CHOICES
A publication of the Agricultural & Applied Economics Association
AAEA Agricultural & Applied Economics Association
1st Quarter 2016 • 31(1)

Farm Finance Theme Overview: Are the Good Times Really Over?

Damona Doye

JEL Classifications: Q10, Q14, Q18
Keywords: Farm Finance

In the Merle Haggard country song entitled "are the good times really over", he asks "are we rolling downhill like a snowball headed for Hell?" With farmland values continuing to decline in some areas (Kauffman and Clark, 2016; Oppedahl, 2016; USDA-NASS, 2015; Zhang, 2016) and net farm income projected to decrease again in 2016, expressions of concern about the agricultural sector's financial position and performance are mounting (Patrick, Kuhns, and Borchers, 2016). Deteriorating cash flow positions have contributed to slower loan repayment rates with increases in loan renewals and extensions, increased demand for non-real estate loans and some decline in the quality of the agricultural loan portfolio (Kauffman and Clark, 2016; Oppedahl, 2016). These changes follow several years of record profits, in which new borrowing was low and land values appreciated dramatically. During this period of prosperity, a new Farm Bill was negotiated focusing on risk management. The "Agriculture Act of 2014" ended direct payments, counter-cyclical payments and ACRE payments for all covered commodities, substituting a new revenue protection program, Average Risk Coverage (ARC), and a new price protection program, Price Loss Coverage (PLC). And, beginning in 2015, supplemental coverage options (SCO) for crop insurance on covered commodities enrolled in PLC (and cotton) and the Stacked Income Protection Plan (STAX) for cotton producers were added.

Records now show that net farm income peaked in 2013 (Patrick, Kuhns, and Borchers, 2016). As net farm income expectations adjusted, so did farmland values with rates of growth first braking, then declining in a number of states. Uncertainty abounds about how well the new farm bill provisions will protect farm income and wealth. Some measures of farm financial stress such as the debt-to-asset ratio remain low compared to the 1980s, but analysts question how well it illuminates the current situation. While comparisons of the current downturn to the 1980s farm crisis are inevitable, how different are things? And how much do they differ for different segments of the farm population? For instance, Zwilling, Krapf and Raab discuss changes since 2009 in the working capital of Illinois farms by operator age, highlighting the relatively lower levels of median working capital for younger operators.

The authors contributing to this theme provide timely insights on several dimensions of the agricultural economy. In "The Current State of U.S. Farm and Income Wealth", Patrick, Kuhns and Borchers provide a historical perspective along with the latest projections on net cash and farm income plus the sector's financial position. Also noted is the importance of non-operator landowners to the agricultural sector. The authors point out concerns about changes in the sector's balance sheet and solvency measures.

In "Structural Change Implies Unique Role for Federal Credit", Ahrendsen and Dodson highlight changes in farm structure in recent years, noting a further shift in production to larger farms accompanied by a growth in their share of debt plus incomes more variable than those of smaller producers. Lender consolidation is observed along with shifts in their portfolios and market segmentation. The role of Farm Service Agency lending programs and their use by agricultural producers and commercial providers of agricultural credit are discussed.

In "Leverage of U.S. Farmers: A Corporate Perspective", Ellinger, Featherstone, and Boehlje look at distributions of traditional leverage measures as well as alternative measures used by Moody's Credit Risk Methodology. A

national perspective of overall levels of cash flow and income relative to debt is provided along with distributional insights developed from state-level Farm Management Association data. Working capital position, estimated cushion and cash burn rates resulting from changes in margins at the farm level point out vulnerabilities of the agricultural sector.

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Recent Trends in U.S. Farm Income, Wealth, and Financial Health

Kevin Patrick, Ryan Kuhns, and Allison Borchers

JEL Classifications: Q12, Q14, Q15
Keywords: Farm Income, Farm Sector Balance Sheet, Farm Sector Finance, Financial Indicators, Agricultural Land Ownership

Current State of U.S. Farm Income and Wealth

Over a five-year period beginning in 2009, the U.S. farm sector's income grew rapidly. However, after years of strong farm sector performance, the U.S. Department of Agriculture (USDA) estimates net farm income declined in 2014 and projects continued declines in 2015 and 2016, returning to levels last observed in 2002, after adjusting for inflation. The continued drop in farm sector income is expected to place downward pressure on farm asset values, which had appreciated during the previous several years. The resulting drop in liquidity from multiple years of lower income is also expected to increase the need for sector borrowing relative to the 2009-2013 period. As a result, the USDA predicts a decline in sector equity and an increase in leverage, which signals the potential building of financial stress within the farm sector. A portion of U.S. farm businesses are highly leveraged and are at increased risk of default. While measures of financial health are worsening relative to the profitable 2009-2013 period, they remain better than historic averages.

USDA's Farm Income and Finance Data

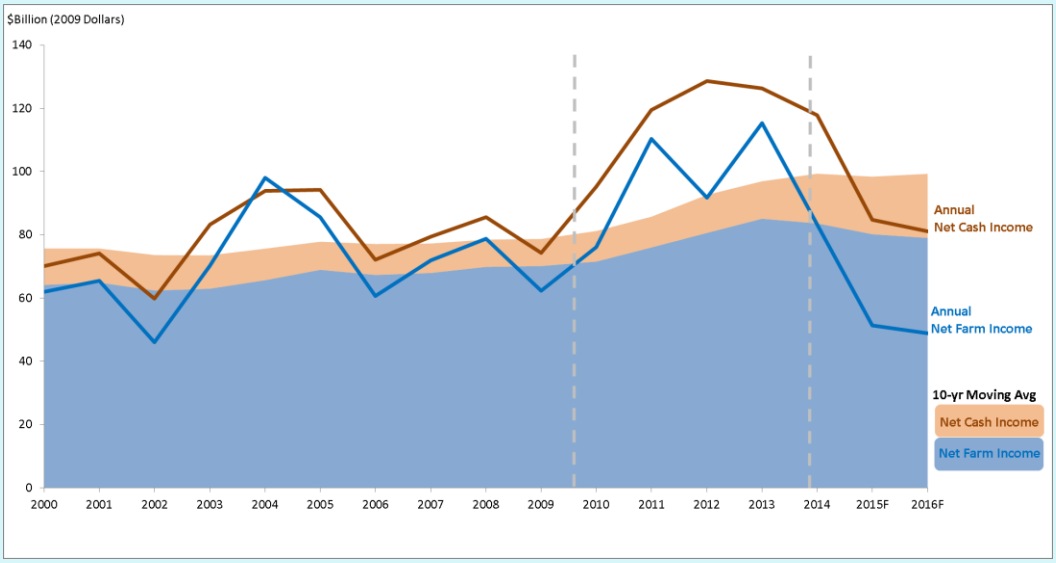
This article relies on USDA's Economic Research Service (ERS) Farm Income and Wealth Statistics data product. The data include historical state and national estimates of commodity revenues—called cash receipts in the data product—expenses, net income, assets, debt, and equity (wealth) as well as forecasts of economic performance for the U.S. farm sector. As of February 2016, the data product includes historic state and national level data through 2014 and national level forecasts for 2015 and 2016. The forecasts and estimates rely on the USDA's survey data, particularly Agricultural Resource Management Survey (ARMS) produced by ERS and National Agricultural Statistics Service (NASS), and also utilize administrative data, when publically available, such as loan and Commodity Credit Corporation (CCC) data. In addition to the data, ERS provides analyses of farm sector's income outlook and financial well-being. The data and analyses are used by USDA and industry leaders as a primary indicator of the financial health and economic well-being of the agricultural sector of the U.S. economy.

Farm Sector Income and Assets Values Surged from 2009 to 2013

Net cash income and net farm income are two high-level, but comprehensive measures of farm sector profits. Net cash income reflects all cash income and expenses for the sector in a given year. Net farm income is a more complete measure of economic profitability that includes noncash income such as the value of inventory change, as well as noncash costs such as capital consumption. During the 20 years prior to 2010, both income measures increased modestly.

Between 2009 and 2013, increasing commodity revenues combined with smaller expense increases led net cash and net farm income—and their 10-year moving averages—higher (Figure 1). Total commodity revenue grew by 38% over the 5-year period, driven largely by increases in commodity prices. The commodity revenue was helped by strong foreign demand for agricultural products, due in part to developing country growth and a relatively weak U.S. dollar combined with stable domestic demand bolstered by continued growth in the market for biofuels. Localized weather-related production disruptions also played a role in the increase in commodity revenue. The high prices that farmers received over this period outpaced the growth in production expenses. While input prices typically move in the same direction as commodity prices, they generally lag in adjustment. Zulauf (2014) finds it can take up to five years for the majority of the increase in crop prices to flow through to input prices.

Figure 1: Farm Sector Income Surged from 2009 to 2013 Followed by a Sharp Decline Since 2013



Footnotes: F=forecast. The GDP chain-type price index is used to convert current dollars to real amounts (2009=100).

The factors supporting the rise in income also contributed to a strong sector balance sheet during this period. Historically, more than seven out of every ten dollars of total farm assets are attributable to real estate—including land and buildings—therefore increases in farm real estate values drive the growth in the value of total assets on the farm balance sheet. Between 2009 and 2013, increases in farm real estate represented $699 billion—or 87%—of the $808 billion change in total sector assets. The increases in farm real estate values followed the rise in income over this period (figure 2). From 2009 to 2013, the value of farm real estate assets increased at a 9.7% annual percentage rate (APR). By comparison, these asset values grew at a 5.8% APR between 2000 and 2009.

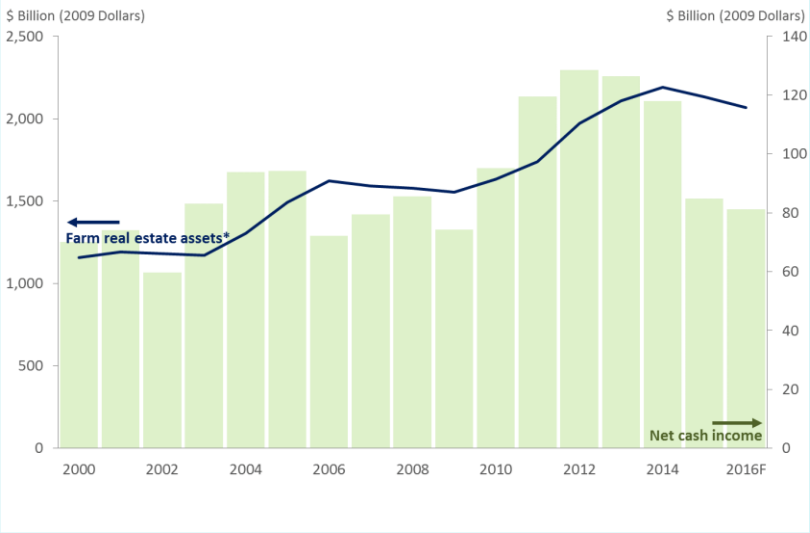
Between 2009 and 2013, the other side of the sector's balance sheet—debt—rose only 17% ($47 billion). Rapidly increasing asset values and smaller increases in debt caused sector equity to rise by $761 billion.

Net Income Expected to Continue to Decline into 2016

Following the farm sector's high income and rapid asset appreciation during the 2009-2013 period, net farm income and net cash farm income both fell modestly in 2014. USDA forecasts the decline to continue with a sharp decrease in 2015 and a third consecutive—though small—decline in 2016. Net farm income is expected to have declined 38% from 2014 to 2015, which would mark the largest year-over-year decrease since 1983. From 2014 to 2015, net cash farm income is projected to fall 27%, which would be the largest percentage decrease since the 1930's. Both net farm income and net cash farm income are forecast to decline marginally in 2016, down 2.5% and 3%, respectively. Even though both measures are forecast to be well below their 10-year moving averages, and

have declined sharply since 2013, the declines must be taken in context. In 2013 inflation-adjusted net farm income and net cash farm income were at or near their highest levels since 1973. Despite the large declines, the 2016 values for both income measures are in line with income levels prior to 2009, even after adjusting for inflation.

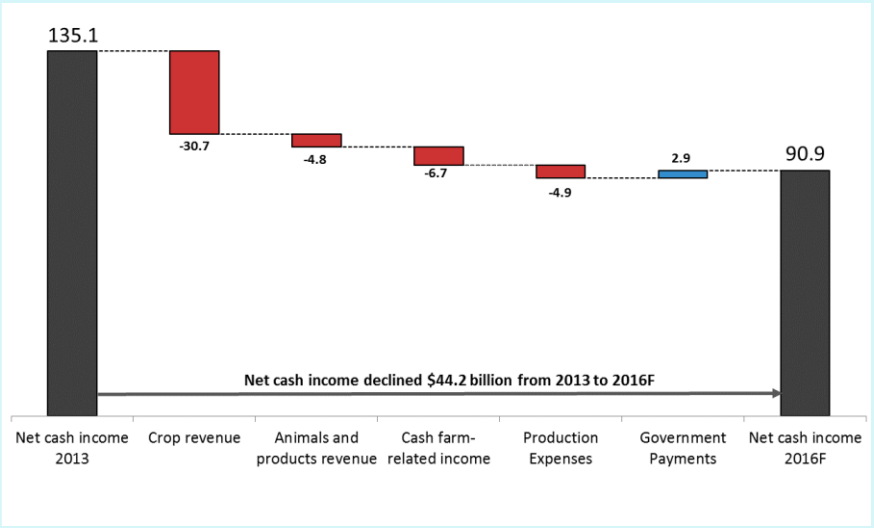
Figure 2: Rising Net Cash Income Led Farm Real Estate Value Increases



Footnotes: F=forecast. The GDP chain-type price index is used to convert current dollars to real amounts (2009=100).
Source: USDA-ERS, 2015b and USDA-NASS, 2015b.

The decline in farm sector income was primarily driven by a significant drop in commodity revenue (Figure 3). In particular, lower crop revenue accounts for 86% of the forecasted decline in total commodity revenue, and 70% of the total decline in net cash income between 2013 to 2016. The drop in crop revenue has largely resulted from a broad-based decline in crop prices, rather than falling production. In particular, multiple years of record or near record corn and soybean harvests led prices downward for these commodities, which historically have represented more than 25% of the farm sector's revenue. While small in comparison, animal and animal product revenues are also expected to decline by almost $5 billion between 2013 to 2016. Again, lower prices are the primary cause of the predicted decline.

Figure 3: Net Cash Farm Income Declined Sharply Since 2013



Footnote: All figures are in Billions ($).
Source: USDA-ERS, 2015b.

In addition to the drop in revenue, expenses are expected to remain above 2013 levels. Total sector expenses increased almost 6% in 2014 and although they are forecast to fall by 3% and 1% in 2015 and 2016, respectively, they are still near their historic highs. As was the case when income was on the upswing from 2009-2013, input costs are expected to move in the same direction as commodity prices in 2015 and 2016, but adjustments in input costs lag changes in commodity prices, and are not expected to be of the same magnitude as the changes in commodity prices. Therefore, expected

declines in sector expenses are not projected to fully compensate for falling revenues by 2016 and results in a decline in farm income.

Falling farm income is projected to impact the sector's balance sheet in multiple ways. Year-end farm real estate values are expected to decline modestly in 2015 and 2016 following the trend in farm income. Lower commodity prices negatively impact the value of farm inventory assets by reducing the per-unit value of stored crops, animals and animal products. Combined, total farm sector asset values are expected to decline for the first time since 2009, falling 2.8% in 2015 and 1.6% in 2016. Prior to 2015 farm sector assets had only declined two other times since 2000, with each of the previous declines also coinciding with downturns in farm income.

The farm sector's balance sheet also reflects a projected rise in farm debt use, in part due to reduced cash income. Even though it can eventually become more difficult to aquire debt if low levels of income are sustained for extended periods of time, lender data suggest the pace of nonreal estate borrowing—particularly operating loans—has increased markedly since 2013 (Kauffman, Cowley, and Clark, 2016). The impact of the expected decrease in farm assets in 2015 and 2016 and the increase in farm debt use since 2013, has negatively impacted the farm sector's balance sheet relative to the 2009-2013 time period.

Profitability and Financial Leverage Point to Weakening Position

The increase in farm income and asset values over the 2009-2013 period was also reflected in improved measures of sector profitability such as the return on assets (ROA) ratio. The ROA is a measure of the income produced by the sector's assets. Higher ROA values indicate the sector's assets are generating more income signaling increased profitability. Not surprisingly, ROA increased from 2009 to 2013 (Figure 4a).

Figure 4a: **Changes in Profitability Drive Rate of Return on Assets (Return on Assets**

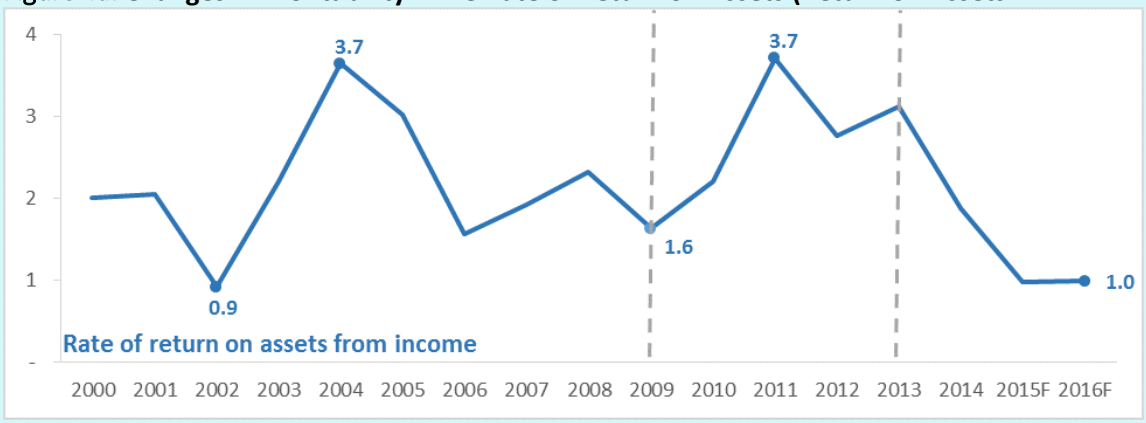
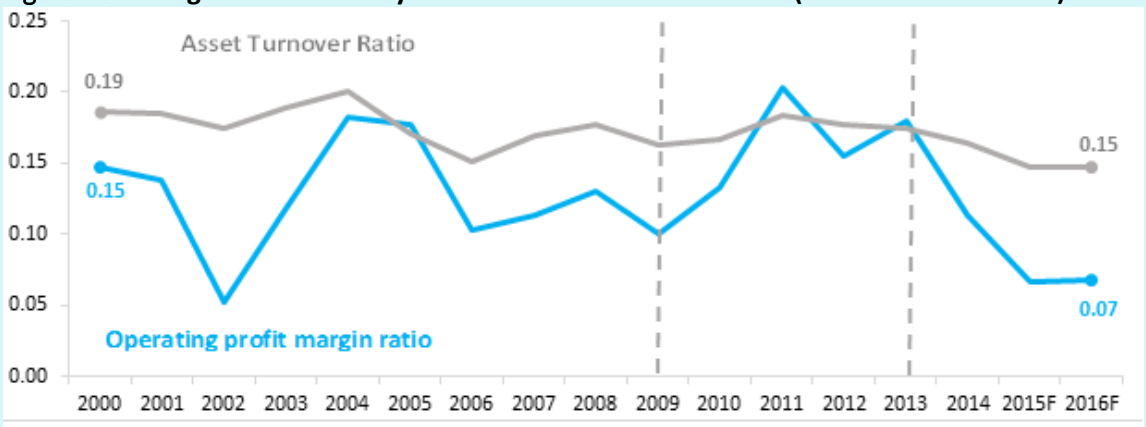


Figure 4b: **Changes in Profitability Drive Rate of Return on Assets (Asset Turnover Ratio)**



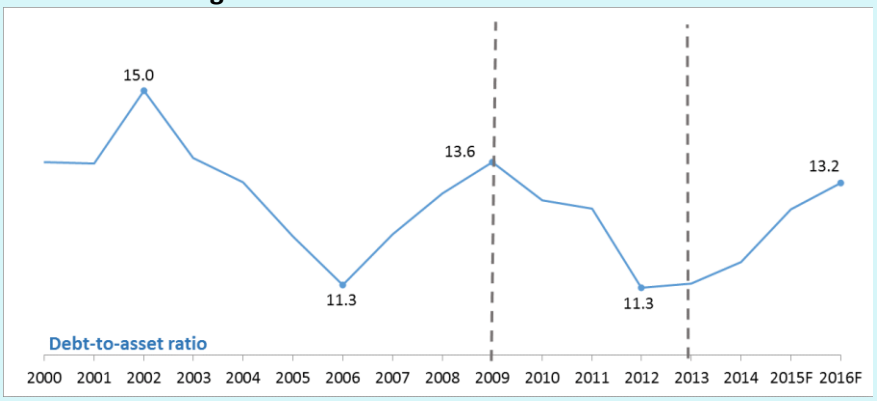
Source: USDA-ERS, 2015b.

To get a better idea of what was driving profitability increases over this time period, it is possible to decompose ROA into how efficiently farm assets were used to generate output and the sector's profit margin on that output (Figure 4b,). The asset turnover ratio measures the value of farm assets used to generate a dollar's worth of output, and the operating profit margin ratio measures the income per dollar of output. From 2009-2013, the sector's asset turnover ratio was relatively flat, at $0.18 of production per dollar of assets throughout the period. In contrast, the operating profit margin ratio rose sharply, increasing 80% to $0.17 of cash income per dollar of output. This suggests the primary factor driving the sector's surging income and asset values was the rapid increases in profit margin seen during this time period. This further reinforces that changes in input prices tend to lag swings in commodity prices.

The farm sector's ROA is expected to fall from a high of over 3% during 2009-2013 back down to 1% in 2015 and 2016. If realized this would represent the lowest sector ROA since 2002. The asset turnover ratio is expected to decline moderately relative to 2013. However, as was the case for the increase in ROA during the 2009-2013 period, changes in profitability drive the majority of the projected drop in ROA from 2013 to present. This again demonstrates what is seen in the farm income statement—the value of production has fallen significantly since 2013, while over the same period, farm sector expenses are forecast to have increased modestly. This squeeze on the top and bottom of the income statement drives down profitability, as illustrated by the expected 61% drop in operating profit margin ratio in 2016 compared to 2013.

In addition to the sector's profitability, the sector's solvency risk—the risk of default from being unable to pay long-term obligations as they come due—a measure of the farm sector's financial health. The debt-to-asset (D/A) ratio is one of the simplest measures of financial risk, conveying the portion of total farm assets that are financed by debt. Since a higher percentage of assets financed by debt results in less flexibility for the sector assets to cover potential financial liabilities, lower D/A ratios are generally preferable—lower percentage indicates less leverage and less risk. The farm sector's D/A ratio improved during the 2009-2013 period due in part to the positive effect of increased income on asset values relative to debt levels.

Figure 5: **Debt-to-asset Ratio Expected to Climb in 2016, but Remain Below 15 Year Highs**



Footnote: F= Forecast.
Source: USDA-ERS, 2015b.

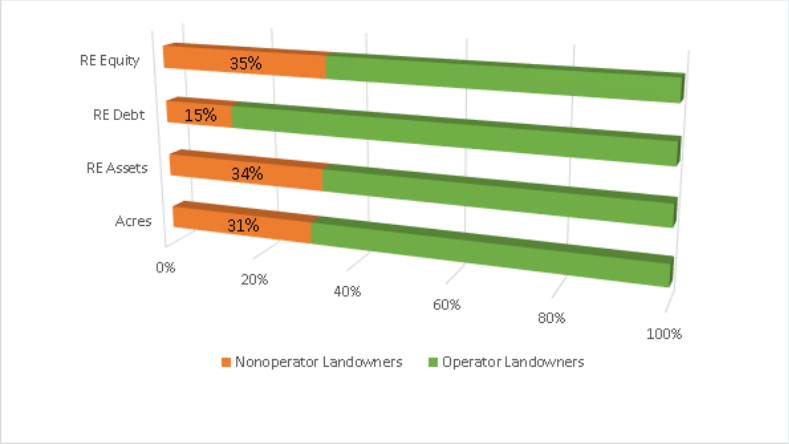
Since spiking at over 22 during the 1980s farm financial crisis, the sector's D/A ratio has trended lower, reaching a historical low in 2012. The D/A ratio has been increasing every year since 2012, and is forecast to continue increasing in 2015 and 2016 (Figure 5). The increasing D/A ratio—signaling an increase in financial leverage and therefore an increase in financial risk—reflects the impact of the large forecasted drop in farm income on the sector's balance sheet. While the farm sector's D/A ratio is expected to increase in 2015-2016, sector leverage remains low relative to historical trends. Only 13% of the value of farm sector assets are projected to be secured by debt in 2016, an amount substantially lower than the peak reached in the 1980s. Therefore, the sector as a whole appears relatively well insulated from risk associated with declining commodity prices, adverse weather, changing macroeconomic conditions, and others factors causing fluctuations in farm balance sheet values.

Share of Farm Businesses with High Leverage Trending Up

The sector-level trends reflect the economic performance of the farm economy as a whole. However, changes in sector-level income and total sector real estate asset values accrue to farm operators as well as other agricultural stakeholders, including nonoperator landowners. According to a new USDA survey—the 2014 Tenure, Ownership and Transition of Agricultural Land (TOTAL) survey—39% of land in farms (in the 48 contiguous States) was rented or leased. A portion (8% of land in farms) of this rented land was rented from other farm operators. However, the majority (31% of land in farms) of rented land was rented from non-operators. Therefore, both farm operators and non-operators benefit from, or are vulnerable to, changes in farm income and asset values.

Non-operator landowners rented out 31% of all land in farms, which represented 34% of the sector's value of real estate assets according to the 2014 TOTAL survey (Figure 6). In contrast, non-operator landowners hold a disproportionately low portion of sector debt—only 15%. As a result, non-operator landowners account for 35% of farm real estate equity.

Figure 6: Distribution of Real Estate Equity Between Operator and Non-operator Landowners, 2014



Footnote: Excludes Alaska and Hawaii.
Source: USDA-ERS and USDA-NASS, 2015.

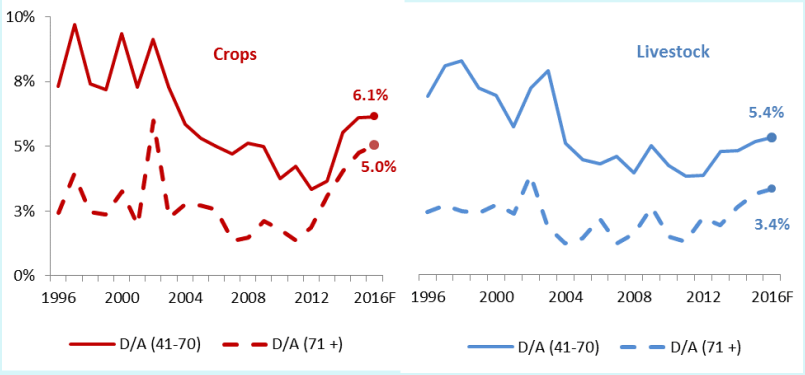
The farm sector's balance sheet nests the balance sheet of both operators and non-operator landlords. Because non-operators own a larger share of the sector's real estate assets than real estate debt, the farm sector's balance sheet may appear relatively stronger than if only the assets and debt owned by farm operations are examined. In addition, certain farms may use debt more aggressively than others, causing the sector balance sheet to mask heterogeneity among farms. Therefore, looking at the leverage for farm operations, and in particular farm businesses, may better illustrate the extent sector-level trends are reflected in the financial standing of individual farm operations.

Farm businesses— those farms with at least $350,000 in sales or farms with lower revenues where the operator's primary occupation is farming—account for more than 90% of the sector's production, and hold 71% of all farm assets and 80% of farm debt, according to the 2014 Agricultural Resource Management Survey (ARMS). Therefore, examining changes in the leverage position of farm businesses will provide a good gauge of how closely changes in the solvency risk for these operations compares to the total sector's solvency risk, which includes non-operator landlords in addition to farm operators. Because farm businesses represent such a substantial portion of the farm sector, the change in the average farm business D/A ratios shows a similar pattern to that seen in the sector as a whole. After reaching a near record low of 9.3 in 2011, the average farm business D/A ratio has been increasing and is expected to be higher, at 13, in 2016. However, farm businesses, like the sector, have relatively low leverage on average.

Because farm businesses vary in the intensity of their debt use, using averages can hide growing risks among lower performing farms. In 2016, over 11% of farm businesses specializing in crop production are expected to have a D/A over 40, and nearly half of these farms are expected to have a D/A greater than 70 meaning that over 70% of their assets are financed by debt, indicating the operations are highly leveraged (Figure 7). Similarly, almost 9% of farm businesses specializing in animals and animal products are expected to have a D/A over 40 in 2016, while just over 3% are expected to have a D/A greater than 70. The share of farm businesses with high leverage is currently trending upward, but is still below the levels that prevailed in the late 1990's when the data series began. However, in 2016 the share of crop farms with D/A ratios over 70 is expected to reach the second highest level

since 1996. Because lending institutions consider D/A, among other financial ratios, to assess credit worthiness of farms, some of these highly leveraged farm businesses may have difficulty securing a loan. Additional years of declining income and asset values could also put these farms at risk of default.

Figure 7: Share of Farm Businesses with High Leverage, 1996-2016F



Footnote: F= Forecast.
Source: USDA-ERS, 2015a.

Outlook for U.S. Farm Sector Income and Wealth

Over a prosperous five-year period beginning in 2009, the U.S. farm sector's income grew rapidly. From 2009 to 2013, increases in sector commodity revenues—due to increasing prices—outpaced sector expense increases, leading net income higher. Accordingly, the strength of the farm sector's financial position also improved, highlighted by improvements in traditional financial indicators, such as the ROA and D/A ratios. However, after several years of strong performance, net farm and net cash income fell in 2014, and USDA forecasts both to decline sharply in 2015 and continue with a modest decline in 2016. As with the increase seen from 2009 to 2013, the decline in net income from 2014 to 2016 is driven by changes in sector commodity revenues, due largely to lower prices, outpacing changes in sector expenses. The income declines are expected to result in a modest reduction in farm sector assets, particularly real estate, and lead to an expansion in farm debt. While this means sector financial indicators are worsening relative to the 2009-2013 period, they remain at historically favorable levels. Nevertheless, the share of farms which are highly leveraged has increased since 2011, approaching 20-year highs. This is particularly the case for crop farm businesses which have seen a large reversal in commodity prices. Highly leveraged farm businesses are most vulnerable to additional financial stress in the near future if they experience negative shocks to their income or asset values. The extent to which these farm businesses and the sector as a whole show increasing signs of financial stress, will be shaped by any future declines in commodity prices, as well as how quickly and to what magnitude input prices respond to changing commodity prices. Therefore, the continued interaction between changes in agricultural commodity prices and the cost of inputs will have significant bearing on the financial well-being of U.S. farms in the years ahead.

For More Information

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The views expressed in the paper are those of the authors and do not necessarily reflect those of the U.S. Department of Agriculture.

CHOICES
A publication of the Agricultural & Applied Economics Association
AAEA Agricultural & Applied Economics Association
1st Quarter 2016 • 31(1)

Structural Change Implies Unique Role for Federal Credit

Charles B. Dodson and Bruce L. Ahrendsen

JEL Classifications: G21, Q10, Q14, Q18
Keywords: Banks, Farm Credit, Farm Finance, Structural Change, USDA

The ongoing consolidation within the farm and credit sectors have impacted the role of the U.S. Department of Agriculture (USDA) Farm Service Agency's (FSA) farm credit programs (USDA-FSA, 2016). These structural changes have contributed to the emergence of distinct market segments in agricultural lending, each with unique risk profiles. In the farm sector, at one end are small, non-commercial farms that are not—on average—profitable and whose operators rely on nonfarm income. At the other end are large commercial farms with complex business structures and multiple operators which depend on farm income for family living as well as debt servicing. Moreover, consolidation in the credit sector has resulted in fewer and larger institutions and may have increased the demand for FSA credit programs.

FSA Farm Loan Programs

FSA direct and guaranteed loan programs are delivered through distinctly different mechanisms. Direct loans are made and serviced by FSA county office staff. Although local offices may get direction from the State and National offices, decisions regarding a direct loan are made primarily by local staff. Guaranteed loans are originated and serviced by qualified commercial, cooperative, or nonprofit lenders. Applications for a loan guarantee are made by qualified lenders to a local FSA office. Under a loan guarantee, FSA guarantees repayment of up to 95% of the principal balance. All loan guarantees are loss sharing, which means FSA will reimburse the lender for losses incurred in the case the loan goes into default, including loss of loan principal, some accrued interest, and certain liquidation costs. For more information on FSA farm loan types, maximum loan amounts, terms, and purposes, see USDA-FSA, 2015 and 2016.

FSA farm loan programs have historically provided credit to family-operated farms experiencing temporary financial difficulties. While this has not changed, consolidation has made the concept of the family farm more nebulous. The traditional family farm operated by one full-time farmer and spouse is giving way to larger farms with complex business structures and multiple operators. What may have been considered a full-time family farm a few decades ago would now likely be considered a small, noncommercial operation. Among farms with under $350,000 in gross cash farm income in 2011, a majority of household income came from nonfarm sources and two-thirds did not consider farming as their primary occupation (Hoppe, 2014). As agricultural production becomes increasingly dominated by fewer and larger farms that are presumably more economically efficient, some may question whether there is a need for FSA credit programs. Further, the prevalence of small farms which rely on nonfarm income may lead to further questions about FSA's role as a credit source.

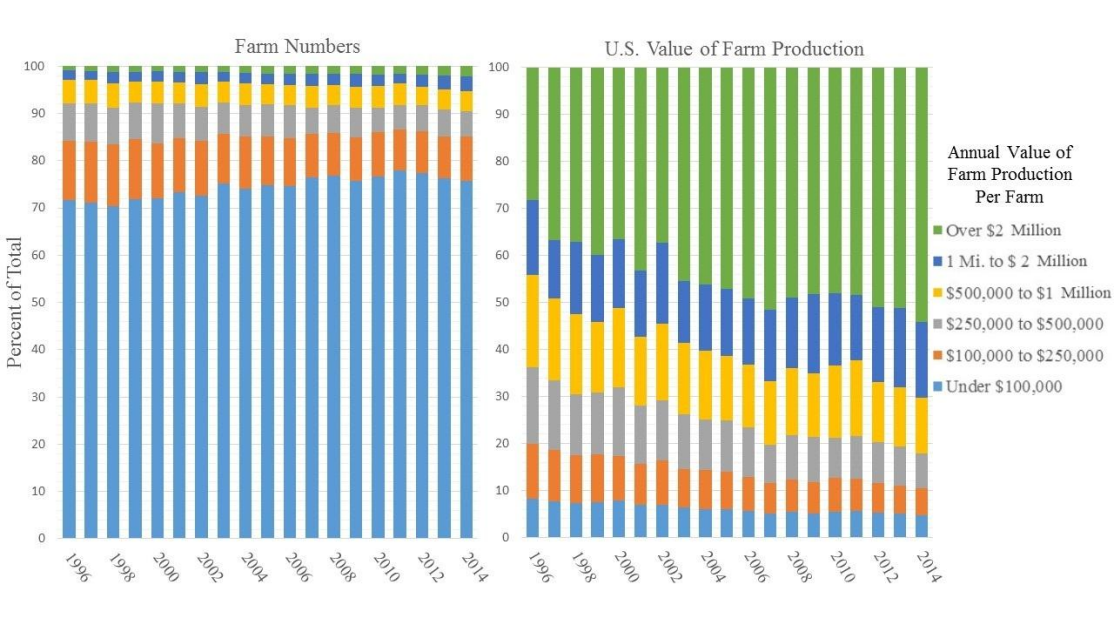
It may be, however, that farm consolidation actually results in a greater need for FSA credit programs. The broad policy role of all federal credit programs is to alleviate credit gaps resulting from market failures. Farm credit markets are generally considered susceptible to market failures, primarily as a result of imperfect competition or information asymmetries between the borrower and the lender (USDA, 2006). Information asymmetries occur because some lenders lack sufficient information with which to properly evaluate farm loan requests. Beginning farmers, for example, may have difficulty persuading lenders of their repayment ability because of their shorter track record.

Generally, the uniqueness of farming and its income variability and uncertainty is considered to make informational asymmetry more likely. Irrespective of the economies of size and scale gained through higher production, consolidation can increase market asymmetries as organizations become more complex and capital needs increase, resulting in a greater need for both FSA direct and guaranteed loans. And, while small farms may account for a small share of overall farm production, these farms have a large share of farm assets, represent a large share of the farm population, and are the primary channel through which beginning farmers enter farming. As such, a public policy role exists to alleviate credit gaps for small farms.

Farm Structural Change

Consolidation is a global economic phenomenon driven by economies of size and scale that has resulted in farms becoming larger and accounting for an increasing share of farm production. O'Donoghue et al. (2011) show that average operating profit margin is negative for U.S. farms with under $100,000 in sales, but turns positive and continues to increase as farm sizes become larger. An increase in operating profit margin may come from efficiency gains, lower input costs, higher outputs prices, or some

Figure 1: Distribution of U.S. Farm Numbers and Value of Farm Production by Farm Size Group in 2014 Dollars, 1996-2014[a]



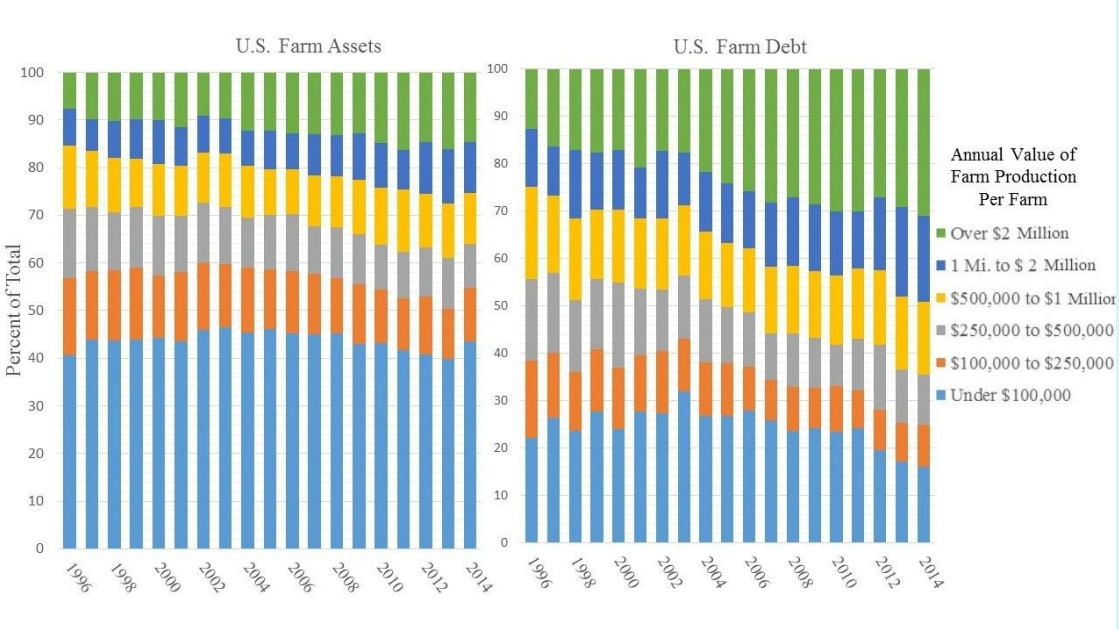
[a] Farm size groups are determined using value of farm production deflated by USDA-NASS price indices (2014 = 100).
Source: USDA-ARMS, 1996-2014.

combination. Additional economic advantages may be achieved through tighter alignments across production and distribution chains (Gray and Boehlje, 2005).

There has been a sizable shift in the value of U.S. farm production to larger farms even after commodity prices are adjusted to 2014 values (Figure 1). From 1996 to 2014, the share of farm production from farms with over $2 million in production has nearly doubled, from 28% to over 54%, and their share of total farm numbers has increased from 1% to 2%. While farms with $1 million to $2 million in farm production started and ended the period with a 16% share of total farm production, their share of farm numbers increased from 2% to 3%. The smaller farm groups experienced declines in shares of farm production and farm numbers with the exception of the smallest farms. Although small farms of under $100,000 in production also experienced a decline in their share of farm production, decreasing from 8% to 5%, their share of total farm numbers increased from 72% in 1996 to 76% in 2014.

Correspondingly, there has also been a shift in different farm sizes' shares of farm debt and assets. In 1996, 13% of farm debt was owed by farms with over $2 million in farm production, with the share increasing to 31% in 2014 (Figure 2). Although not as large of an increase, the share of assets controlled by these large farms increased from 8% to 15%. There also have been increases in the shares of farm debt and assets associated with farms having $1 million to $2 million in production. For farms with under $1 million in production, the shares of total debt and assets declined for all size categories over the past two decades, with the exception of the share of assets held by small farms. Farms with under $100,000 in farm production experienced a small increase in their share of assets, from 41% in 1996 to 43% in 2014.

Figure 2: Distribution of U.S. Farm Assets and Farm Debt by Farm Size Group in 2014 Dollars, 1996-2014[a]



[a] Farm size groups are determined using value of farm production deflated by USDA NASS price indices (2014 = 100).
Source: USDA-ARMS, 1996-2014.

While farms with less than $100,000 in production contributed only 5% to overall farm production, at 76% they represented a majority of the farm numbers and controlled the large share of farm assets at 43% in 2014. Based on the USDA's Agricultural Resource Management Survey (ARMS) data, three-fourths or more of small farm debt has been real estate debt and average farm income to these small farm households has been negative for the past 19 years. The predominance of real estate financing with repayment tied to nonfarm income makes financing this group similar to the residential mortgage market. With a reliance on nonfarm income, their risk profile is more likely to be influenced by regional factors such as unemployment and average wages.

While real estate debt as the dominant type of debt used by small farms has not changed over the past 19 years, the demand for debt by operators of small farms has declined. In fact, for all farm groups under $1 million in farm production, the shares of farms using debt has fallen (USDA-ARMS, (2016). For example, the share of farms under $1 million in farm production using debt fell from 34% in 1996 to 22% in 2014. A possible explanation is that their low or negative returns, combined with greater capital investment—often funded from nonfarm income or wealth—limits the use of debt. And, for those small farms that do not possess sufficient nonfarm income or wealth, lenders are likely to be reluctant to provide credit to operations at the margin. Even though most small farm operators neither consider farming to be their primary occupation nor do they rely on farm income, they may still be eligible for FSA credit programs. As long as an applicant supplies most of the farm labor, a part-time operator can be eligible for FSA credit provided all other loan eligibility criteria are met. The requirement that an FSA farm loan borrower be unable to obtain credit elsewhere, despite an ability to show repayment and provide adequate security, suggests the presence of credit gaps.

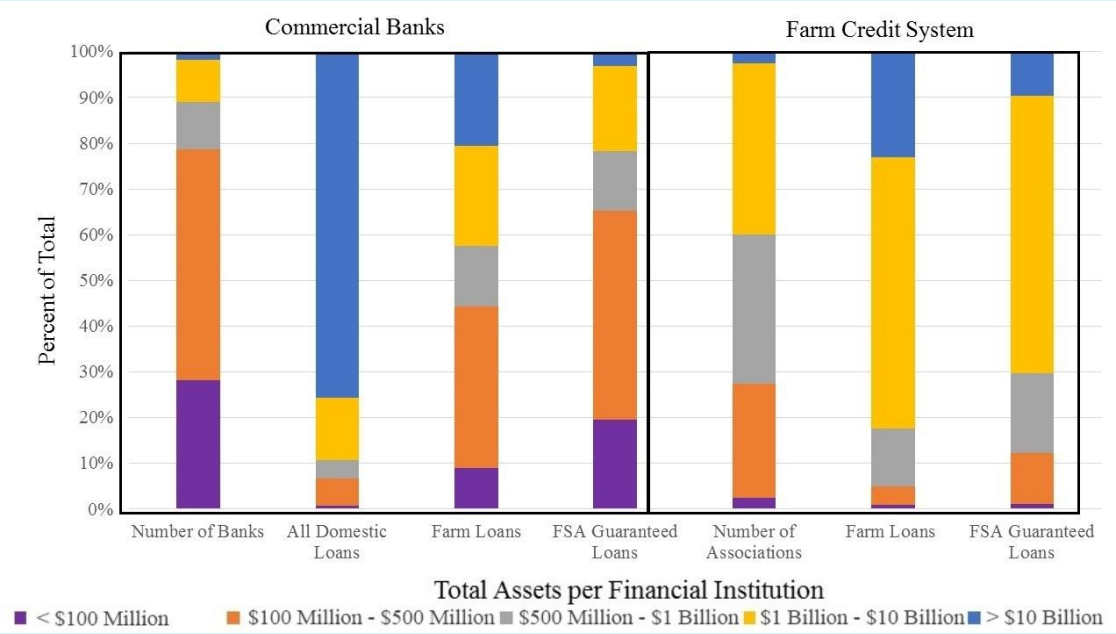
As a result of farm consolidation, more farm debt is now held by complex organizations with greater variability in household income and greater reliance on production contracts. Over the past 19 years, more than half of all farms with over $2 million in production have been organized as a partnership, corporation, or trust. Unlike smaller farms, farms with over $500,000 in production received more than half of household income from the farm (USDA-ARMS, 2016). This reliance on farm income implies household income is more variable for larger farms because farm income tends to be more variable than nonfarm wages and salaries.

While larger farms are more profitable, they may also be more subjected to economy-wide systematic risk. For example, farms with over $2 million in production are more reliant on production contracts than smaller farms. These contracts may provide an above-market price in return for delivery of products that satisfy quality standards set by the contractor. But, these farms could also be more vulnerable to general economic downturns, which could cause the contractor to either cancel or renegotiate the production contract—as sometimes occurs with broilers. Also, it may be possible that larger farms may increase systematic risk if their failure adversely affects other firms. For example, the fortunes of a large farm may be intertwined with other firms, such that the failure of one large farm adversely affects others in the production or distribution chain.

Lender Consolidation

Consolidation has been especially apparent in the banking industry, where a handful of large banks now dominate. Nearly 90% of all domestic bank lending now occurs through banks with over $1 billion in assets (Figure 3). The Nation's Farm Credit System (FCS) has also been undergoing consolidation, with 83% of all farm lending delivered by institutions with over $1 billion in assets in 2015. FSA loan guarantees are typically a small share of large financial institution lending. This is true for both banks and FCS. Banks of over $10 billion represented 21% of the banking sector's agricultural loan portfolio but only 3% of FSA guarantees of bank debt. Likewise, FCS institutions of over $10 billion represented nearly a fourth of all FCS farm lending, but only 10% of FSA guarantees of FCS debt.

Figure 3: Commercial Bank and Farm Credit System Distribution of Number of Institutions, Farm Loans, and FSA Guaranteed Loans, by Institution Size



Sources: Federal Financial Institutions Examination Council, Reports of Condition and Income (Call Reports), Farm Credit Administration Call Reports, and FSA Guaranteed Loan System, September 30, 2015.

Even though the financial services sector has become increasingly consolidated, smaller institutions still supply a large share of agricultural credit and rely more heavily on FSA guarantees to do so. At 42% of the U.S. farm debt market in 2014 (USDA-ERS, 2016), commercial banks represent the largest lender to agriculture; much of this is done by small community banks with less than $500 million in assets. And at 40%, the FCS also has a significant share of the farm debt market. While FCS has greatly consolidated, a sizable amount of its lending is still undertaken by smaller institutions. Banks and FCS institutions with less than $1 billion in assets provided over 40% of the credit supplied by banks and the FCS.

Small community banks, in particular, are the most dependent on FSA guarantees. In 2015, 65% of FSA guarantees of commercial bank loans were through institutions with less than $500 million in assets (Figure 3). This reliance on guarantees reflects the challenges faced by smaller community banks in handling risk associated with the large credit needs of today's commercial farms. Relative to large banks, the potential losses from larger loans are more likely to adversely affect a small bank's capital position. As was hypothesized for farm consolidation, lender consolidation may also increase demand for FSA credit programs. As banks consolidate, a greater share of farm lending may be undertaken by smaller community banks. Correspondingly, as farms consolidate and loan size increases, these smaller community banks may have to rely more heavily on FSA guarantees to manage their risk.

Impacts of Farm Consolidation on FSA Credit Programs and Policy

Policy responses to consolidation have mostly focused on loan limits and the targeting of loan funds to specific groups. Over the past 25 years, the average indebtedness of both direct and guaranteed borrowers has increased. Since 1996, guaranteed loan limits have been indexed to the NASS price index and in 2016 the limit was $1.4 million in total guarantee indebtedness. Loan limits for direct programs

are set by statute at $300,000 each for Farm Ownership (FO) and Operating (OL) loan programs and were last increased with the 2008 Farm Bill. But these loan limits, even for the guaranteed program, restrict the ability to meet the credit demands of some large farms. Since federal fiscal year 2000, about 3% of all guaranteed borrowers were at the loan limits for new loans according to FSA data. Despite annual increases in the loan limits for the guaranteed program, the share has remained between 3% and 4%. Over the same period, 5.6% of borrowers receiving direct FO or OL loans were at the maximum. While a small percentage of borrowers were affected by loan limits, these loans represented 9.3% of all new guaranteed loan obligations and 10.8% of direct FO and OL loan obligations.

Since some farms are at the maximum FSA loan limits and use a disproportionate share of the credit available, joint financing of commercial and FSA loans may be used to meet credit needs and further extend the use of FSA credit. If there is sufficient collateral to securitize the loan, FSA can subordinate their lien position when joint financing is used, resulting in FSA having a greater exposure to losses than the commercial lender.

Capital requirements can be onerous for beginning and socially-disadvantaged farmers, who are likely to be small and capital constrained. Accordingly, the share of loans targeted to specific groups has increased, especially for FSA direct programs, where over 80% of borrowers belonged to a targeted group in 2015. As commercial lenders focused on lending to larger commercial farms, many smaller farms have found it more difficult to obtain financing. This is because loan sizes requested by small farms may not be economical for commercial lenders. Consequently, operations desiring smaller loan amounts may be forced to use credit cards or other similar high-cost debt instruments. In response to these issues, FSA introduced a direct OL microloan program in 2013 for these purposes.

As a consequence of consolidation and resulting policy responses, the market segments served through each program have become more distinct, with the FSA direct loan program serving more small farms while the guaranteed loan program tends to serve larger farms. From 1997 to 2014, the shares of both FSA direct loan borrowers and guaranteed loan borrowers from farms with $100,000 to $500,000 in production declined (Table 1). Among farms with a direct loan, lending shifted to farms with under $100,000 in production, which increased from 30% in 1997 to 40% in 2014. Among farms with an FSA guaranteed loan, lending shifted toward farms with over $500,000 in production, where the share of farms with a guaranteed loan increased from 31% in 1997 to 50% in 2014.

The segmentation of FSA direct and guaranteed borrowers reflects statutory and other phenomena. By statute, the FSA direct loan program is mostly targeted to beginning and socially-disadvantaged groups, who are more likely to operate small, non-commercial size farms. The FSA guaranteed loan program, which has larger loan limits, less targeting, and a greater creditworthiness threshold, is more likely to serve commercial-sized family farms.

Guaranteed loan borrowers are much more likely to have a direct loan than vice-versa. At the end of fiscal year 2015, only 9.5% of all FSA direct and guaranteed borrowers had both direct and guaranteed loans outstanding. Most of the overlap was among guaranteed loan borrowers, where one in four guaranteed loan borrowers also had a direct loan. In contrast, only 12.6% of direct loan borrowers also had a guaranteed loan. This suggests that direct loans actually serve a broader spectrum of farms than guaranteed loans, and that direct loans serve a group of farms less likely to receive commercial credit.

Even though the largest share of FSA direct lending went to farms with less than $100,000 in farm production in 2014, less than 5% of all indebted farms of this size had a direct loan (Table 1). The greatest share of indebted farms with an FSA direct loan had between $100,000 and $500,000 in production. In contrast, the greatest share of farms with an FSA guaranteed loan had $500,000 to $2

million in production. In 2014, over 10% of indebted farms with $100,000 to $2 million in production had either a direct or guaranteed loan. While most farms with an FSA direct or guaranteed loan had less than $250,000 in production, larger farms are more dependent on FSA programs for their credit needs.

Table 1: Distribution and Percentage of Indebted Farms with a Direct or Guaranteed FSA Loan by Farm Size Group

Farm Loan Program	Farm Size[a]						
	Under $100,000	$100,000 to $250,000	$250,000 to $500,000	$500,000 to $1 Million	$1 Million to $2 Million	Over $2 Million	All Farms
	Distribution of Indebted Farms with an FSA Loan						
Direct							
1997	29.7	31.3	22.7	10.6	3.8	1.9	100.0
2004	26.9	26.4	23.9	12.7	7.1	3.1	100.0
2014	39.7	20.6	18.0	11.7	7.0	2.9	100.0
Guaranteed							
1997	12.5	26.1	30.8	20.0	7.5	3.1	100.0
2004	15.1	12.1	22.8	25.0	17.3	7.8	100.0
2014	16.9	12.3	20.6	23.7	16.9	9.7	100.0
Direct or Guaranteed							
1997	26.0	30.0	24.3	13.0	4.7	2.1	100.0
2004	23.5	21.6	22.5	17.1	10.4	5.0	100.0
2014	32.5	18.1	17.4	15.9	10.5	5.6	100.0
	Percent of Indebted Farms with an FSA Loan						
Direct							
1997	3.4	11.4	11.4	8.2	7.8	6.7	6.4
2004	2.4	8.2	10.3	7.3	7.8	5.3	5.0
2014	4.7	9.1	10.9	7.6	5.9	3.3	6.3
Guaranteed							
1997	0.6	3.9	6.3	6.3	6.2	4.4	2.6
2004	0.8	2.3	6.1	8.9	11.7	8.1	3.1
2014	1.4	3.8	8.8	10.8	10.1	7.7	4.4
Direct or Guaranteed							
1997	3.8	14.1	15.8	13.0	12.3	9.3	8.3
2004	3.1	9.9	14.4	14.5	16.9	12.2	7.4
2014	5.8	11.9	15.7	15.3	13.3	9.4	9.3

Source: FSA Farm Loan Program data merged with USDA Agricultural Resource Management Survey data.
[a] Farm size groups are determined using value of farm production deflated by USDA NASS price indices (2014 = 100).

Due to their income variability and tight profit margins, farms in these size groups may be especially vulnerable to credit constraints.

Possible Future Impacts on FSA Lending

While farm consolidation implies greater economic efficiency, it does not necessarily imply a reduced demand for FSA credit. Farms with under $100,000 in production have been increasing in number, and FSA's presence among those farms has been growing. While these farms contribute little to total U.S. farm production and are not generally profitable, they represent the largest population of U.S. farms and control a substantial share of farm assets.

Larger farms, especially those of over $250,000 in annual production, tend to be much more reliant on both direct and guaranteed FSA credit and are likely to become more dependent on FSA for several reasons. As farms continue to become larger, commercial lenders are likely to increase their demand for Federal guarantees, especially if smaller community banks continue to be a major provider of agricultural credit. With greater concern for managing the economy-wide systematic risk associated with serving larger farms, there may be a greater propensity to pursue guarantees, even among more creditworthy farms—especially given that expectations of lower farm incomes and softening land values will likely result in more farm businesses pursuing both direct and guaranteed loans.

Limited budgetary resources, however, may make it difficult to meet any increase in loan demand. Strong farm incomes and increasing asset values have resulted in limited losses in recent years, which in turn, have enabled FSA to deliver these loan programs at low cost to the government. The subsidy cost—which measures the government's budget cost—has fallen from 4.8% in 1996 to 0.8% in 2017 according to the Office of Management and Budget. Consequently, Congress has been able to fund FSA lending programs with less budget authority. With expectations of lower farm incomes, loan losses are likely to increase in upcoming years, which would increase subsidy costs. Also, farm loan staffing levels have been declining since 2010, placing additional constraints on FSA's ability to meet any increase in demand.

Without increased resources, policy makers and FSA may need to examine options for extending limited resources. Federal guaranteed loans are typically significantly less costly to deliver than loans made and serviced directly by a government agency (Gale, 1991). Hence, one possibility would be to transfer resources from direct to guaranteed lending. Given the distinct market segments served by each program, this could adversely affect beginning farmers and other groups served by the direct program.

Another alternative would be to focus lending resources on those groups that are most dependent on FSA credit. These groups include direct borrowers with annual production between $100,000 and $500,000 and guaranteed borrowers with annual production between $500,000 and $2 million. However, this implies reducing service to smaller farms who have historically been the focus of direct lending.

While FSA has made substantial use of loan participations with other lenders in recent years to leverage direct farm ownership loan funds, expansion of their use in other farm loan programs would enable FSA to further leverage its lending resources. Provided there is sufficient collateral to securitize a loan, FSA may subordinate to another lender who provides a portion of the loan funds. Since subordination would result in FSA being the first lender to absorb any losses, this strategy would increase risk exposure. In addition, greater streamlining of microloans could reduce loan delivery costs, but care would need to be taken to minimize any potential for increased losses.

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This work was supported, in part, by the USDA National Institute of Food and Agriculture, Hatch/Multistate project 1005079. However, any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view of the U.S. Department of Agriculture or the University of Arkansas.

CHOICES
A publication of the Agricultural & Applied Economics Association
AAEA Agricultural & Applied Economics Association
1st Quarter 2016

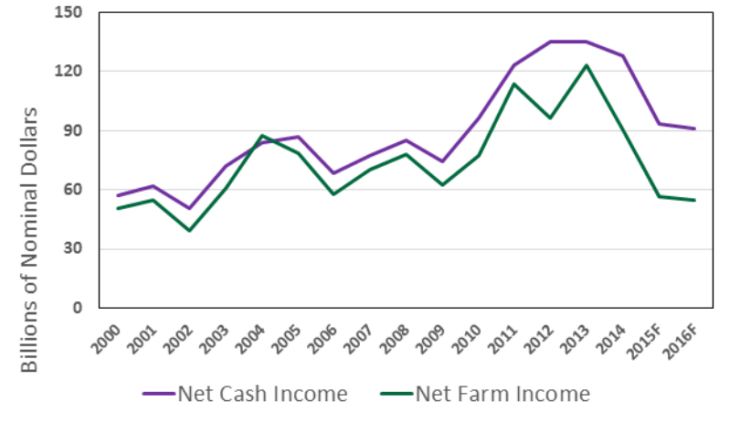
Leverage of U.S. Farmers: A Deeper Perspective

Paul Ellinger, Allen Featherstone, and Michael Boehlje

JEL Classifications: G21, Q10, Q14, Q18
Keywords: Farm Finance, Financial Stress, Leverage, Working Capital

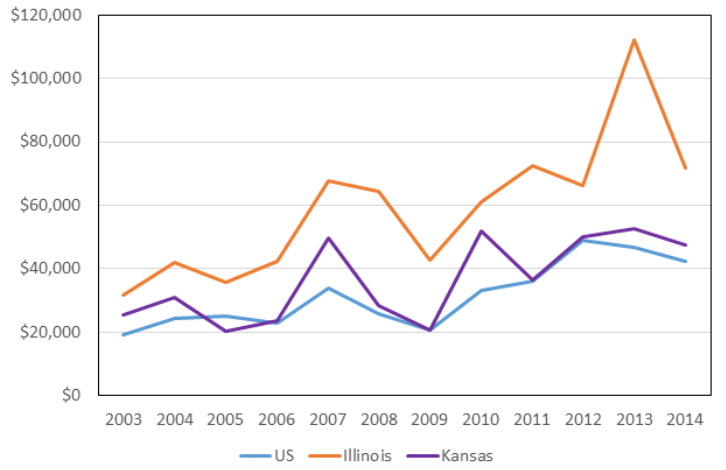
The pendulum of farm income has swung from record high levels at the beginning of the decade to an environment of extremely tight margins in 2016. U.S. Department of Agriculture (USDA) has forecasted nominal U.S. net farm and cash incomes to be the lowest levels in a decade. The net farm income levels are the lowest since 2002 (Figure 1). The declines reflect shrinking margins from declining crop prices and weaknesses in dairy and hog markets. The largest declines in net income are expected in the Corn Belt. According to the USDA Agricultural Resource Management Survey (ARMS) the average farm income for all farms in Kansas and Illinois more than doubled from 2005 to 2013 (Figure 2). However, net farm income levels in 2015 were negative for some individual producers. For example, in 2014 the average net farm income for the North Central Kansas Farm Management Association was $102,508 (KFMA, 2016). For 2015, the average net farm income for the same association was $11,452. It is also anticipated that average projected net farm income levels for 2016 are below levels to support family living and debt service for Kansas and Illinois producers.

Figure 1: United States Net Farm and Net Cash Income



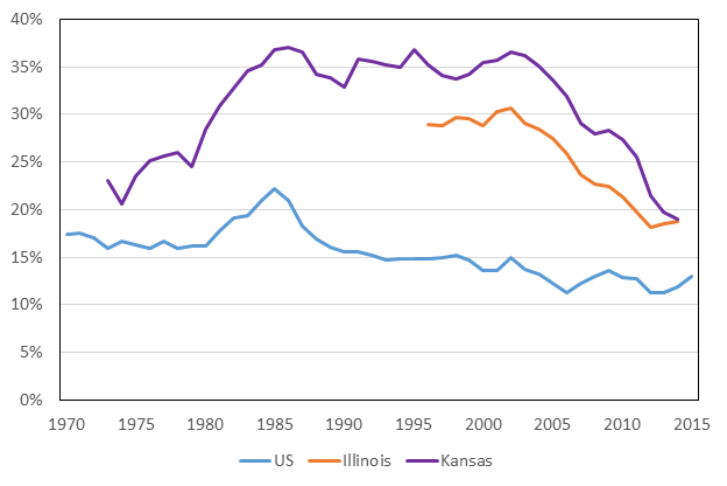
Source: USDA-ERS, 2016b

Figure 2: USDA-ARMS, All Farms, Illinois, and Kansas Net Farm Income, 2003-2014



Source: USDA-ERS, 2016a.

Figure 3: United States, Illinois, and Kansas Debt-to-Asset Ratios



Source: USDA-ERS, 2016a; FBFM, 2016; KFMA, 2016.

Economic downturns in agriculture increase the attention towards measuring financial stress in the sector and assessing the ability of producers to manage liquidity and debt. Production agriculture is characterized as using a low amount of debt relative to assets. The USDA forecasts a total farm debt of $373 billion in 2016, which is a 26% increase from 2011. Total assets in the farm sector are expected to exceed $2.82 trillion, resulting in a farm aggregate debt-to-asset ratio of 13.2%. Figure 3 reports the debt-to-asset ratio for the United States from 1970 to 2015 based on ARMS data, Illinois from 1996 to 2014 based on the Illinois Farm Business Farm Management Association (FBFM, 2016) data and Kansas from 1973 to 2014 based on the KFMA data. This commonly-used metric is often cited as a financial stress indicator and often interpreted as an indicator of the low leverage in the agricultural sector. Note the mean for farm businesses in Kansas and Illinois exceeded 30% in 2001 and 2002. Since then, it has generally declined to 19% in 2014; this is higher than the USDA all-farms industry average of 15% in 2002 and 13% in 2014.

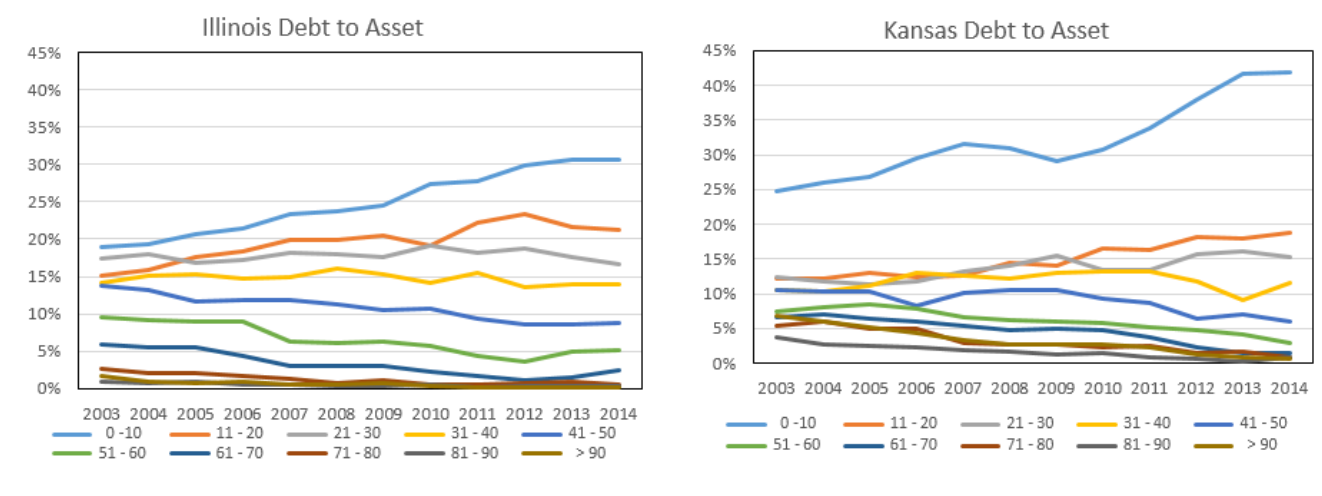
A primary weakness in using this aggregate measure of financial condition is the omission of any distributional characteristics among agricultural producers. Since a high percentage of producers have little or no debt, the aggregate measure provides little evidence of the proportion of farms with high levels of financial leverage and financial risk. Figure 4 indicates the distribution of debt-to-asset ratios for Illinois and Kansas farms.

In general, the proportion of Illinois and Kansas farms with higher debt-to-asset ratios has declined over this 12-year time period, an indication of improved financial resiliency. But with current declining values of farmland, machinery and equipment, and grain and livestock inventories in the 2014-2016 period, the financial vulnerability of those farms with higher debt-to-asset ratios has increased. The distribution of debt-to-asset ratios in 2014 indicates that less than 2% of Illinois and Kansas farmers are vulnerable to financial failure—defined here as debt-to-asset ratios of 80% or greater—with only a modest decline in asset values; the proportion classified as vulnerable operators increases to 5% at the 60% debt-to-asset threshold.

The debt-to-asset ratio measure reflects solvency, that is, the risk-bearing ability. From a lender's perspective it indicates the amount of secondary repayment capacity to service debt if assets are liquidated, or the financial reserves to support refinancing debt obligations if the borrower is unable to make debt servicing payments from cash flow or earnings. A common underwriting standard in agricultural lending is that the borrower should have at least as much at risk as the lender—that is, at least 50% equity in the business—to have adequate reserves to handle financial stress. The debt-to-asset distributions in Figure 4 indicate that 6.6% and 8.7% of the Kansas and Illinois farmers, respectively, would not meet this underwriting standard in 2014. With the decline in asset values and

increased debt since that time, an even higher proportion are likely to encounter difficult conversations with their lender along with financial vulnerability.

Figure 4: Distribution of Debt-to-Asset Ratios for Illinois and Kansas Farms, 2003 - 2014



Source: FBFM, 2016 and KFMA, 2016

The debt-to-asset measure of leverage is highly influenced by real estate values. Over 81% of assets in the agricultural sector are held in real estate that is valued on a market valuation basis. Farm real estate lacks liquidity and is characterized by low cash returns (Barry and Ellinger, 2012). Evidence from the residential real estate markets is that during a severe crisis, asset values experience larger than expected declines in market values. Although, there are no signs of a financial crisis in agriculture, changes in the debt-to-asset ratio will occur as land values adjust. Moreover, less than 10% of the assets held on farm balance sheets are highly liquid, meaning those other than real estate and machinery. Liquid assets and cash income are the primary sources of repayment for borrowers and are the drivers of the level of debt that can be serviced by agricultural producers. Hence, additional metrics beyond the debt-to-asset ratio could be used to enhance the assessment of financial stress in the agricultural sector.

Working Capital

Working capital—current assets less current liabilities—is the first buffer borrowers can utilize in periods of cash shortfalls. Many agricultural producers improved working capital during the past decade. Working capital increased from an average of $179 per acre during the decade 1996 to 2006 to over $700 per acre in 2012 on Illinois Grain farms (Schnitkey, 2015c). The increase in working capital improved the overall liquidity of operations, but the improvement was muted by the increase in cash costs of production on grain farms during this same period. Non-land costs increased from $300 per acre to $615 per acre for corn from 2006 to 2013 (Schnitkey, 2015a).

The three primary reasons to hold liquid assets are for transaction purposes, to meet unforeseen cash shortfalls and to have flexibility for investment opportunities (Barry and Ellinger, 2012). Higher levels of operating costs require higher levels of liquidity for both transactions purposes and a buffer for potential downfalls. Moreover, the price of farm investment opportunities increased over this same period as well. The average level of purchasing power working capital on Illinois farms could have purchased 50 acres of farmland in 2006. The average level of working capital increased to 85 acres in 2012 and subsequently declined to 57 acres in 2014. Hence, the cash reserve buffer from increases in

aggregate working capital is partially offset by the increased liquidity needed for transactions and investment opportunities.

A critical financial stress indicator for agriculture is the level of working capital relative to the working capital burn rate. Working capital burn is simply the projected net cash loss expected over the next year. The working capital expressed relative to the burn rate provides a measure of the number of years before working capital is exhausted. In Illinois, working capital change is projected at -$11 per acre for owned farmland, meaning that working capital would decrease $11 for each acre owned (Schnitkey, 2015b). On average, land that has been cash rented has a projected -$121 per acre working capital change or burn and share rented land has a -$72 change.

An Alternative Measure of Leverage

Since the debt-to-asset ratio may not be an effective indicator of the level of debt that can be serviced by a farm borrower or an adequate metric of financial stress in the agricultural sector, the debt-servicing to income ratio is an alternative metric. It is a commonly-used metric for determining the level of debt a household can service as well as a primary underwriting standard in the housing sector. The level of debt for commercial loans is also typically driven by the ability to generate cash. The most common measure of leverage is Net Debt—debt less cash and equivalents—divided by Earnings Before Interest Taxes, Depreciation and Amortization (EBITDA). EBITDA is a commonly-used proxy for cash flow being generated by a business prior to debt servic e and income taxes.

How is the Earnings Before Interest Taxes, Depreciation and Amortization Calculated?

Moody's Corporation, the parent corporation of Moody's Investor Services, provides credit ratings and research across alternative debt instruments including approximately 11,000 corporate issuers. Moody's Investor Services publishes their rating methodology for companies in different market sectors. The published methodology is useful in understanding the qualitative and quantitative factors used by Moody's in their credit rating process. Common rating factors used by Moody's for corporate businesses include scale, business profile, profitability, leverage, financial policy, market position and business risk. The four methodologies are:

1. Global commodity merchandising and processing companies
2. Global protein and agriculture industry
3. Global manufacturing
4. Global chemical industry.

Using farm-level data from the FBFM and the KFMA to evaluate distribution of farms by Debt to EBITDA, the Debt to EBITDA ratio is:

$$\text{Debt to EBITDA}_n = \frac{Total\ Liabilities_n}{\frac{EBITDA_n + EBITDA_{n-1}}{2}}$$

, where total liabilities exclude deferred taxes and contingent liabilities.

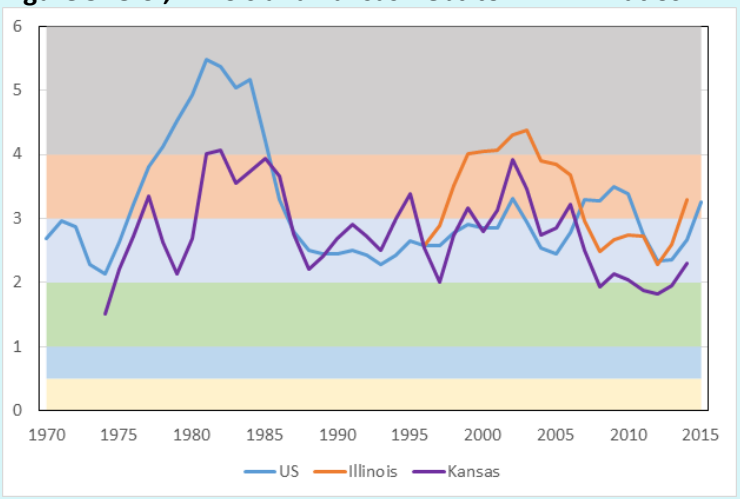
A two-year average of EBITDA is used to avoid larger annual swings in income. The Moody's ratings cut-off values for Debt-to-EBITDA varied slightly across the four methodologies. The values used for this analysis are provided in Table 1. In general, a rating of B or below is typically believed to be a speculative investment with significant or high credit risk, and Ca credits are highly speculative and near or in default.

Table 1. Rating Matrix for Debt to EBITDA Ratio

Rating Category	Debt to EBITDA Ratio
AAA	0 to 0.50
AA	0.51 to 1.00
A	1.01 to 2.00
Baa	2.01 to 3.00
Ba	3.01 to 4.00
B	4.01 to 6.00
Caa	6.01 to 8.00
Ca	> 8.00 or < 0

What Does the Alternative Indicator Tell Us about Farm Financial Stress?

Figure 5: U.S., Illinois and Kansas Debt-to-EBITDA Ratios

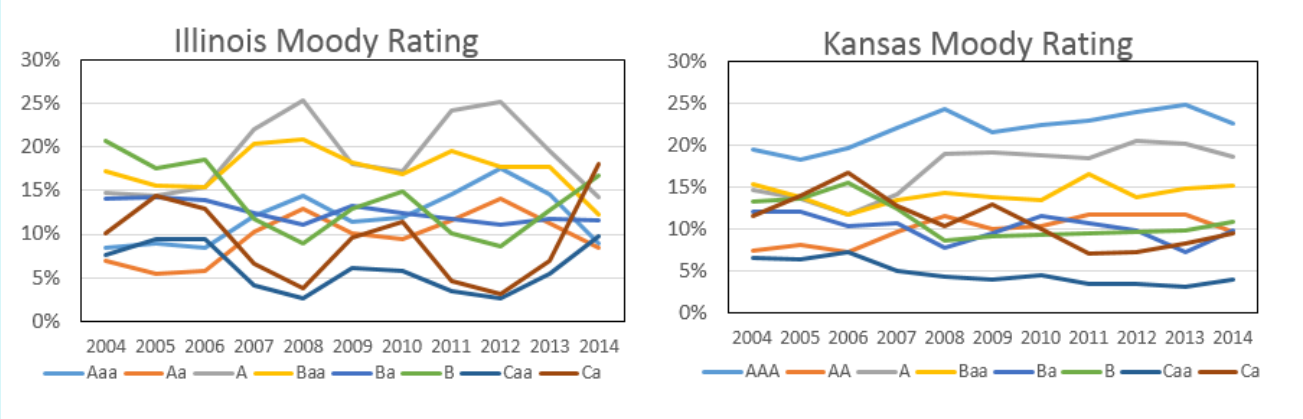


Source: USDA-ERS, 2016a, FBFM, 2016 and KFMA, 2016

As expected the average Debt-to-EBITDA Ratios exhibit higher variability over time than the debt-to-asset ratios (Figure 5). This measure is likely a better leading indicator of financial stress than the debt-to-asset ratio. The aggregate debt-to-asset ratios did not peak until 1985 and 1986 for farms in the United States and Kansas, whereas the Debt-to-EBITDA ratios were highest in 1981 and 1982 at the beginning of the farm financial crisis. Moreover, the financial stress in agriculture in the early 2000s is also more evident with the Debt-to-EBITDA measure.

Figure 6 shows the distribution of the Debt-to-EBITDA ratio across the synthetic Moody rating categories for Illinois and Kansas farms. Measures for Illinois farms are more variable than Kansas farms over the 11-year period, a likely result of lower enterprise diversity in Illinois. The proportion of farms with Caa and Ca ratings are at the highest levels over the 11-year period in 2014. The percentage of Illinois and Kansas farms in 2014 in the Caa and Ca categories was 27.8% and 13.4%, respectively. The percentage of farms in the Caa and Ca categories increased by 22.1% in Illinois and 2.7% in Kansas from 2012 to 2014. The percentage of farms in the highest two categories (AAA and AA) fell by 14.2% in Illinois over the last two years and by 4.4% in Kansas over the last year. Given that income levels decreased again in 2015, it is likely the proportion of lower-rated farms increased further. Debt servicing problems and carryover operating debt are likely to occur across many of the farms in these categories. However, over 55% of Illinois farms and over 75% of Kansas farms have ratings equal or better than Ba.

Figure 6: Distribution of Synthetic Moody Ratings for Illinois and Kansas Farms, 2003 - 2014



Source: FBFM, 2016 and KFMA, 2016

Importance of an Earlier Signal

The forecasted declines in net farm income will impact the ability of many producers to service debt obligations in the sector. Leverage measured by the debt-to-asset ratio, which is typically used to measure financial stress in the agricultural sector, does not provide information on a borrower's ability to service debt. For example, an operator who has a relatively low 10% debt-to-asset ratio, owns 100% of their farmland, and has purchased substantial machinery may be stressed to service that debt. This operation remains quite solvent, but will likely incur a cash shortfall when servicing debt and supporting family living, resulting in a potential increase in debt or reduction in working capital. Real estate and machinery values may also decrease, leading to an increase in debt-to-asset ratios. The Debt-to-EBITDA measures provide an earlier signal of changes in financial stress in that the ability to meet cash expenses can be a precursor to a need to begin liquidating assets into relatively thin agricultural asset markets.

For More Information

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