

Testimony
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Mr. Chairman Scott, Ranking Member Scott, and Members of the Commodity Exchanges, Energy, and Credit Subcommittee of the House Committee on Agriculture; I want to thank you for inviting me to testify. My name is Allen Featherstone, Professor and Head of the Department of Agricultural Economics, Kansas State University.

The agricultural economy suffered from two major boom-bust cycles in the 20th century. The first occurred in the 1920s through the mid-1930s and the second from 1973 to 1986. With the recent decline in net farm income, lenders, farmers, and policymakers are beginning to question whether 2007 was the start of another major boom-bust cycle with 2015 being the beginning of a bust period. There are similarities with the 1973 to 1986 cycle, but there are also differences. The last two cycles developed differently, and when the next cycle occurs, it will likely be unlike the previous cycles.

U.S. net farm income has declined from \$123.3 billion in 2013 to a forecasted amount of \$56.4 billion in 2015 and by another \$1.6 billion forecasted for 2016 (USDA-ERS). With a 56% decrease in U.S. net farm income occurring over a three-year period, concern has begun to arise regarding the future direction of cash rents and land values along with the overall credit situation; the bust phase of a major agricultural readjustment. While the balance sheet of the production agriculture sector was strong at the end of 2015 due to several years of sector profitability, declining net farm incomes could negatively affect land values causing the balance sheet to erode because the value of land represents in excess of 75% of the asset values on the farm balance sheet.

Kansas State University works with roughly 2,000 farmers statewide through the Kansas Farm Management Associations. These commercial producers provide balance sheet and income statement information to the Department of Agricultural Economics that allows the understanding of the distribution in financial performance and provides an overall financial picture of Kansas farms.

The Current Situation

An understanding of the current situation begins by examining the net farm income from the U.S., Kansas, and North Central Kansas (Figure 1). The Kansas and North Central Kansas numbers are dollars per farm and are measured on the left-side of the axis. The aggregate U.S. net farm income are measured in billions of dollars and are on the right axis. Before 2007, average net farm income per farm in North Central Kansas ranged in the \$43,000 to \$53,000 per year. Beginning in 2007, net farm income increased to between \$85,000 and \$150,000 per farm through 2014, eight years of excellent profitability. In 2015, average net farm income in this region dropped precipitously from an average of \$102,508 in 2014 to a 2015 average of \$11,452, an 89% reduction. This was the lowest average level of nominal net farm income for that region since 1985.

The North Central region in Kansas (Figure 1) is the first association in the state of Kansas with completed information for 2015, and indicates a dramatic change in the profitability of production agriculture. Based on preliminary analysis of the other five Kansas Farm Management Associations (KFMA) within the state for 2015, declines in incomes of this magnitude will be common across all of Kansas and likely for similar agricultural production regions in the Midwest and Great Plains. In addition, it is important to observe the similarity in U.S. and Kansas trends in Figure 1.

Agricultural land values are an important factor in the overall well-being of the production agriculture sector given that they represent roughly 80% of the assets on a farmer's balance sheet. Land serves as collateral and enhances a farmer's ability to obtain credit. Thus, decreases in land values affect the ability to obtain credit. According to USDA, from 2006 through 2015, U.S. average cropland value increased from \$2,300 to \$4,130 per acre, an increase of roughly 80%. Taking into account inflation, agricultural land values increased by roughly 55% in real terms. Figure 2 provides a view of Kansas agricultural land values since 1950 adjusted for inflation. Using 2015 as a base, inflation adjusted land values in 1973, the beginning of the last boom-bust period, were about \$800 per acre in Kansas. Inflation-adjusted land values peaked in 1980 at roughly \$1,470, an increase of 85%. Inflation-adjusted land values subsequently fell to \$690 in 1987, a decline of 53% from the peak. Agricultural land values in Kansas in 2015 are 101% higher than they were in 2006 in inflation-adjusted terms. They are also 38% higher than the peak of the last boom-bust cycle in real terms in Kansas.

Agricultural land markets are driven by the returns to land, farm returns and non-agricultural factors such as development potential and recreational returns. Therefore, not all states or regions of the United States are experiencing the situation that the Corn Belt, Great Plains, and South are currently experiencing. The inflation-adjusted increase in agricultural land values since 2006 (blue) and the 2015 land value percentage increase from the 1978 to 1983 high for various states (orange) are in Figure 3. Since 2006, Illinois, Oklahoma, and Texas (Corn Belt and Great Plains states) have experienced greater than a 30% increase in agricultural land values. For these three states, current land values are 46% (Illinois), 10% (Oklahoma), and 65% (Texas) higher than the inflation-adjusted peak in the last boom-bust cycle. Thus, the land value experience is not homogeneous among states and regions of the U.S. The Corn Belt and the Great Plains experience is different than much of the rest of the U.S.

Credit Conditions

The Department of Agricultural Economics at Kansas State University, in conjunction with Brady Brewer at the University of Georgia, conducts a semi-annual nationwide survey of lenders to understand agricultural credit conditions. The most recent survey was conducted the 2nd half of March 2016 and uses a similar methodology to the University of Michigan consumer sentiment survey. The survey obtains agricultural lender sentiment on interest rates, spread over the cost of funds, farm loan volume, non-performing loans, and land values for the last three months, the next year, and the longer term (2 to 5 years). As an example, participants are asked whether they expect interest rates will increase, decrease, or remain the same. If all survey participants indicate that an item is expected to increase, the index is 200. If all indicate an item is expected to decrease, the index is zero. If an equal amount of lenders expects an item to increase as expect an item to decrease, the value is 100.

While this survey is nationwide, responses are concentrated in the Midwest and the Great Plains, and to a lesser extent in the South and the Atlantic region. The survey respondents are mainly employed by commercial banks or the Farm Credit System. The complete report can be found at <http://www.ageconomics.k-state.edu/research/ag-lender-survey/index.html>. Several important

changes have occurred in the agricultural economy since the fall 2015 survey (Figure 4). Non-performing loans have increased during the past three months as during the spring 2016 survey window, 43% of participants indicate that non-performing loans have increased compared to 12% during the Fall 2015 survey window. Agricultural lenders expect that non-performing loans will increase during the next year, 77% in the spring of 2016 compared to 53% in the fall of 2015. Over the next 2 to 5 years, the sentiment is that non-performing loans will increase, but that sentiment has lessened slightly over the last two surveys. Looking at non-performing loans by crop industry sector, non-performing loans are expected to increase for corn and soybean farms and wheat farms. For the livestock sector, agricultural lenders expect more non-performing loans for beef farms and dairy farms.

The survey also measures lender expectations on agricultural land values (Figure 5). During the spring 2016 survey window, 48% of agricultural lenders indicate that land values decreased and 45% indicate that they remained the same, and 6% indicate they increased during the previous three months. The spring 2015 results indicated that 35% indicated decreases, 57% indicated no change, and 8% indicated increasing land values for the previous three months. The expectation of land value changes in the next year became markedly more negative from the fall of 2015 to the spring of 2016 with the index falling from 32 to 16. Currently 84% of lenders expect land values to fall over the next year and 16% expect they will remain the same. For the longer term, the sentiment has not changed much over the last four surveys; roughly 65% expect decreases, 25% expect no change, and the remainder expect land price increases. The overall sentiment by agricultural lenders turned more pessimistic from the fall of 2015 to the spring of 2016.

The survey provides lenders the opportunity to add any other open-ended comments they would like to make. Table 1 reports the comments from those lenders that chose to provide them. Certainly some lenders are experiencing difficult agricultural lending conditions.

Measuring Financial Stress

The concern expressed by agricultural lenders indicate the importance of measuring financial stress. One measure that is commonly used is the debt-to-asset ratio. Figure 6 from a forthcoming *Choices* article by Paul Ellinger (University of Illinois), Allen Featherstone, and Michael Boehlje (Purdue University) takes a look at alternative measures of financial stress. The average debt-to-asset ratio in Kansas and Illinois was greater than 30% in 2001 and 2002 and it has generally declined to 19% for both states by the end of 2014, the most recent data available. The average debt-to-asset ratios did not peak until 1985 and 1986 the United States and Kansas, the end of the last boom-bust cycle.

The use of an average debt-to-asset ratio as a measure of financial stress without examining the distributional characteristics across agricultural producers may be incomplete. A study by Featherstone and Chris Boessen (University of Missouri) published in the *North Central Journal of Agricultural Economics* in 1994 examined the loan loss experience of a nationwide lender, Equitable Agribusiness during the 1980s farm crisis. They found that 75% of the loans that defaulted were originated from 1977 to 1980. They also found that 80% of loans defaulted from 1983 to 1986. The loans that defaulted were made during the time just before the land values peaked and most performed for 5 to 6 years before they defaulted. They further report that only 10.9% of loans made from 1977 to 1980 defaulted, the worst time to be lending to agriculture, *ex-post*. Thus, it is important to examine the margin and not the average. During the last financial crisis, many farmers experienced financial stress; however, it was a minority of the producers moving the sector average. Because, in the Midwest where only 2% to 4%

of agricultural land is sold each year, small increases in the land on the market can cause significant land price changes.

Figure 7 measures the distribution of debt-to-asset ratios for Illinois Farm Business Farm Management (FBFM) farms. 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. Figure 7 indicates that 8.7% of Illinois farmers did not meet this underwriting standard at the end of 2014.

An alternative measure that Ellinger, Featherstone and Boehlje propose is the Debt-to-EBITDA ratio. In many respects, the use of a debt-to-asset ratio is indicative of a lending era that has passed as the agricultural lending sector has moved from a collateral based lending system (debt-to-assets) to a cash flow based lending system (Debt-to-EBITDA). This measure is used in corporate lending and can be compared to a Moody's ratings system. In general, a rating of B or below is typically believed to be a speculative investment with significant or high credit risk, and Ca ratings are highly speculative and near or in default. The Debt-to-EBITDA ratios exhibit higher variability over time than the debt-to-asset ratios (Figure 8). Ellinger, Featherstone, and Boehlje found that 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. Thus, the debt-to-asset ratio may be more of a lagging indicator. Moreover, the financial stress in agriculture in the early 2000s is also more evident with the Debt-to-EBITDA measure.

While the averages, are useful, the distribution of farms are important. Ellinger, Featherstone and Boehlje report that the proportion of farms with Caa and Ca ratings at the end of 2014 were 27.8% and 13.4% for Illinois and Kansas, respectively and had increased from the 2012 levels of 5.7% in Illinois and 10.7% in Kansas. In addition, 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.

From 2014 to 2015, the average North Central Kansas Debt-to-EBITDA ratio using data from 243 farms increased from 2.45 to 4.20 or two rating classes (Figure 9). A similar net-farm income in 2016 for North Central Kansas with no change in debt would increase the ratio to 6.54 and into the Caa category. Other notable changes that occurred on North Central farms in 2015 was a reduction in average working capital from \$313,131 to \$230,250. This represents a reduction of \$82,881 per farm or 26.5%. The working capital to assets ratio fell from 12.9% to 9.6%. The average debt-to-asset ratio increase from 21.8% to 23.0%.

Comparisons with the 1980s

Data on individual farms are available from the KFMA since 1973. This allows a comparison of the condition at the end of 2014 with the condition of farms in 1979; two years before the bust began. Featherstone, Roessler, and Barry estimated a synthetic Standard & Poor's credit scoring model using Farm Credit Loans based on three origination ratios; a leverage ratio, a working capital percentage ratio, and a capital debt repayment capacity ratio. Their study is available in volume 28 issue 1 of the *Review of Agricultural Economics*. This model was used to synthetically rate each farm in the KFMA data, each year assuming all the loans were new loans. The results of this analysis allows comparison of the situation at the end of 1979 with the current situation (Figure 10). The distribution indicates that the 2014 distribution has a slightly higher percentage of farms rated in the BB and BB+ range and a slightly fewer percentage of farms rated in the BB-, B+, and B ranges than in 1979. Thus, the financial condition

of farms is slightly higher in 2014 than it was in 1979. However, the situation changed very quickly from 1979 to 1981.

Similarly, the distribution of the debt-to-asset ratios were also compared. In 1979, the average debt-to-asset ratio was 24.6%, while it was 19.0% at the of 2014. There were 19.4% of the farms with a debt-to-asset ratio greater than 40% in 1979, compared to 12.6% in 2014. Finally, there were 1.3% of the farms with a debt-to-asset ratio greater than 70% in 1979 compared with 2.3% in 2014. Thus the sector at the end of 2014 was in a moderately better leverage position compared to 1979.

The Farm Safety Net

One of the major questions agricultural producers and lenders have as we enter a low price environment is the ability of the farm safety net to alleviate significant financial hardship in the sector. The farm safety net currently consists of crop insurance and either the ARC or PLC programs. Revenue insurance products have been valuable in Kansas for farmers managing through an extended drought. Table 2 presents an example of the minimum revenue guarantee for corn assuming a 150-bushel production history and a coverage election of 80%. The lower bound on coverage per acre for corn has declined from \$678 per acre in 2013 to \$463 per acre in 2016 with the declining corn price. This represents a 32% increase in the amount of risk that a farmer is bearing. Similar changes occur for soybeans (31%) and winter wheat (41%). Thus, farmers are managing a substantially higher level of risk with the 2016 crops than they were just three years ago.

While the levels of revenue guaranteed have been dropping, the cost of production per acre has been increasing. Table 3 illustrates the *ex-post* variable and total cost of production for non-irrigated corn and soybean production from the KFMA gathered from actual farm records. From 2006, the variable cost per acre for corn production increased from \$191 to \$322 per acre, an increase of nearly 70%. The variable cost for soybean production increased from \$125 to \$229 per acre, an increase of nearly 83%.

Land Value Effects

With the decline in net farm incomes, concerns arise with regards to the potential land value effects. Taylor, Featherstone, and Gibson have estimated the relationship between net farm income, cash rents, and land values in Kansas. Using the net present value model, the agricultural land market in Kansas and data from 1973 to 2012, the relationship between land values and net farm income was estimated. They found that land adjusts to changes in net farm income slowly with a one-year elasticity at the state level of 6.7%. The long-run elasticity is 96.9%, which is very close to the 100% suggested by the income capitalization model. At the state level, the long-run multiplier for income in Kansas is 21.71 which implies a capitalization rate of 4.61%.

These estimates were used to forecast changes in Kansas land values given futures prices and income expectations, *ceteris paribus*. Futures prices were collected for the harvest time contracts through 2018 for the July contract from the Kansas City Board of Trade for wheat and from the Chicago Board of Trade for the December contract for corn and the November contract for soybeans. These prices were adjusted for historical basis and used to forecast net farm income through 2018. Figure 11 presents the historical corn and soybean price received and the expected basis-adjusted price into the future for corn and soybeans. In addition, the net farm income was calculated based using expected trend yield and the price expectations.

Corn prices received by Kansas farmers are expected to remain at around the \$4.00 per bushel range through 2018, while soybean prices received are expected to remain around the \$8.50 per bushel range (Figure 11). Net farm income was the highest in 2012 at \$81.91 per acre. That amount is expected to decline to \$49.01 for 2016. After 2016, net farm incomes are expected to increase to \$53.04 per acre in 2018.

The estimated results suggest that Kansas land values would peak in 2016 and begin to slowly decline. If market conditions were to remain the same, land values could ultimately decrease to \$1,171 per acre, a 28% decline from current levels assuming the land price earnings multiple returns to the longer term average of 4.61%. Declines of this magnitude could negatively affect the financial condition of the sector.

Conclusions

In conclusion, the declining net farm income in 2015, has made for an uncertain agricultural lending environment. The agricultural production sector and the agricultural lending sectors are intertwined causing many lenders to be asking the same questions as agricultural producers regarding the future of production agriculture as they make decisions regarding loan restructuring and other normal lending decisions. If the sector is entering a major readjustment phase, several important factors should be considered.

- 1) The averages will not drive a bust, but the lower tail of the distribution can. Therefore, more attention needs to be paid to the distribution of financial performance and less on the averages.
- 2) Given the thinness of agricultural land markets, small increases in land parcels being liquidated can have major effects of the price of land.
- 3) The debt-to-asset ratio was more of a lagging indicator of financial stress during the 1980s boom-bust cycle whereas the Debt-to-EBITDA ratio was more of a leading indicator.
- 4) The lending industry has moved more to a cash flow based loan assessment and less of a collateral based loan assessment.
- 5) Farmers and agricultural lenders are entering the current downturn in a strong financial position because of several years of excellent profitability.
- 6) Relative to entering adjustment phase in the 1980s, farms are in a moderately stronger financial position.

2016 will be a pivotal year in production agriculture. Given that average net farm income in some regions were the lowest they have been since 1985, a repeat of that in 2016 will cause some agricultural producers and lenders to make difficult decisions before entering the spring of 2017.

Thank you.

Table 1. Opened-Ended Comments from the Spring 2016 Kansas State Agricultural Lender Survey

“The ag finance environment is tough. 2015 was very tough. Projections for 2016 look worse.”
“Cropland values have declined 15-25% depending on quality. Pasture values have stayed fairly constant, although the lack of sales might indicate that they are priced too high given the market.”
“With these crop prices expect a significant gut check by the producers. I am seeing significant decrease in capital purchases and family living. I expect other operating expenses to follow.”
“We are in the early stages of a major correction in the Ag economy. Given the accumulation of corn & soybean inventories, this could be a prolonged and painful process. Eventually an equilibrium of costs and revenues will be reached and the Ag economy will stabilize. The producers that made conservative decisions will weather the storm, others will need to make major adjustments or fail. We have seen a 20% reduction in AG real estate values with more reductions to follow. We are seeing values of farm equipment fall by up to 33%. I expect further softness in Ag equipment to follow as forced liquidations place more equipment on the market and this market will need to find market clearing price levels.”
“Stronger dollar is putting pressure on margins in virtually all Ag sectors. Dairy has held up surprisingly well vs world market due to domestic demand for butterfat. Expecting tighter margins for cow/calf ahead as we are into herd building, expect feedyard margins to improve in last quarter of 2016. Potato and onion margins remain tight and expecting to remain tight as alternative crops which compete for acreage struggle to provide positive margins. The last seven or so years have been very profitable for tree fruit which has spurred orchard development. With new orchard acres and more productive plantings coming on line it is expected that tree fruit will be coming under pressure for next half dozen years.”
“We only have one farm loan that is classified. If commodity prices remain low, could be more in the future.”

Table 2. Crop Revenue Coverage Minimum Revenue Guarantee Example for Corn, 2013-2016

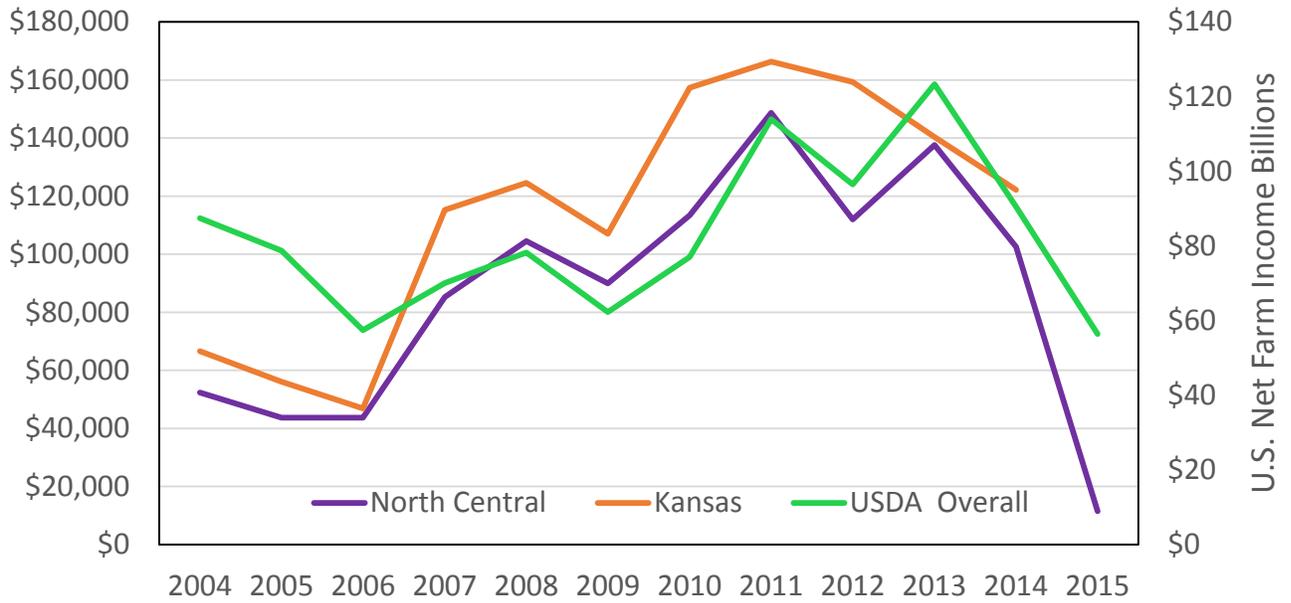
	2013	2014	2015	2016
APH (bushel)	150	150	150	150
Coverage Election	80%	80%	80%	80%
Guaranteed Bushel	120	120	120	120
Base Price (per bushel)	\$5.65	\$4.62	\$4.15	\$3.86
Coverage (per acre)	\$678	\$554	\$498	\$463

Table 3. KFMA Non-Irrigated Corn and Soybean Cost of Production per Acre

	Corn		Soybean	
	Variable Cost	Total Cost	Variable Cost	Total Cost
2005	\$188	\$263	\$118	\$177
2006	\$191	\$269	\$125	\$183
2007	\$231	\$331	\$145	\$229
2008	\$265	\$374	\$167	\$250
2009	\$267	\$371	\$173	\$261
2010	\$268	\$382	\$176	\$268
2011	\$281	\$391	\$192	\$286
2012	\$325	\$435	\$202	\$299
2013	\$308	\$420	\$224	\$342
2014	\$322	\$447	\$229	\$339

Source: KFMA, 2016

Figure 1. U.S., North Central Kansas, and Kansas Net Farm Income



Source: USDA-ERS, 2016, KFMA, 2016

Figure 2. Kansas Inflation-adjusted Land Values, 1950 through 2015

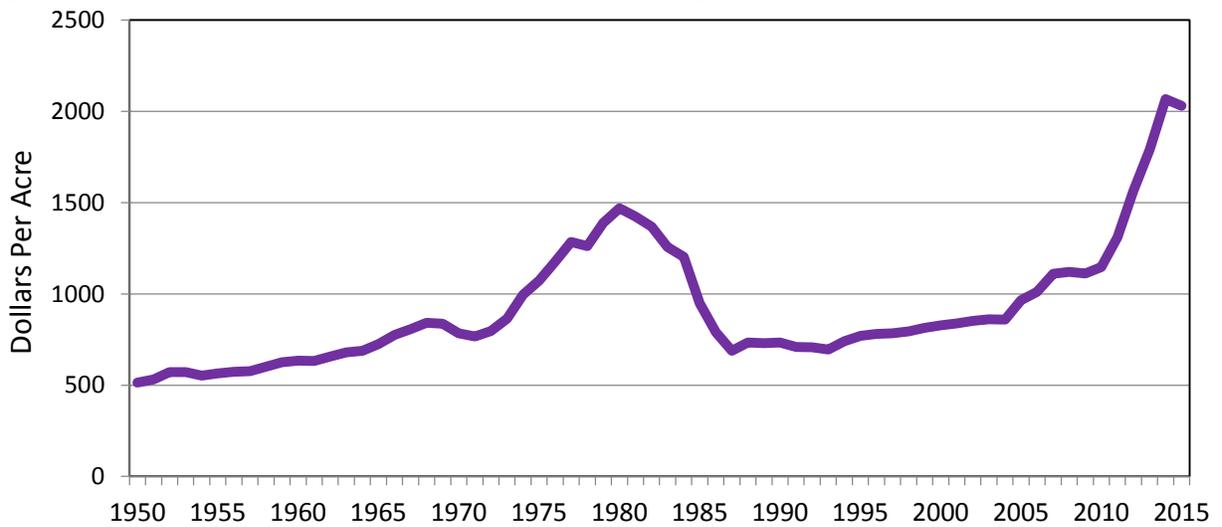


Figure 3. Inflation-adjusted Land Value Price Changes since 2006 and the 1980s for Selected States

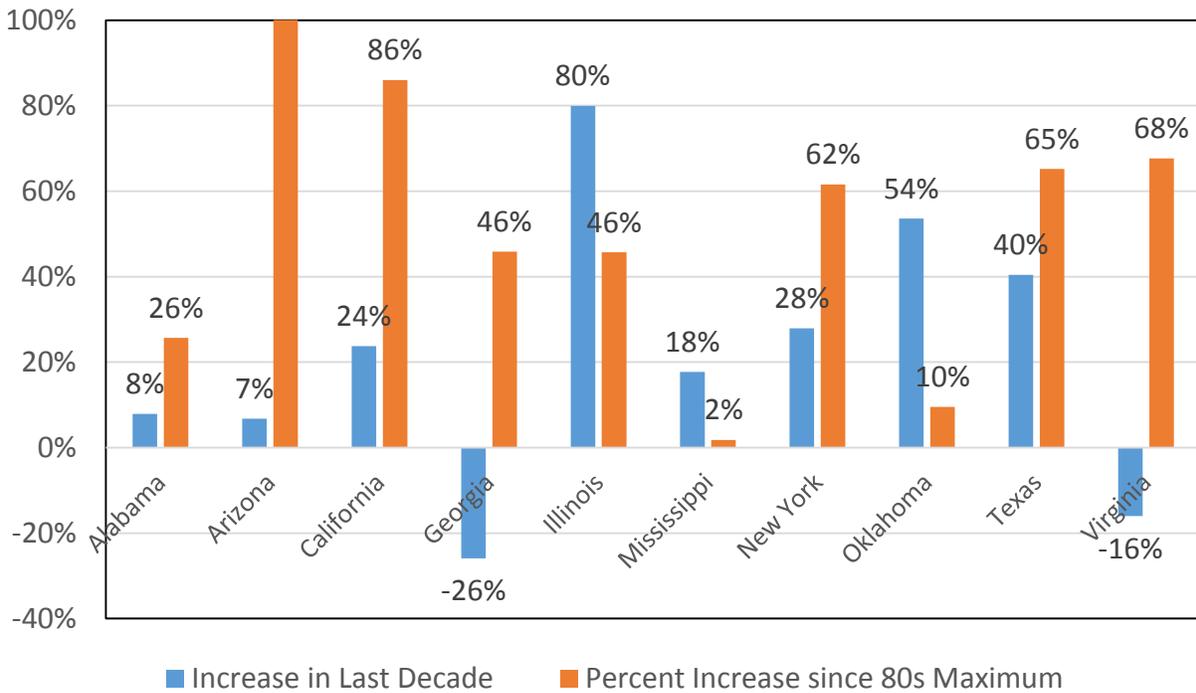
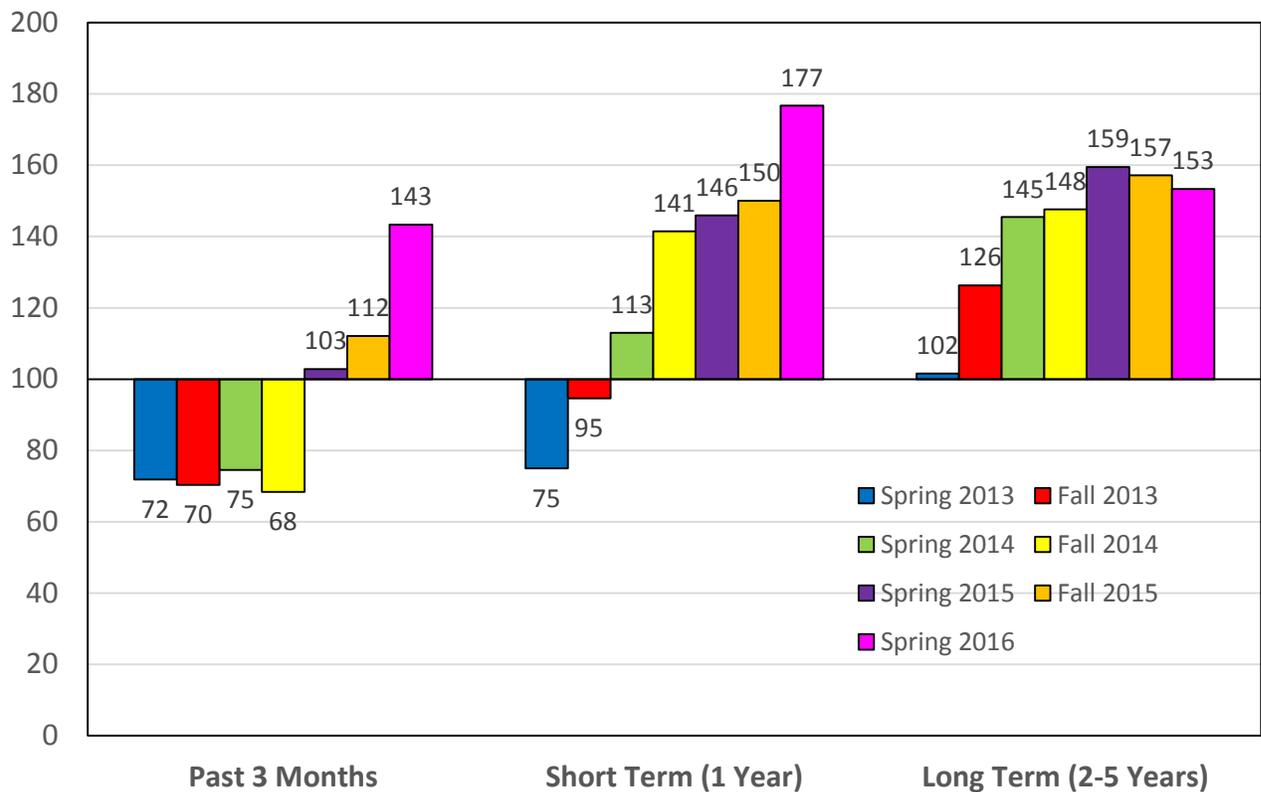
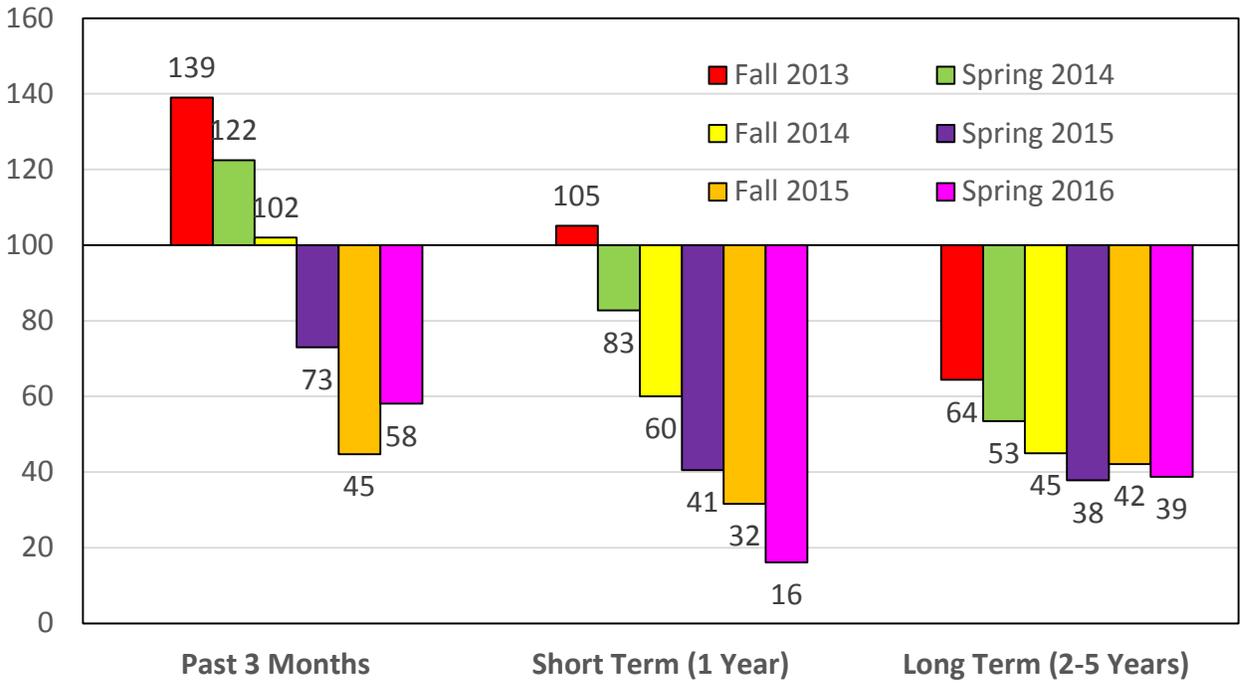


Figure 4. Non-Performing Total Farm Loans – Diffusion Index of Survey Respondents



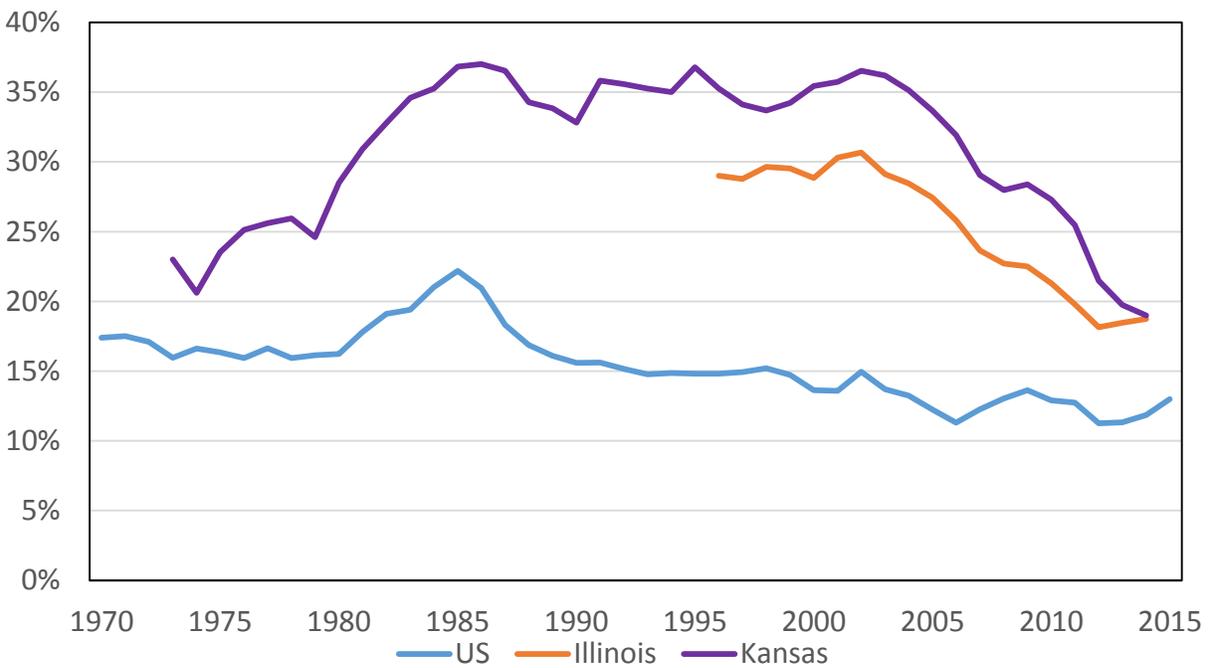
Source: Brewer, Featherstone, Wilson, and Briggeman

Figure 5. Land Value Price Expectations.



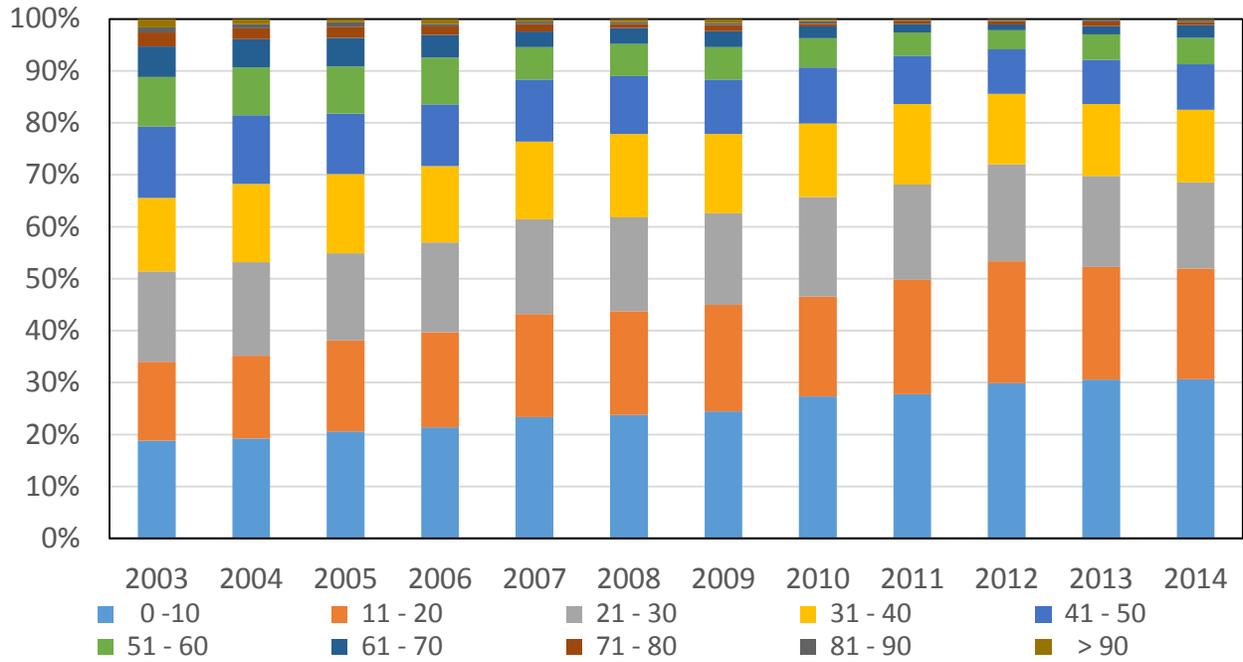
Source: Brewer, Featherstone, Wilson, and Briggeman

Figure 6. United States, Illinois, and Kansas Debt-to-Asset Ratios



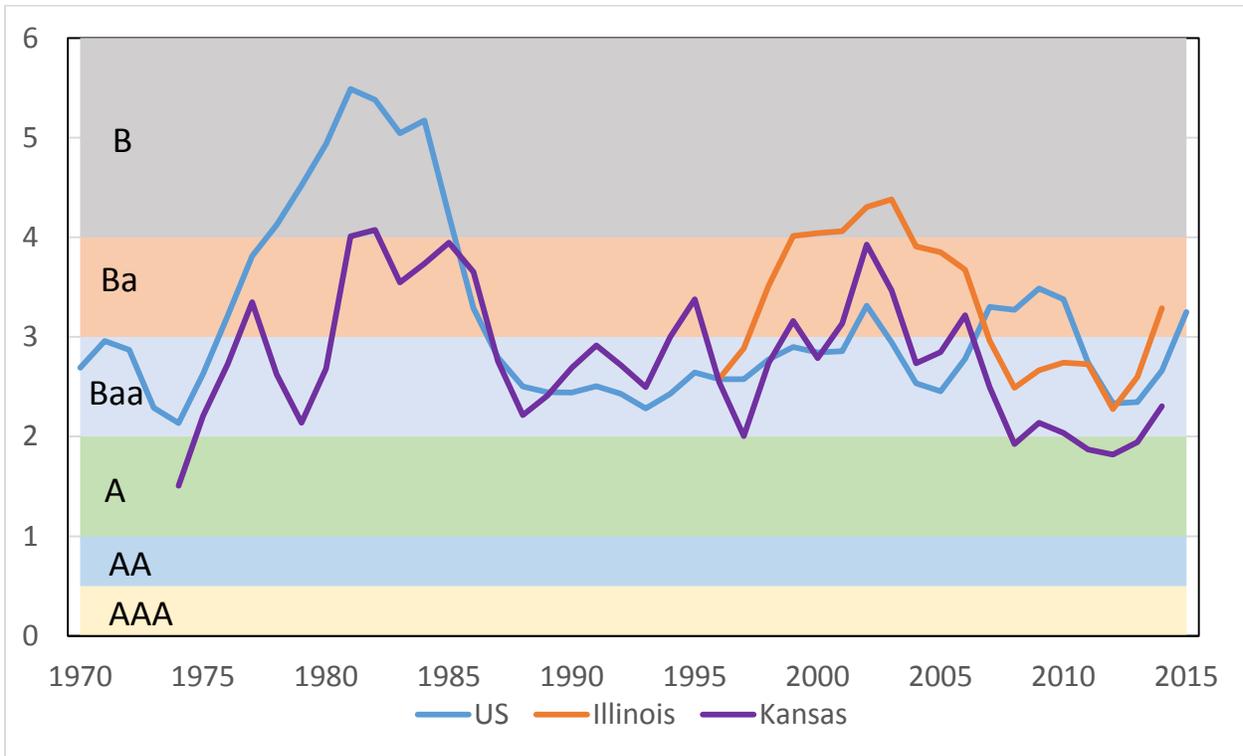
Source: Ellinger, Featherstone, and Boehlje

Figure 7. Distribution of Debt-to-Asset Ratios for Illinois Farms, 2003-2014



Source: FBFM, 2016

Figure 8. U.S., Illinois and Kansas Debt-to-EBITDA Ratios



Source: Ellinger, Featherstone, Boehlje

Figure 9. U.S., Kansas, and North Central Kansas Debt-to-EBITDA Ratios

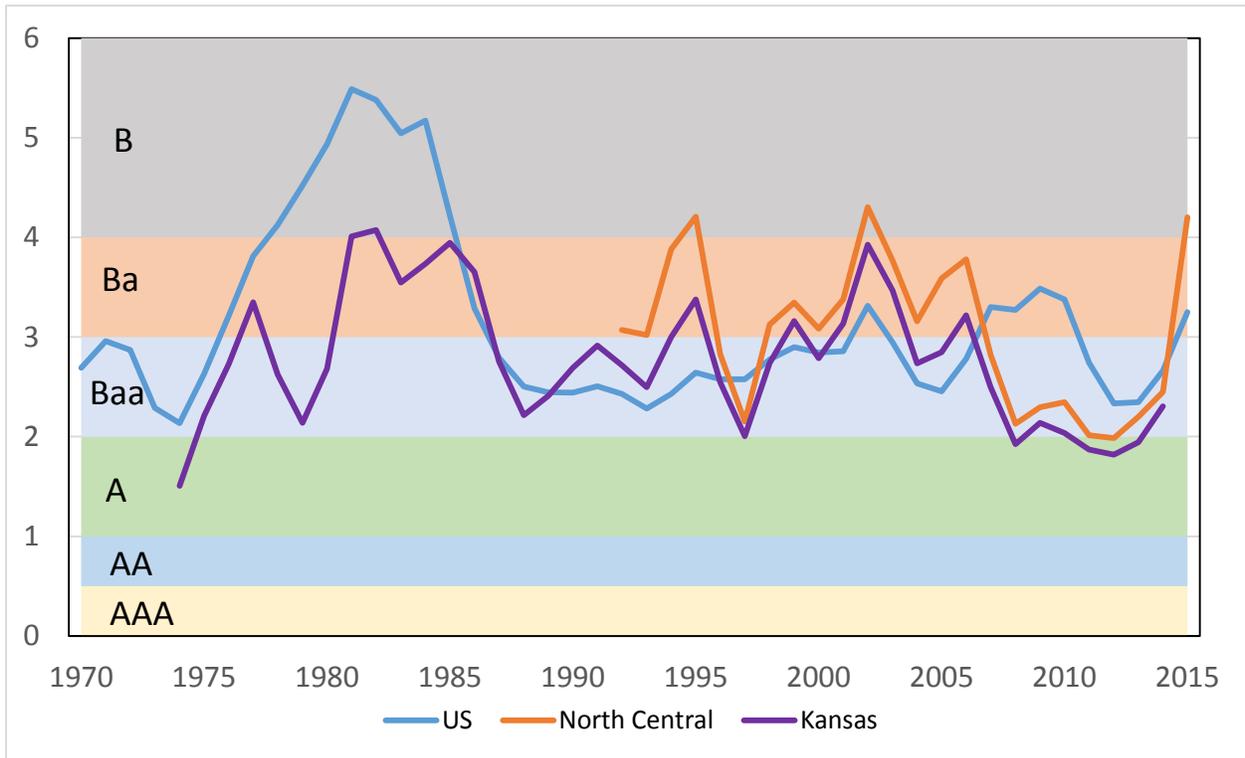


Figure 10. Synthetic Credit Ratings of Kansas Farm Management Association Farms, 1979 and 2014

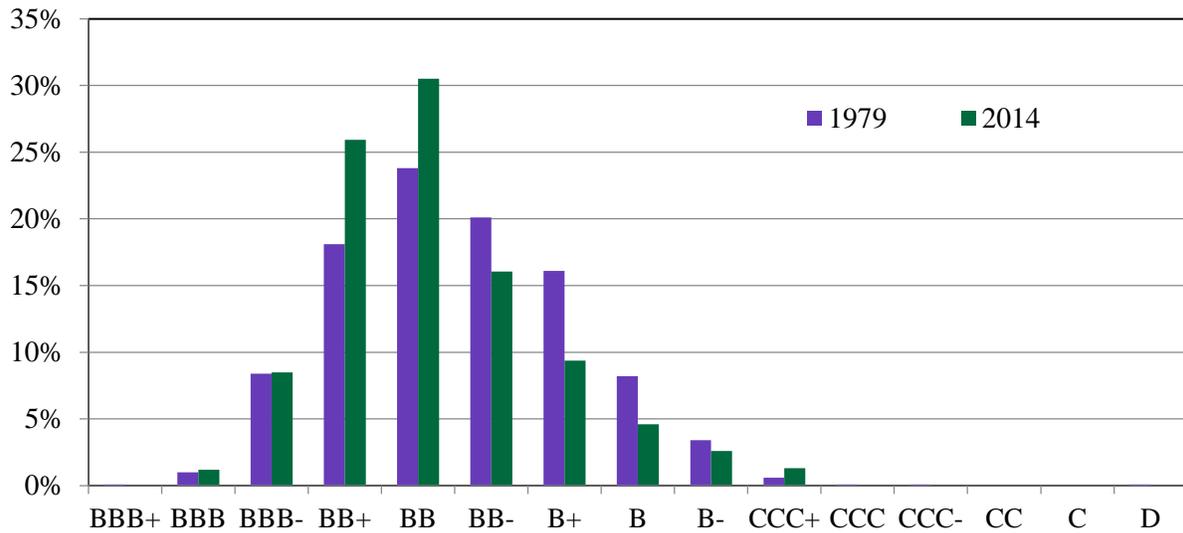


Figure 11. Expected Corn and Soybean Prices and Net Farm Income in Kansas, 2016 - 2018

