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**Farm Financial Stress in Oklahoma:
The Effects of Price Change and Debt**

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Abstract

After historically high levels of net farm income in 2012 and 2013, low commodity and livestock prices have combined with other factors to dramatically reduce farm income. These changes create financial stress for farmers, degrades the value of farmland and other farm assets, and has implications for agricultural credit markets and relationships. Most farmers and ranchers are looking for ways to improve financial performance, but more importantly are looking for information on how to mitigate the effects of financial stress in their operations. Active farmers and ranchers need information to survive the current and future periods of farm financial stress. The purpose of this research is to explore the extent of recent farm financial stress, and to determine what factors are contributing to the current cycle of farm financial stress. Specifically, we explore recent trends in farm income and farm debt, compare current farm financial position and performance to previous years, and determine factors that are associated with successful transition through periods of farm financial stress. This research examines the effect that leverage, and prices have on the intermediate survival of a farm business. The findings of the research will provide further insight into the conditions that create and enhance farm financial stress.

JEL codes: Q14, Q19

Keywords: financial stress, price shock, financial performance

After historically high levels of net farm income in 2012 and 2013, low commodity and livestock prices have combined with other factors to dramatically reduce farm income (Kauffman and Clark 2016). These changes create financial stress for farmers, degrades the value of farmland and other farm assets, and has implications for agricultural credit markets and relationships. Most farmers and ranchers are looking for ways to improve financial performance, but more importantly are looking for information on how to mitigate the effects of financial stress in their operations. Active farmers and ranchers need information to survive the current and future periods of farm financial stress.

In broad terms, farm financial stress is a problem that can result in farmers taking actions that range from simply cutting back on planned purchases and family living standards to liquidating assets to pay bills, and even complete bankruptcies. All these actions have long-term impacts on not only those individual farmers and farm families, but also on rural communities, input suppliers, and others (Boehlje, Thamodaran, and Barkema 1985). More specifically, farm financial stress contributes to personal and financial stress within farm households and farm families.

The seeds of the farm crisis of the 1980s was sown during the previous decade. The 1970s were a decade of prosperity for American agriculture. Over the first three years of the decade, net farm income doubled from \$34 billion to \$69 billion and the value of farmland increased 73% (in real 1982 dollars). This expansion of agriculture was largely debt financed, with outstanding farm mortgage debt increasing 57% between 1970 and 1978 (Barnett 2000). The increase in debt was supported by increased commodity prices and production, with US Secretary of Agriculture, Earl Butz, famously telling farmers in 1972 to “plant fence row to fence row” (Wyant 2008). In hindsight, this strong commodity market would only last for a short time, but long enough to make debt financing attractive. Soon, commodity prices would reverse course in response to the increased production.

Beginning in the late 1970s, commodity prices began to decline due to excess supply in the market, production costs rose at the same time, and the export boom collapsed, creating a perfect storm for financial stress. Eventually, agricultural producers could no longer make loan payments on farmland with the returns generated from farming that land. From 1981 to February 1985, the dollar appreciated more than 70% causing exports of domestic agriculture commodities to drop 50% by 1986. Declining exports coupled with low commodity prices, rising inflation, and drought sent net farm income and farm asset values into a downward spiral. Between 1980 and 1987, the value of farm assets, nationally, dropped 30% and as a result, farm lenders stopped offering to refinance loans when a borrower was unable to make payment (Barnett 2000).

Recently, there have been financial indications that agriculture is on the cusp of a new era of financial stress. Prices for corn, wheat, and soybeans were lower in 2016 than they were in 2007 and 2011 (USDA 2017). The *Ag Finance Databook*, published by the Kansas City branch of the Federal Reserve also reveals that the total volume of loans taken to pay for operating expenses has increased from 2016 to 2017. In the same time period, delinquency rates at commercial banks also increased (Kauffman and Clark 2017). This research examines the effect that leverage, and prices have on the intermediate survival of a farm business.

Literature Review

Financial stress cannot be perfectly quantified. Since the farm crisis of the 1980s, multiple definitions and metrics have been used to evaluate financial stress in the agriculture sector, but there is not one that better models the causes, nature or effect of financial stress. Financial stress has been evaluated based off a range of criteria including measuring liquidity, profitability, debt repayment capacity, and risk. Along with multiple metrics, multiple definitions have been developed as to what constitutes financial stress. Briggeman (2010) says it is “the inability to meet debt service payments, including principal and interest.” During the farm crisis, Jolly et al. (1985) defined farm financial stress as occurring when “the capacity of an individual or firm or a specific sector of the economy to adjust to the forces causing stress is exceeded.”

Studies done in the 1980s sought to derive the nature of the financial crisis and proposed potential solutions including to alleviate the effects of financial stress. Jolly et al. (1985) suggested that the duration of farm stress would depend on how quickly asset markets could rearrange ownership and credit institutions could write off unpayable debt and write new loans. Boehlje, Thamodaran and Barkema (1985) attributed the cause of the financial stress to be both lower incomes and more volatile interest rates. They suggested that asset restructuring, including liquidations, debt reductions, and equity infusions would be necessary to improve the long-term outlook for farms.

Burns, Tulamn and Harris (2015) approach the topic by using a three-step approach. First, they compare the debt repayment capacity utilization and debt to asset percentage using both old and new ARMS data. Second, they classify a farm’s financial position using a combination of the debt to asset percentage and net farm income. Lastly, they used a synthetic credit rating model to calculate the probability of default based on three criteria: capital debt repayment capacity, owner equity as a percentage of assets, and working capital as a percentage of assets. They found that a further decline in land values will only increase the leverage positions of certain sectors of the ag industry. Businesses with debt to asset ratios over 40 percent are more vulnerable, especially when combined with lower liquidity. Larger farms (those with sales exceeding \$1,000,000) are more vulnerable to a downturn in land values because they have higher debt to asset ratios, and rent the majority of their land. Additionally, net land renters are more vulnerable when land values drop 35 percent. They note that the current financial climate does not resemble the climate of the 1980s due to historically low interest rates and considerably lower mean leverage positions.

Benchmarks developed by the Oklahoma State University groups various levels of financial stress into a three-color system. The colors (green, yellow, and red) represents a good, fair, or poor farm financial position. Green zone farms have a debt to asset ratio of 0 to 30 percent, yellow zone farms have a debt to asset ratio of 31 to 59 percent and red zone farms have a debt to asset ratio of 60 percent or greater (Doye 2016). The Farm Financial Standards Council also uses this same method of benchmarking with slightly altered thresholds. We will use the Oklahoma State benchmark levels in this analysis. It is important to note that leverage is not the only or best measure of financial stress. A number of financial measures including measures of solvency, profitability, and debt repayment capacity can also be used to evaluate financial stress.

Conceptual Framework

All Farms

All machinery is financed on five-year, 3.25 percent fixed rate loans. All vehicles are financed on five-year, 5 percent fixed rate loan. All land is financed on 30-year, 2.5 percent fixed rate loan. We assume a 20 percent down payment on all equipment (tractors and implements), titled vehicles, and real estate. Tractors, implements and vehicles are sold at the end of year five and new machinery is purchased at the same time. Each representative farm has a machinery complement appropriate for the type of production that occurs.

To vary each farm's leverage position, we assume that the farm has already paid a certain portion of each loan. For equipment and titled vehicles, the low leverage farm has paid off 4 years of the loan, the medium leverage farm has paid off 3, and the high leverage farm has paid off 1. On livestock and cattle pens the low leverage farm has paid off 8 years of the loan, the medium leverage farm has paid off 6, and the high leverage farm has paid off 3. The real estate loan has 25 years paid off for the low leverage farm, year 15 years paid off for medium leverage and 5 years for high leverage.

Property tax is assumed to be \$2 per owned acre of land and personal property tax is assumed to be 1 percent of the market value of equipment. We assume that the farm operator has a spouse with an off-farm job that contributed \$40,000 to the business. \$60,000 per year is withdrawn for farm family living expenses. General farm liability insurance costs \$26,400 per year.

Crop Farm

The base representative crop farm is 444 acres (the average Oklahoma farm is 442 acres) (ODAFF 2017), of which 25 percent is owned and 75 percent is leased. Land is rented for \$31.60 per acre, the Oklahoma average from 2007 to 2016 (USDA 2017). Three crops are grown: winter wheat (representing cereal grains), corn (representing feed grains) and soybeans (representing oil crops). Each crop is allocated 148 acres. Corn yield is estimated to be 121 bushels per acre, wheat yield is 39 bushels per acre and soybean yield is 29 bushels per acre (ODAFF 2017). Prices are \$4.67 per bushel for corn, \$5.91 per bushel for wheat and \$10.72 per bushel for soybeans (USDA 2017). Yields are assumed to be constant throughout the 10-year simulation. All grain is sold as soon as it is harvested and not stored for future sale.

On the asset side of the balance sheet, the farm starts with \$30,000 in cash and checking in the low leverage case, \$20,000 for medium leverage and \$10,000 for high leverage. \$5,000 of prepaid expenses and supplies are held in each of the leverage scenarios. The farm utilizes a tractor, planter, seed drill as well as a truck totaling \$363,158 of intermediate assets. The 111 acres of owned land was purchased for \$1,800 per acre (USDA 2017). Long term assets also include \$25,000 of buildings and improvements for the low and medium leverage scenario. Additionally, the farm operator holds \$10,000 in cash and checking accounts and a \$250,000 life insurance policy.

Current liabilities are \$25,000 in the low leverage case, \$50,000 for medium leverage and \$75,000 for high leverage. Current loans include a revolving line of credit of \$15,000 in the low leverage case, \$25,000 for medium leverage and \$35,000 for high leverage at a 5 percent rate.

Cow-Calf

The base representative cow-calf operation has 300 cows and 10 bulls. The farm is 3,000 acres (10 acres per cow), 444 acres are owned, and the remaining 2,556 acres are leased at a rate of \$11.75 per acre, the Oklahoma average from 2007 to 2016. We use a conception rate of 87.3 percent and a death loss rate of 4.2 percent leaving 251 calves to sell each year (OSU 2017). Calves are sold immediately after they are weaned.

On the assets side of the balance sheet, the farm start with \$100,000 in cash and checking in the low leverage case, \$50,000 for medium leverage and \$10,000 for high leverage. \$10,000 of prepaid expenses and supplies are held in each of the leverage scenarios. The operation has 251 calves held for sale at the beginning of the simulation in addition to 30 cull cows and 5 cull bulls. A total of \$540,832 of intermediate assets are held. The 444 acres of owned land was purchased for \$1,800 per acre (USDA 2017). Long term assets also include \$250,000 of buildings and improvements. Additionally, the farm operator holds \$10,000 in cash and checking accounts and a \$250,000 life insurance policy.

Current liabilities are \$10,000 in the low leverage case, \$20,000 for medium leverage and \$30,000 for high leverage. Current loans include a revolving line of credit of \$20,000 in the low leverage case, \$40,000 for medium leverage and \$60,000 for high leverage at a 5 percent rate. The farm also incurs \$10,000 of hired labor each year.

Diversified

The base representative diversified operation has 444 acres of cropland and 3000 acres for a cow-calf operation. 888 acres are owned, and the remaining 2,556 acres are leased at a rate of \$11.75 per acre (USDA 2017).

On the asset side of the balance sheet, the farm starts with \$150,000 in cash and checking in the low leverage case, \$75,000 for medium leverage and \$50,000 for high leverage. \$20,000 of prepaid expenses and supplies are held in each of the leverage scenarios. A total of \$868,305 of intermediate assets are held. The 888 acres of owned land was purchased for \$1,800 per acre (USDA 2017). Long term assets also include \$250,000 of buildings and improvements. Additionally, the farm operator holds \$10,000 in cash and checking accounts and a \$250,000 life insurance policy.

Current liabilities are \$10,000 in the low leverage case, \$20,000 for medium leverage and \$30,000 for high leverage. Current loans include a revolving line of credit of \$20,000 in the low leverage case, \$40,000 for medium leverage and \$60,000 for high leverage at a 5 percent rate. The farm also incurs \$10,000 of hired labor each year.

Methods

For this analysis, three different representative farms were created, a crop farm, a cow-calf ranch, and a diversified farm that combined the crop and cow-calf farms into one operation. Each farm was analyzed at three leverage positions: low, medium, and high. The analysis was conducted in FINPACK® (FINPACK 2018).

First, budgets for each crop and livestock enterprise were created using information from Oklahoma State University Sample Enterprise Budgets (OSU 2017). We use 2017 Oklahoma Agricultural Statistics data to determine the average acreage of an Oklahoma farm (ODAFF 2017). Furthermore, data from the National Agricultural Statistics Service (NASS) were used to determine the 10-year average price for various crops and land rents. Next, balance sheets were created in FINPACK for each of the nine scenarios. Finally, each scenario was simulated 10 years forward using FINPACK's FINFLO feature to evaluate their financial standing at the end of the simulation.

Next, we run the simulations again imposing a two-year period of price shock using current prices with the other factors remaining the same. The prices for years 1 and 2 are amended to reflect current prices, with the prices in years 3 through 10 remaining at the 10-year average level. The prices changed to \$3.58/bu. for wheat, \$8.78/bu. for soybeans, \$3.32/bu. for corn (USDA 2018), and \$146.31/cwt for cattle (Market 2018).

Finally, we impose a four-year period of price shocks using current prices with the other factors remaining the same. The prices for years 1 through 4 are amended to reflect current prices, with the prices in years 5 through 10 remaining at the 10-year average level. We use the results of these simulations to look at measures of solvency, profitability, liquidity, and debt repayment capacity to better understand the causes, nature and potential extent of farm financial stress, and more importantly, what factors most influence farm financial performance.

Before the first year of the simulation, the low leveraged farms had a debt to asset ratio of 18 percent, the medium leverage farms had a debt to asset ratio of 40 percent and the high leveraged farms had a debt to asset ratio of 63 percent. Each leverage position was based off the Oklahoma Cooperative Extension Farm and Ranch Stress Test (Doye, 2016). To achieve the various leverage positions, the amount of current assets held in cash and checking is decreased, and liabilities increased proportionally as we move from the low leverage position to the high leverage position.

Results

Base Scenario Crop Farm

For the crop farm, serious liquidity issues exist in the medium and high leverage cases. The medium leverage farm is only liquid for one year of the simulation (Table 1). The situation is more variable when we evaluate solvency. The low leverage crop farm has a debt to asset ratio spike in years 5 and 6 due to new borrowing. Both the medium and low leverage farms end the simulation more solvent than it began. However, the high leverage farm becomes significantly insolvent in year 6 of the entire simulation, most likely forcing them to go out of business. The crop farm has profitability issues in each leverage position. The low and medium leverage simulations each have one year where their profitability is above 10 percent. When we evaluate the crop farm's repayment capacity, both the low and medium leverage scenarios have four years where their cash flows can cover their debt payments. The high leverage scenario has only one year where the farm is able to meet current debt obligations without the need for external borrowing.

Base Scenario Cow-Calf Farm

The liquidity of the cow-calf farm is like that of the crop farm except that the medium leverage farm does not have a year of good liquidity (Table 2). Over the ten years of the simulation, the solvency of the farm in each scenario improves from where they began. In the medium and high leverage cases, a slight increase in the debt to asset ratio occurs in years 5 and 6 respectively due to new borrowing. The cow-calf operation has some minor profitability issues in the low and medium leverage scenarios. The medium leverage farm has a good profitability position in year 2 through 4 and year 6. The high leverage farm is in a good profitability position for all years except the first. This could be due to the significantly higher value of the assets owned by the cow-calf farm as compared to the crop farm. The most significant difference between the crop farm and cow-calf farm is that the cow-calf farms, in each leverage position, can service all their debt payments with internal cash flow at some point during the simulation beginning in years 3, 5, and 8 for low, medium, and high leverage positions.

Base Scenario Diversified Farm

The diversified farm shows a much brighter picture than the previous two farms (Table 3). The diversified farm combines the crop and cow-calf operations, giving the diversified farm a larger asset base on which to operate. We find no liquidity issues in the low leverage scenario, and serious liquidity issues in the medium and high leverage cases. Evaluating solvency, each scenario declines from beginning to end (with an isolated jump in year 5 because of new borrowing). Both the medium and high leverage farms end the simulation in a better solvency class than they had in year 1 of the simulation. The low and medium leverage farms have mid-range profitability all ten years of the simulation. The high leverage farm has high profitability for years 2-10. The repayment capacity of the farm is good beginning in year 3 for the low and medium leverage scenarios. The high leverage case never has good repayment capacity, but does come close in years 5, 8, 9 & 10.

2 Year Shock Scenario

2 Year Shock Crop Farm

When we apply two years of price shocks to the crop farm, the result is marginally better than the base scenario (Table 4). We see three years of good current ratios in the low leverage scenario, but no good current ratios in the medium and high leverage cases. A 33 percent spike in the debt to asset ratio occurs between years 4 and 5 for the low leverage farm, but ends the simulation with a 7.6 percent debt to asset ratio. Similarly, in the medium leverage farm we observe a 16 percent increase between years 4 and 5, however it does not end as well as low leverage farm does, with the ending debt to asset ratio being only 1 percent less than the ratio in year 1. The debt to asset ratio for the high leverage case is almost 100 percent at the end of year 1, and exceeds 100 percent by year 2. This farm would most likely be forced to cease operation before year two began. The debt to equity ratios are all negative at the beginning (90% in the high leverage case). The medium leverage case has 3 years where return on equity is in the “low stress” area. Debt repayment is a problem at all leverage positions during year one. The low and medium leverage farms each have four years where debt obligations can be met by internal cash flow while the high leverage farm has only one year in which debt obligations can be met by internal cash flow.

2 Year Shock Cow-Calf Farm

Liquidity of the cow-calf farm is the same as the crop farm (Table 5). Solvency for the low leverage farm ends the simulation with a 0 percent debt to asset ratio. The medium leverage farm ends less leveraged than it was in the first year. The high leverage simulation ends with a lower ratio than the first year, but it is still highly leveraged. Except for year 1, the profitability is in the medium or low stress area each for each scenario. The low leverage farm has strong repayment capacity starting in year 3, medium leverage starting in year 5, and high leverage starting in year 8.

2 Year Shock Diversified Farm

The diversified farm's liquidity and solvency mirror that of the crop farm (Table 6). Except for year 1 (and 2 in the low leverage case), the profitability is in the medium or low stress area each for each scenario. The high leverage farm never has a strong debt repayment capacity, but the low and medium leverage do in years 3 and 5 respectively.

4 Year Shock Scenario

4 Year Shock Crop Farm

In the 4-year price shock scenario, we see a bleak picture for the crop farm (Table 7). No current ratio exists that is outside the "high stress" area. The solvency of the business deteriorates in each scenario. The debt to asset ratio ends 10 percent higher in the low leverage case, 26 percent higher in the medium leverage case, and 67 percent higher for the high leverage farm. The medium leverage farm has good profitability for four of the ten years, but large negative return on equity ratios exist in each leverage scenario. The same situation exists for debt repayment. Each leverage case has four years of negative ratios, meaning that the operation is having to borrow money to cover their other debt obligations.

4 Year Shock Cow-Calf and Diversified Farms

The cow-calf and diversified farms present a different picture, most likely because the current price for cattle is not significantly lower than the ten-year average price (Table 8). The low leverage farm had a high current ratio each year, but the medium and high never had a current ratio outside the high stress category (Table 9). Solvency improves for each leverage case. However, the high leverage farm ends the simulation still highly leveraged. The majority of the profitability measures are in the medium and low stress area. Debt repayment capacity is moderate in each leverage case except for the high leverage diversified farm.

Conclusions

From the simulations, we can see that price changes have a significant impact on the financial survival of a farm, especially when the amount of debt increases. It is also clear that where the operation is in their loan payoff plays a critical role. In this analysis, the operations that include livestock production are not as negatively affected by an increased debt load. This is most likely due to a combination of solid cattle prices and the increased asset value on the balance sheet. On the diversified farms, high cattle prices compensated for lower crop prices.

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Tables

Table 1. Base Scenario Crop Farm

Yr		1	2	3	4	5	6	7	8	9	10
Low Leverage	Current Ratio	0.3	2.4	6.5	10.4	3.7	3.8	2.7	2.3	1.9	86762.7
	D/A Ratio	15.8%	4.7%	3.1%	1.6%	36.6%	32.3%	26.7%	19.6%	10.8%	0.0%
	Rate of Return on Equity	4.0%	10.0%	5.8%	6.5%	3.5%	2.7%	3.9%	5.0%	5.9%	6.8%
	Term Debt Coverage Ratio	0.56	7.56	4.90	4.99	5.00	0.66	0.67	0.67	0.67	0.67
Medium Leverage	Current Ratio	0.2	0.2	0.2	0.3	0.9	1.2	0.7	0.4	0.3	0.3
	D/A Ratio	47.7%	44.4%	40.2%	34.9%	59.0%	48.0%	42.5%	36.8%	31.8%	25.8%
	Rate of Return on Equity	5.3%	6.7%	8.1%	9.4%	4.8%	19.8%	5.3%	6.8%	7.9%	8.8%
	Term Debt Coverage Ratio	0.55	0.52	4.28	4.59	4.76	1.27	0.58	0.58	0.56	0.53
High Leverage	Current Ratio	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1
	D/A Ratio	89.4%	89.9%	89.8%	88.9%	98.4%	100.9%	103.0%	104.6%	105.6%	106.0%
	Rate of Return on Equity	14.6%	24.6%	34.4%	41.7%	19.5%	221.3%	n/a	n/a	n/a	n/a
	Term Debt Coverage Ratio	0.54	0.51	0.49	0.46	3.46	0.50	0.48	0.45	0.42	0.39

Table 2. Base Scenario Cow-Calf Farm

Yr		1	2	3	4	5	6	7	8	9	10
Low Leverage	Current Ratio	1.2	3.4	3.9	4.4	9.9	11.3	12.4	13.4	14.3	n/a
	D/A Ratio	14.0%	5.7%	3.8%	1.9%	5.0%	4.0%	3.0%	2.0%	1.0%	0.0%
	Rate of Return on Equity	1.9%	9.7%	7.7%	7.6%	7.0%	6.7%	6.6%	6.6%	6.5%	6.4%
	Term Debt Coverage Ratio	0.06	0.98	2.70	2.76	2.77	4.33	4.38	4.38	4.38	4.38
Medium Leverage	Current Ratio	0.7	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	D/A Ratio	42.3%	38.0%	35.8%	33.6%	34.7%	31.2%	29.3%	27.4%	25.5%	23.5%
	Rate of Return on Equity	2.2%	10.3%	10.2%	10.0%	9.1%	11.1%	8.5%	8.3%	8.2%	8.1%
	Term Debt Coverage Ratio	0.12	0.62	0.65	0.62	2.29	2.00	1.45	1.43	1.41	1.40
High Leverage	Current Ratio	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	D/A Ratio	71.2%	70.0%	68.8%	67.5%	68.0%	67.2%	66.3%	65.3%	64.4%	63.5%
	Rate of Return on Equity	2.6%	17.2%	16.7%	16.2%	14.4%	13.6%	13.4%	13.2%	12.9%	12.6%
	Term Debt Coverage Ratio	0.18	0.61	0.57	0.54	0.59	0.47	0.43	1.03	1.04	1.00

Table 3. Base Scenario Diversified Farm

Years		1	2	3	4	5	6	7	8	9	10
Low Leverage	Current Ratio	1.2	2.1	2.7	3.3	4.8	5.2	5.5	5.9	6.2	23.9
	D/A Ratio	15.0%	7.9%	5.6%	3.3%	11.6%	9.5%	7.4%	5.2%	3.0%	0.9%
	Rate of Return on Equity	2.6%	6.4%	6.6%	6.5%	5.6%	5.3%	5.4%	5.5%	5.5%	5.5%
	Term Debt Coverage Ratio	0.48	0.75	2.49	2.52	2.52	2.19	2.19	2.19	2.19	2.19
Medium Leverage	Current Ratio	0.6	0.3	0.2	0.3	0.4	0.3	0.3	0.3	0.2	0.3
	D/A Ratio	41.5%	36.8%	33.4%	29.7%	33.5%	30.2%	26.9%	23.4%	19.8%	16.1%
	Rate of Return on Equity	2.9%	8.2%	8.4%	8.4%	7.2%	7.0%	7.1%	7.2%	7.2%	7.2%
	Term Debt Coverage Ratio	0.38	0.70	1.01	1.00	2.33	1.13	1.13	1.12	1.11	1.10
High Leverage	Current Ratio	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	D/A Ratio	70.8%	68.8%	66.6%	64.3%	66.5%	64.8%	63.0%	61.0%	58.8%	56.6%
	Rate of Return on Equity	3.7%	13.2%	13.1%	12.9%	10.6%	10.2%	10.4%	10.4%	10.4%	10.3%
	Term Debt Coverage Ratio	0.41	0.69	0.66	0.63	0.92	0.62	0.59	0.91	0.91	0.89

Table 4. Crop Farm 2 Year Shock Scenario

Yr		1	2	3	4	5	6	7	8	9	10
Low Leverage	Current Ratio	0.2	0.2	0.3	0.4	1.8	1.3	0.9	0.5	0.3	0.6
	D/A Ratio	23.9%	22.5%	16.6%	9.5%	42.2%	37.6%	31.5%	23.6%	15.3%	7.6%
	Rate of Return on Equity	-6.0%	0.2%	6.1%	7.1%	3.8%	3.4%	4.9%	6.1%	7.2%	8.0%
	Term Debt Coverage Ratio	-0.08	1.93	4.38	4.55	4.72	0.66	0.66	0.65	0.64	0.63
Medium Leverage	Current Ratio	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1
	D/A Ratio	55.7%	61.9%	59.6%	56.4%	71.5%	63.1%	62.0%	60.3%	57.8%	54.7%
	Rate of Return on Equity	-10.8%	-12.2%	9.6%	11.6%	4.8%	29.3%	6.0%	8.0%	9.8%	11.2%
	Term Debt Coverage Ratio	-0.10	-0.15	3.74	4.00	4.15	1.23	0.52	0.50	0.47	0.44
High Leverage	Current Ratio	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	D/A Ratio	97.8%	108.1%	110.0%	111.3%	116.3%	121.0%	125.5%	129.6%	133.4%	136.8%
	Rate of Return on Equity	-90.2%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Term Debt Coverage Ratio	-0.11	-0.16	0.42	0.39	2.91	0.43	0.40	0.37	0.34	0.30

Table 5. Cow-Calf Farm 2 Year Shock Scenario

Yr		1	2	3	4	5	6	7	8	9	10
Low Leverage	Current Ratio	1.2	3.0	3.5	3.9	9.1	10.5	11.6	12.7	13.6	n/a
	D/A Ratio	14.1%	5.8%	3.8%	1.9%	5.0%	4.0%	3.0%	2.0%	1.0%	0.0%
	Rate of Return on Equity	1.3%	9.4%	7.8%	7.6%	7.1%	6.8%	6.7%	6.6%	6.5%	6.4%
	Term Debt Coverage Ratio	0.00	0.94	2.69	2.75	2.76	4.33	4.38	4.38	4.38	4.38
Medium Leverage	Current Ratio	0.7	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
	D/A Ratio	42.6%	38.8%	36.7%	34.5%	35.6%	32.1%	30.3%	28.4%	26.5%	24.6%
	Rate of Return on Equity	1.3%	9.9%	10.3%	10.1%	9.2%	11.2%	8.5%	8.4%	8.3%	8.1%
	Term Debt Coverage Ratio	0.06	0.59	0.65	0.62	2.27	1.98	1.43	1.41	1.40	1.38
High Leverage	Current Ratio	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	D/A Ratio	71.8%	70.8%	69.6%	68.4%	68.9%	68.1%	67.2%	66.4%	65.5%	64.5%
	Rate of Return on Equity	0.8%	16.6%	17.0%	16.6%	14.6%	13.8%	13.7%	13.4%	13.1%	12.8%
	Term Debt Coverage Ratio	0.12	0.58	0.57	0.53	0.58	0.46	0.42	1.01	1.02	0.98

Table 6. Diversified Farm 2 Year Shock Scenario

Years		1	2	3	4	5	6	7	8	9	10
Low Leverage	Current Ratio	1.0	0.9	1.5	2.1	3.6	4.0	4.4	4.8	5.2	20.2
	D/A Ratio	15.3%	8.2%	5.8%	3.4%	12.0%	9.8%	7.6%	5.4%	3.1%	0.9%
	Rate of Return on Equity	0.4%	4.6%	6.7%	6.7%	5.9%	5.5%	5.6%	5.7%	5.7%	5.7%
	Term Debt Coverage Ratio	0.16	0.52	2.45	2.51	2.52	2.19	2.19	2.19	2.19	2.19
Medium Leverage	Current Ratio	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2
	D/A Ratio	42.3%	40.7%	37.5%	34.1%	37.6%	34.7%	31.7%	28.4%	25.1%	21.6%
	Rate of Return on Equity	-0.4%	5.4%	8.6%	8.6%	7.4%	7.2%	7.3%	7.3%	7.4%	7.3%
	Term Debt Coverage Ratio	0.14	0.47	0.98	0.97	2.24	1.09	1.08	1.07	1.06	1.05
High Leverage	Current Ratio	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	D/A Ratio	72.7%	72.7%	70.8%	68.7%	70.8%	69.3%	67.7%	66.0%	64.1%	62.1%
	Rate of Return on Equity	-3.2%	7.5%	14.3%	14.1%	11.4%	11.0%	11.2%	11.3%	11.2%	11.1%
	Term Debt Coverage Ratio	0.18	0.46	0.64	0.61	0.88	0.59	0.56	0.87	0.86	0.84

Table 7. Crop Farm 4 Year Shock Scenario

Yr		1	2	3	4	5	6	7	8	9	10
Low Leverage	Current Ratio	0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.1	0.1	0.1
	D/A Ratio	23.9 %	22.5%	25.9%	29.6%	51.1%	49.4%	46.9%	43.6%	39.5%	34.4%
	Rate of Return on Equity	-6.0%	0.2%	-5.4%	-5.3%	3.5%	3.6%	5.3%	6.8%	8.1%	9.2%
	Term Debt Coverage Ratio	-0.08	1.93	-1.07	-1.18	4.17	0.62	0.60	0.58	0.56	0.54
Medium Leverage	Current Ratio	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	D/A Ratio	55.7%	61.9%	68.6%	75.9%	87.3%	80.8%	81.7%	82.2%	82.2%	81.7%
	Rate of Return on Equity	-10.8%	-12.2%	-14.3%	-17.5%	4.8%	54.9%	7.2%	11.7%	16.2%	20.2%
	Term Debt Coverage Ratio	-0.10	-0.15	-1.55	-1.73	3.59	1.16	0.45	0.42	0.39	0.36
High Leverage	Current Ratio	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	D/A Ratio	97.8%	108.1%	119.3%	131.5%	132.5%	139.1%	145.7%	152.1%	158.4%	164.6%
	Rate of Return on Equity	-90.2%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Term Debt Coverage Ratio	-0.11	-0.16	-0.21	-0.27	2.41	0.36	0.33	0.29	0.26	0.22

Table 8. Cow-Calf Farm 4 Year Shock Scenario

Yr		1	2	3	4	5	6	7	8	9	10
Low Leverage	Current Ratio	1.2	3.0	3.3	3.6	8.6	10.0	11.2	12.2	13.1	n/a
	D/A Ratio	14.1%	5.8%	3.8%	1.9%	5.0%	4.0%	3.0%	2.0%	1.0%	0.0%
	Rate of Return on Equity	1.3%	9.4 %	7.5%	7.4%	7.1%	6.8%	6.7%	6.6%	6.5%	6.4%
	Term Debt Coverage Ratio	0.00	0.94	2.56	2.61	2.76	4.33	4.38	4.38	4.38	4.38
Medium Leverage	Current Ratio	0.7	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
	D/A Ratio	42.6%	38.8%	37.0%	35.1%	36.1%	32.7%	30.9%	29.0%	27.1%	25.3%
	Rate of Return on Equity	1.3%	9.9%	9.9%	9.7%	9.2%	11.2%	8.5%	8.4%	8.3%	8.1%
	Term Debt Coverage Ratio	0.06	0.59	0.61	0.58	2.25	1.98	1.42	1.41	1.39	1.37
High Leverage	Current Ratio	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	D/A Ratio	71.8%	70.8%	69.9%	68.9%	69.4%	68.7%	67.8%	67.0%	66.1%	65.2%
	Rate of Return on Equity	0.8%	16.6%	16.2%	15.9%	14.8%	14.0%	13.8%	13.6%	13.3%	13.0%
	Term Debt Coverage Ratio	0.12	0.58	0.54	0.50	0.58	0.46	0.42	1.00	1.01	0.97

Table 9. Diversified Farm 4 Year Shock Scenario

Years		1	2	3	4	5	6	7	8	9	10
Low Leverage	Current Ratio	1.0	0.9	1.0	1.1	2.5	3.0	3.4	3.8	4.2	16.6
	D/A Ratio	15.3%	8.2%	5.9%	3.5%	12.4%	10.1%	7.9%	5.6%	3.2%	0.9%
	Rate of Return on Equity	0.4%	4.6%	4.8%	4.9%	6.0%	5.7%	5.8%	5.8%	5.9%	5.8%
	Term Debt Coverage Ratio	0.16	0.52	1.71	1.73	2.48	2.19	2.19	2.19	2.19	2.19
Medium Leverage	Current Ratio	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1
	D/A Ratio	42.3%	40.7%	39.4%	38.0%	41.4%	38.7%	35.8%	32.8%	29.6%	26.4%
	Rate of Return on Equity	-0.4%	5.4%	5.6%	5.8%	7.5%	7.3%	7.4%	7.5%	7.5%	7.5%
	Term Debt Coverage Ratio	0.14	0.47	0.66	0.63	2.17	1.05	1.04	1.03	1.02	1.00
High Leverage	Current Ratio	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	D/A Ratio	72.7%	72.7%	72.6%	72.5%	74.5%	73.2%	71.8%	70.3%	68.6%	66.8%
	Rate of Return on Equity	-3.2%	7.5%	8.0%	8.4%	12.3%	11.8%	12.1%	12.2%	12.1%	11.9%
	Term Debt Coverage Ratio	0.18	0.46	0.43	0.38	0.85	0.57	0.54	0.83	0.82	0.79