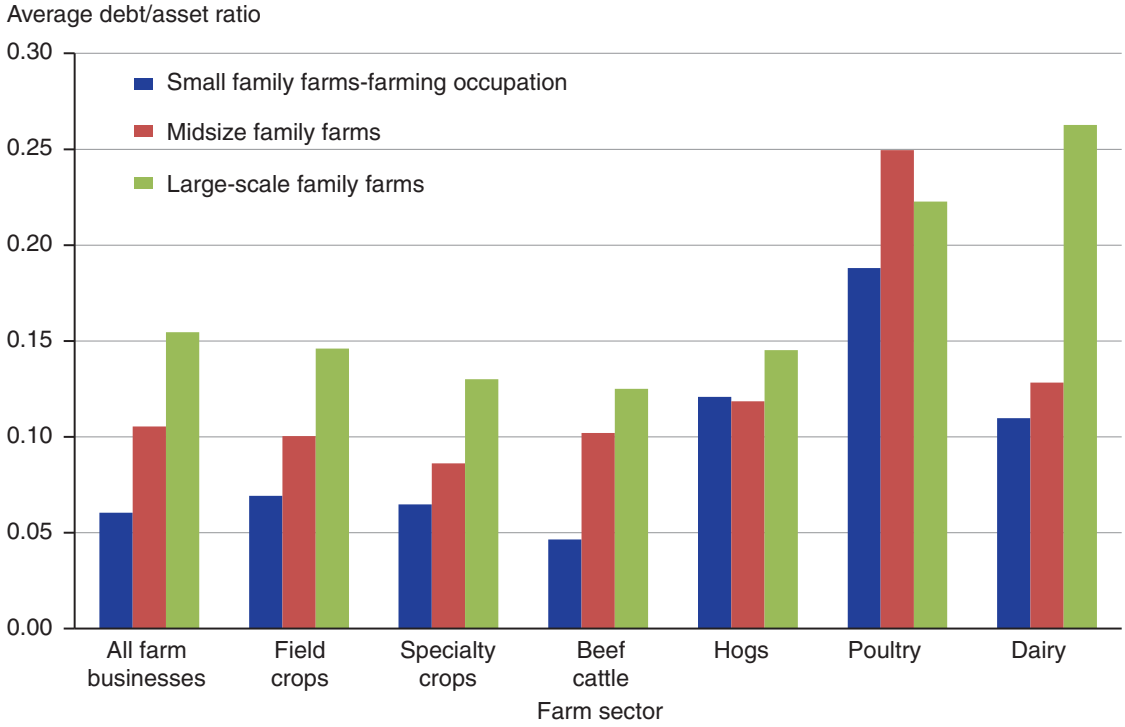
debt-use trends are related to broad structural changes happening in the farm sector. The average debt held by midsize family farms increased by about 16 percent from 1992 ($263,800) to 2011 ($305,900) after adjusting for inflation, while the average debt held by small family farms decreased by about 9 percent (from $61,300 to $55,600). Together, these trends indicate that most of the growth in farm business debt from 1992 to 2011 is attributable to large-scale family farms. Debt held by nonfamily farms increased by about 58 percent from $153,600 to $244,100 (on average).

Debt Use by Farm Business Commodity Specialization

Different farm commodity specializations have different financing requirements, so their debt use varies significantly. Debt-to-asset ratios are a key measure of a farm's leverage, or the degree to which farm assets are financed by debt. Higher debt-to-asset ratios indicate a higher reliance on borrowed funds and generally coincide with a higher likelihood of loan default. Although several measures are necessary to comprehensively evaluate the financial health of a farm operation, the debt-to-asset ratio is a widely used measure of financial risk. Debt-to-asset ratios tend to increase as farm size increases, and they also vary by farm specialization. While the debt- to-asset ratio that implies vulnerability to insolvency varies based on individual farm business characteristics, a commonly used threshold is a debt-to-asset ratio greater than 0.40 (for example, in Harris et al., 2009).

Dairy and poultry farm businesses are generally more leveraged than farms specializing in the production of other commodities (fig. 3). These specializations generally face higher capital costs, which contribute to increased debt use. Dairy farms were more leveraged in 2011 than in 1992, on average, because the dairy sector underwent significant structural change during this period and average farm size increased substantially (MacDonald et al., 2007). Capital expenditures necessary to increase farm size may have contributed to the higher average debt-to-asset ratio for large-scale family dairy farm businesses.

Figure 3
Average debt/asset ratio of U.S. farm businesses by specialization and size, 2011



Note: Farm business specializations are determined by the commodity or group of commodities constituting the majority of the farm's total value of production. Nonfamily farms are excluded due to concerns about statistical reliability.

Source: USDA, Economic Research Service and National Agricultural Statistics Service; 2011 Agricultural Resource Management Survey.

Large-scale family poultry farms have slightly lower leverage than midsize family poultry farms; however, this difference is not statistically significant. Further, the majority of poultry farm businesses fall into either the small or midsize family farm business categories. For example, around 70 percent of poultry farms with production contracts had only one to four poultry houses in 2006. Poultry houses are also likely to be debt financed (MacDonald, 2008), leading to small and midsize family poultry farm businesses having substantially higher leverage than similar farm business types with other specializations.

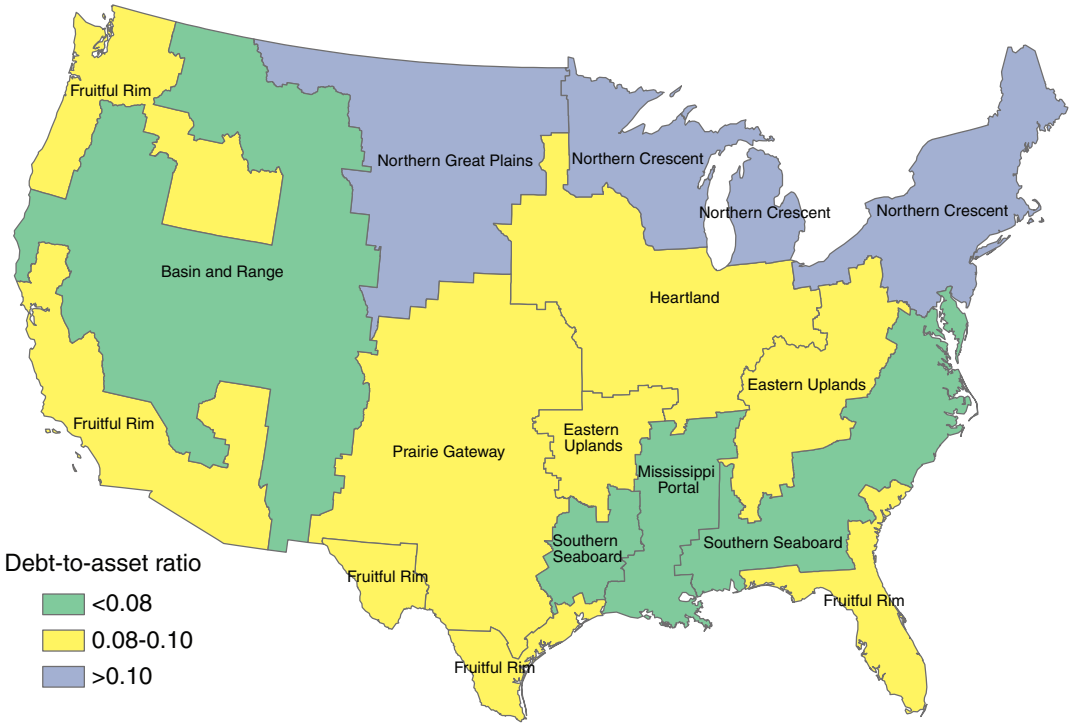
Field crop, beef, and hog farms, on the other hand, had relatively large reductions in leverage between 1992 and 2011. Crop farm businesses, in particular, have likely benefited the most from increasing farmland values, and this may be reflected in their relatively low debt-to-asset ratios. Beef and hog farm businesses had levels of leverage similar to field and specialty crop farm businesses in 2011, with the exception of small family farms that specialize in hog production. Large-scale family farms that specialize in hog production have substantially more cropland acres on average than similar poultry farm businesses (almost five times as many cropland acres operated in 2011) and lower financing costs than similar dairy farm businesses, which may explain why their debt-to-asset ratio is relatively lower. Beef cattle farm businesses have lower average capital investments than other livestock farms, which might contribute to their relatively low debt-to-asset ratio.

Farm Business Debt Use by Region

Average farm business debt-to-asset ratios vary by region (fig. 4), although the differences are not as striking as by specialization or by farm size. In 2011, farm businesses in the Northern Crescent had the largest average debt-to-asset ratio (0.12), and farm businesses in the Basin and Range had the smallest (0.07). The average debt-to-asset ratio has fallen for all regions since regional data collection started in 1996, with the largest reductions occurring in the Mississippi Portal and the Basin and Range regions.

Several factors can affect these regional differences, including farm size, specialization, lending institutions, and risk preferences/culture. Dairy farm businesses are more prominent in the Northern Crescent, while farm businesses are more likely to operate on a larger scale in the Northern Great Plains, contributing to higher average debt-to-asset ratios in these two regions. Farm businesses in the Southern Seaboard tend to be smaller than in most other regions, while farm businesses in the Basin and Range are more likely to specialize in beef or "other livestock" (mainly sheep and horse production) than businesses in other regions, contributing to lower regional debt-to-asset ratios.

Figure 4
Average U.S. farm business debt-to-asset ratios by region, 2011



Note: These are ERS U.S. Farm Resource Regions. For more information, see http://webarchives.cdlib.org/wayback.public/UERS_ag_1/20111128195215/http:/www.ers.usda.gov/Briefing/ARMS/resourceregions/resourceregions.htm

Source: USDA, Economic Research Service and National Agricultural Statistics Service; 2011 Agricultural Resource Management Survey.

Farm Business Debt by Operator Age

The average age of farm business operators rose over the 20 years studied (table 4). In 1992, 30 percent of all principal farm business operators (the operator primarily responsible for day-to-day management decisions) were younger than 45 years old, and 48 percent were older than 55. In 2011, 13 percent of principal farm business operators were younger than 45, and 68 percent were older than 55. The share of farm businesses with principal operators from age 45 to 54 was similar in 1992 and 2011.

It is best to consider a relative measure of debt, such as the debt-to-asset ratio, to understand the changes in farm debt use by operator age over time because the sheer increase in the number of operators 55 and older makes comparing absolute debt levels between the age groups over time less informative. As expected, farm business debt-to-asset ratios have largely been decreasing over the past two decades, and debt-to-asset ratios also tend to decline as farm business operators age (fig. 5). Young operators use debt to expand their farm operation, adopt new technologies, and improve competitiveness and profitability. Older operators are more likely to have paid off farm debts and are less likely to take on new debt as they approach retirement. Therefore, operator age is a key factor in farm business debt-use trends.

Younger operators (34 or younger) had similar leverage in 2011 as in 1992. However, operators in the 35-44 and 45-54 age categories experienced an overall reduction in leverage, although there is considerable year-to-year variation in average debt-to-asset ratios for these age groups. Upticks in leverage for these age groups in the last 5 years may have been due to loans taken out to purchase increasingly expensive farmland during this period. Production expenses also increased during this time and may be another contributing factor. Older operators (age 55-64 and 65 up) also experienced an overall decline in leverage since 1992. Additionally, while all age categories experienced significant fluctuations in leverage that largely correspond to farm income levels in a particular year (such as 2002), operators age 55 and older experienced significantly less variation in their average leverage in the later half of the study period. This may be due to these operators owning more farmland than other age categories and being less likely to take out new loans. Further, because older operators are less likely to expand their operations, higher farm income during the later half of the period may have allowed older operators to use less debt for production expenses. The role of real estate debt and farmland ownership in debt use by different operator age groups is an important topic for future research, as is the impact of an aging farm operator population on debt-use trends.

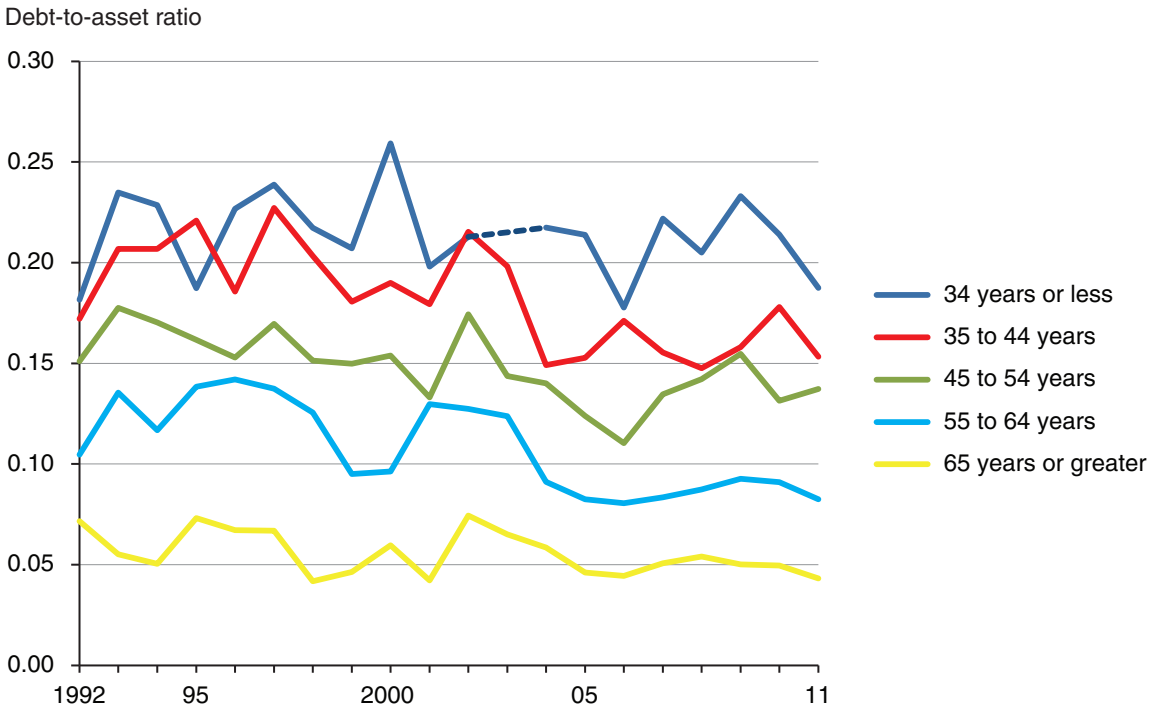
Table 4
Proportion of farm business principal operators by age group, 1992 versus 2011

	1992	2011
Less than 45 years old	30%	13%
45 to 54 years old	22%	19%
55 years old and older	48%	68%

Source: USDA, Economic Research Service and National Agricultural Statistics Service; 1992 Farm Costs and Returns Survey and 2011 Agricultural Resource Management Survey.

Figure 5

Farm business debt-to-asset ratios by principal operator age, 1992-2011



Note: The dashed line indicates that the debt-to-asset ratio for operators 34 years or younger was imputed for 2004 due to concerns about statistical reliability.

Source: USDA, Economic Research Service and National Agricultural Statistics Service; 1992-1995 Farm Costs and Returns Survey and 1996-2011 Agricultural Resource Management Survey.

Highly Leveraged Farm Businesses Over Time

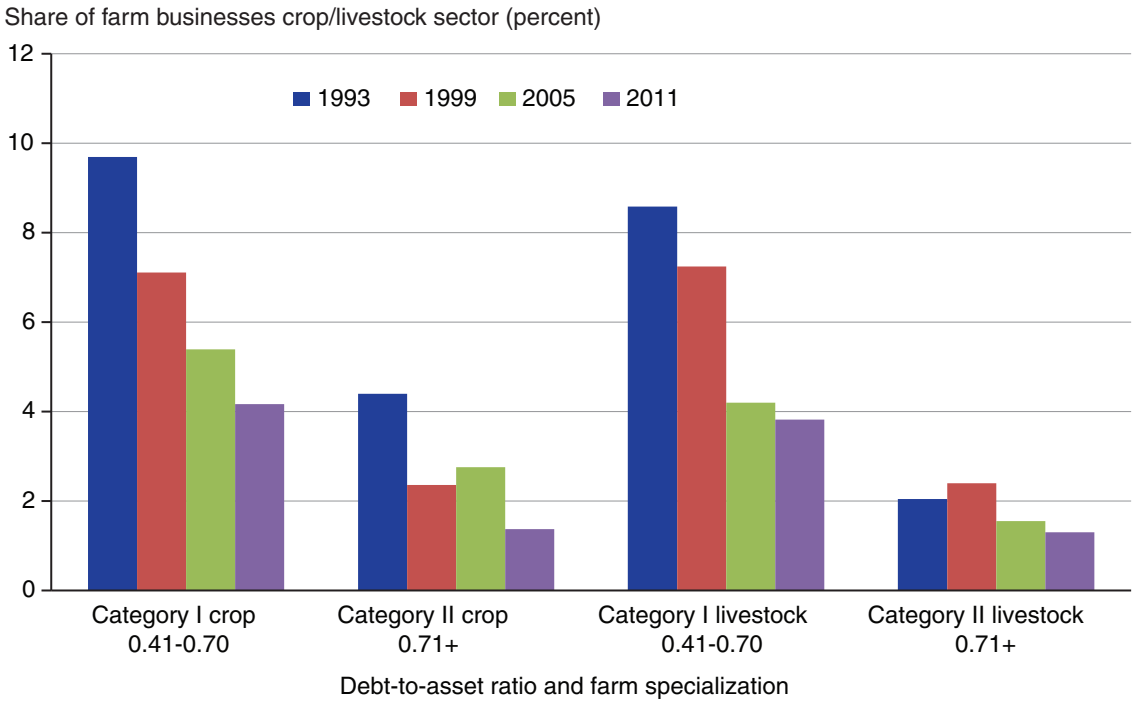
The share of farm businesses with high debt-to-asset ratios has declined over time. In addition to average debt-to-asset ratios, a more robust picture of farm debt use emerges by considering changes in the number of highly leveraged farms (fig. 6). Specifically, we consider two categories of farm businesses based on the leverage categories used by Harris et al. (2009):

Category I: Farm businesses with debt-to-asset ratios between 0.41 and 0.70, and

Category II: Farm businesses with debt-to-asset ratios greater than 0.70.

Over time, the shares of crop and livestock farm businesses that were highly leveraged declined. Between 1993 and 2011, the share of farm businesses with debt-to-asset ratios exceeding 0.4 was halved (to less than 6 percent). In 1993, almost 10 percent of crop farms were in *Category I,* and more than 4 percent were in *Category II*. By 2011, the share of farm businesses falling into these two high-leverage categories had declined to 4 percent and 1 percent, respectively. Among livestock farm businesses, over 8 percent were in *Category I* and 2 percent were in *Category II* in 1993, declining to less than 4 percent and 1 percent, respectively, by 2011.

Figure 6
Shares of crop and livestock farm businesses with high leverage, 1993-2011



Note: These two farm business specializations, crop and livestock, are determined by the specialization which constitutes the majority of each farm's total value of production. *Category I* farm businesses have debt-to-asset ratios between 0.41 and 0.70, and *Category II* farm businesses have debt-to-asset ratios greater than 0.70.

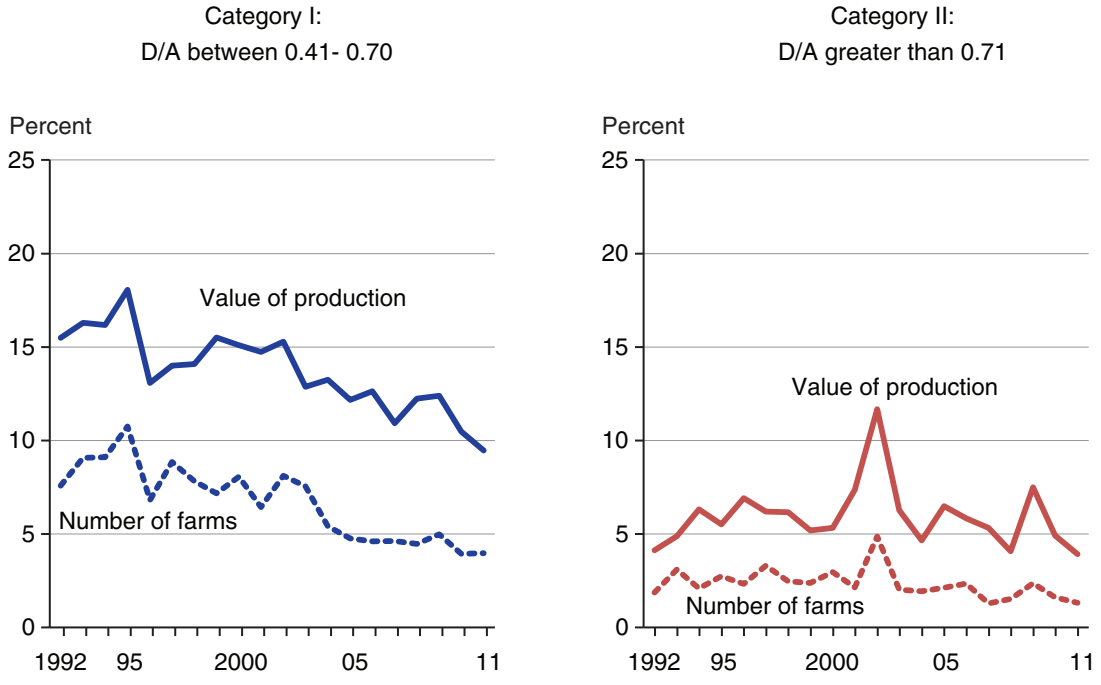
Source: USDA, Economic Research Service and National Agricultural Statistics Service; 1993 Farm Costs and Returns Survey and 1999, 2005, and 2011 Agricultural Resource Management Surveys.

Contributions to Value of Production by Highly Leveraged Farm Businesses

While the number of highly leveraged farm businesses has decreased over time, the contribution of these farms to the total value of production is also important, as it indicates the vulnerability of production to changes in debt levels. The declines in the share of the value of production attributed to highly leveraged farm businesses have largely been proportionate to the declines in the number of farm businesses with high leverage. Farm businesses in *Category I* (debt-to-asset ratio between 0.41 and 0.70) had an average value of production that was consistently twice the average for all farm businesses. In *Category I,* 8 percent of farm businesses contributed 16 percent of farm businesses' total value of production in 1992 (fig. 7). By 2011, 4 percent of *Category I* farm businesses contributed 9 percent of the total value of production.

The share of farm businesses in *Category II* (debt-to-asset ratio above 0.70) has declined slightly since 1992, and this group's share of the value of production has also declined slightly (although the overall downward trend is not as clear as with *Category I*). The value of production for farm businesses in *Category II* was between two and three times as large as the share of farm businesses in *Category II*: in 2011, 1.3 percent of farms were in *Category II*, and these farm businesses contributed 3.9 percent of the value of production. These shares may have spiked in 2002 and 2009 due to declines in farm income.

Figure 7
Share of farm businesses with high leverage and share of value of production, 1992-2011



Note: D/A stands for debt-to-asset ratio, with higher ratios corresponding to higher financial leverage and risk.

Source: USDA, Economic Research Service and National Agricultural Statistics Service; 1992-1995 Farm Costs and Returns Survey and 1996-2011 Agricultural Resource Management Survey.

Conclusion

This report highlights many of the factors influencing farm business debt use, such as farm size, commodity specialization, region, and operator age. Many of the differences in the use of debt by farm businesses are related to structural changes in the farm sector over the 20 years studied. Average leverage has declined across most of the farm categories considered in this study, and the share of farms that are highly leveraged, as well as their share of total farm business value of production, has declined over time. While older operators and crop farms are more likely to have benefited from increasing farmland values, livestock farms were also less leveraged in 2011, on average, than they were in 1992. Younger operators, large-scale family farms, and dairy and poultry farm businesses currently have the riskiest financial positions as measured by their average debt-to-asset ratios. However, if farm income declines or interest rates increase, most farm businesses appear to be better positioned to withstand the resulting loan payment shocks than they were in the early 1990s.

While this report provides a descriptive analysis of past farm business debt use, more research is needed to predict how current debt use would be affected by changes in financial conditions. Multiple changes could affect farm financial well-being, including a rise in interest rates, decline in farm real estate values, changes in farm and energy policy, and changes in international trade. The debt-carrying capacity of farm businesses that are more highly leveraged, such as those specializing in dairy and poultry production, may be more vulnerable to changes in these variables. Other areas of interest for future research include use of variable-rate loans, the impact of changes in interest rates, and the use of debt substitutes (such as production contracts or leasing farmland). A comprehensive financial ratio analysis for different farm types (which includes various measures of liquidity, profitability, and operating efficiency in addition to leverage) would also provide useful information on the financial health of farm businesses.

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