

Financial Impacts from Farmland Value Declines by Various Farm Ownership Levels (AEC 2013-05)

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Long-term farm financial strength stemming from investment decisions is a primary concern of all producers, bankers, and the entire agricultural industry. Farmland in Kentucky represents the primary resource for producers to accumulate wealth and represents, on average, 75% of producers' assets (KFBM, 2012). There are large differences in farmland as a percent of assets across Kentucky producers, with a minimum of 13% and maximum of 99% (KFBM, 2012). Declines in farmland values have the potential to reduce long-term farm financial strength (causing liquidation in the extreme case) as well as producing negative indirect impacts throughout the entire agricultural industry. In this article, we examine farm financial impacts from farmland value declines by various farmland ownership levels through key financial ratios.

Producers rely on banks for access to credit. In order for banks to grant access to credit they require key financial ratios to be below predetermined thresholds. Certain key financial ratios that help gauge producer solvency, such as debt to total asset and debt to equity ratios, depend heavily on farm assets and therefore, farmland values. For example, the debt to total asset ratio depends heavily on the

denominator, which includes farmland values, box 1. A decline in asset values while holding debt constant results in a higher debt to total asset ratio. The resulting higher debt to total asset ratio is that much closer to banks predetermined thresholds where credit access could be declined.

BOX 1

Debt to Total Assets Ratio:

$$\frac{\text{Total Debt}}{\text{Total Assets}} \times 100 = \%$$

- Calculated by taking the amount of total debt outstanding and dividing it by the amount of total assets multiplied by 100 to put it into percentage terms.
- Debt to total assets is strong with a value less than 30% and weak with a value greater than 70%.
- For example, a debt to total assets ratio of 30% can be interpreted by stating that a producer has \$0.30 of debt for every \$1.00 in assets.

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Impacts on producers from declines in farmland values will not be symmetric across producers and will depend on two factors. The first factor is the percent of total wealth invested in farmland. For example, producers who own no farmland will face no change in their financial ratios from farmland value declines whereas producers who own almost all their farmland will observe a direct adverse effect on their financial solvency ratios. The second factor is the starting level of the main financial ratios. Increases in key financial ratios will not cause any adverse impacts if the financial ratios started well below predetermined thresholds. Starting with strong financial ratios increases the chances of success versus starting with poor financial ratios, which are already closer to bank thresholds.

Financial Ratios

Two leading financial ratios that demonstrate financial health are the debt to total assets ratio (Box 1) and the debt to equity ratio (Box 2). The debt to asset ratio is calculated by dividing total outstanding debt by total assets and multiplying it by 100 to turn it into a percentage. In the denominator of the debt to asset ratio is total assets, representing available resources to pay off debt and farmland. Farmland value declines raise the debt to total assets ratio resulting in additional long-term financial risk. As a general rule of thumb, a debt to asset ratio of 30% or less is strong because the debt financing is managed substantially through producer equity. A debt to asset ratios greater than 70% is considered weak, indicating financing of assets primarily through debt.

The debt to equity ratio indicates a business's ability to pay debts. The debt to equity ratio is calculated by dividing total outstanding debt by total equity then multiplying it by 100 to turn into a percentage. Farmland value declines decreases equity, increasing long-term financial risk. The difference between strong and weak debt to equity ratios depend upon industry factors such as; industry scale, capitalization make up and market volatility. In agriculture, a debt to equity ratio is

BOX 2

$$\frac{\text{Total Debt}}{\text{Total Equity}} \times 100 = \%$$

- Estimated by dividing total debt by total equity multiplied by 100 to put into percentage terms.
- Debt to Total Equity is strong with a value less than 42% and weak with a value greater than 230%.
- Example, a debt to equity ratio of 13.20% can be interpreted by stating that a producer has \$0.13 of debt for every \$1.0 in equity.

strong when below 42%, indicates financing of growth through debt and weak with a value greater than 230%, indicating growth with debt (Kohl 2009).

Data

We use Kentucky Farm Business Management Program (KFBM) farm financial data to analyze farm financial impacts from farmland value declines. The KFBM data provide over two thousand observations from 1998 to 2009 of producer-level balance sheet data and farm demographic information (i.e., Owned acres, farm acres, crops grown). We supplement KFBM data with Kentucky farmland value per acre data from the National Agricultural Statistics Service (NASS).

KFBM farm business summary statistics indicate that farmland represents on average 75% of producers' assets (Table 1). Debt to total assets ratio averaged 8.7%, indicating that there is \$0.09 worth of debt for every dollar of assets. Variation in debt to asset ratio ranged from zero or no debt to 75%, indicating the financing of assets through debt. The debt to equity ratio averaged 10.6%, implying about \$0.11 debt for every dollar worth of assets. The debt to equity ratio varied from a low of zero or no debt to a high value of 316%, indicating, in this case, the financing of growth substantially with debt.

Table 1. Summary of Kentucky Farm Business Management Data, 1998 to 2009, in percent.

	Mean	Standard deviation	Min	Max
Farmland as a % of total assets	75.0	13.0	19.2	99.5
debt to total assets	8.7	8.5	0.0	75.1
debt to equity	10.6	12.9	0.0	316.5

Notes: 1003 observations, years 2005-2009

Analysis

To assess farm financial health caused from declines in farmland values we look at five different categories of percent farmland ownership to total acres farmed. The five categories are the largest 10% farmland ownership group, largest 3rd, middle 3rd (median), smallest 3rd, and smallest 10 percent. The middle 3rd farmland ownership group has 75% of their assets invested farmland, where

the largest 10% farmland ownership group has 84% (Table 2). Finally, the smallest farmland ownership group has 53% of their assets invested in farmland.

To identify farm financial impacts from farmland value declines we reduce farmland values by 15% and 30% and re-calculate both financial ratios. The 15% decline represents one the largest historical year-to-year farmland value changes. The 30% decline is double the 15% decline to represent a rare event twice as large ever witnessed. Producers with a larger share of total assets invested in farmland represent the ownership group with the greatest amount of money to lose from declines in farmland values. For the largest ownership group a farmland value decline of 15% results in over a 12% capital loss, while the smallest farmland ownership group loses nearly 8% worth of capital (Table 2). While both losses are high, impacts on the farm are quite different. Diversified farms or those who have assets in other investments see a smaller impact than farms with assets primarily found in farmland.

Table 2. Farmland as a Percentage of Total Assets with Simulated Farmland Value Declines*

Farmland Ownership Group	Farmland Value	Farmland Value Decline			
		15% Decline		30% Decline	
		New Farmland Value	Difference	New Farmland Value	Difference
Smallest 10%	53.0	45.0	-7.9	37.1	-15.9
Smallest 3 rd	60.6	51.5	-9.1	42.4	-18.2
Middle 3 rd	74.8	63.5	-11.2	52.3	-22.4
Largest 3 rd	80.2	68.2	-12.0	56.2	-24.1
Largest 10%	83.6	71.1	-12.5	58.5	-25.1

* Average value. Years 2005-2009. Values are in percent.

Results indicate that debt to asset ratios across all farmland ownership sizes is currently displaying strong long-term financial solvency (Table 3). In the extremes of farmland ownership categories, debt to asset ratios ranged from a high of just over 18% in the smallest ownership group to 5% for the largest ownership group. Financially, the group with the highest debt to asset ratio, the

smallest ownership group would be the most concerned about increases in debt to asset ratio above acceptable bank levels.

A 15% decline in farmland values increases the smallest farmland ownership group's debt to asset ratio by almost 8% to just less than 20% (table 3). A 30% farmland value decline increases their debt to asset ratio to over 21%. For the largest farmland ownership group, the 15% farmland value decreases result in their debt to asset ratio increasing by over 12% for a new ratio of just less than 6%. The smallest farmland ownership group has the highest debt to asset ratio but also has the lowest percent assets invested in farmland. As a result, changes in farmland values will not affect them as strongly as producers with a higher percentage of assets in farmland. The smallest farmland ownership group realizes 53% of each dollar of farmland value decline on their financial ratios. The largest farmland ownership group realizes 82.6% of each dollar of farmland value decline. The debt to asset ratio for the largest ownership group was so low to begin with that it does not raise enough to be near any financial concern levels. Farmland value declines of up to 30% do not leave any farm ownership groups with weak debt to asset ratios, indicating strong solvency.

Table 3. Debt to Asset Ratio from Declines in Farmland Values*

Farmland Ownership Group	Debt to Asset	Farmland Value Decline			
		15% Decline		30% Decline	
		New Debt to Asset	% Change	New Debt to Asset	% Change
Smallest 10%	18.3	19.7	7.9	21.2	15.9
Smallest 3 rd	14.5	15.8	9.1	17.1	18.2
Middle 3 rd	10.7	11.9	11.2	13.1	22.4
Largest 3 rd	7.2	8.0	12.0	8.9	24.1
Largest 10%	5.2	5.8	12.5	6.4	25.1

* Values are in percent.

Across all farmland ownership groups, the debt to equity ratios displays strong long-term financial condition (Table 4). For the smallest farmland ownership group, the debt to equity ratio comes in over 26%, and for the largest farmland ownership group the debt to equity ratio comes in at over 5%. As we found in debt to asset ratio analysis, the group with the highest debt to equity ratio is the smallest farmland ownership group. A 15% farmland value decline increases the debt to equity

ratio by just fewer than 8% to just over 28%. A 30% farmland value decline increases the debt to equity ratio by just fewer than 16% to slightly over 30%. For the largest farmland ownership group, the average debt to equity ratio is surprisingly low, coming in at less than 6%. With more assets invested in farmland, a 15% decline in farmland values impacts them by just over 12% to a new debt to equity ratio of just over 6%. For a 30% decline, the debt to equity ratio increases to just fewer than 7%. Large declines in farmland values do not put any ownership group in a weak debt to equity ratio condition.

Table 4. Debt to Total Equity Ratio from Declines in Farmland Values*

Farmland Ownership Group	Debt to Equity	Farmland Value Decline			
		15%		30%	
		New Debt to Equity	% Change	New Debt to Equity	% Change
Smallest 10%	26.1	28.2	7.9	30.3	15.9
Smallest 3 rd	21.0	22.9	9.1	24.8	18.2
Middle 3 rd	12.5	13.9	11.2	15.4	22.4
Largest 3 rd	8.2	9.2	12.0	10.2	24.1
Largest 10%	5.5	6.2	12.5	6.9	25.1

* Values are in percent.

Using these two financial ratios we found no evidence that producers would find credit inaccessible due to farmland values declines up to 30%. This result comes with a few caveats. First, results assume all other assets remain equal in value. Declines in farmland could also be positively correlated with equipment values. Second, banks also depend on other financial measures such as current ratio and past repayment history to evaluate credit worthiness. Third, declines in farmland values could continue for a long time, resulting in multiple double digit farmland value declines that could lead financial ratios to levels where producers may find it difficult to obtain credit.

While financial ratios are quite prominent in accessing credit, producers are still concerned about capital losses associated with farmland value declines. KFBM producers as a group carry about \$1.2 billion worth of assets in farmland (Table 5). Capital losses of nearly 200 million dollars results from a 15% farmland value decline for KFBM producers. This amount varies among producer ownership with producers in the largest farmland ownership group losing around 120 million dollars. Producers in

the smallest farmland ownership group lose around 17 million dollars. Farmland as a higher percentage of assets results in larger capital losses due to declines in farmland values.

Table 5. Capital Levels from Declines in Farmland Values

Farmland Ownership Group	2009 level	Farmland Value Decline	
		15 (%) Value Loss	30 (%) Value Loss
Smallest 3 rd	\$119,349,450	\$17,902,417	\$35,804,835
Middle 3 rd	\$334,949,100	\$50,242,365	\$100,484,730
Largest 3 rd	\$804,870,500	\$120,730,575	\$241,461,150
Total	\$1,259,169,050	\$188,875,357	\$377,750,715

Conclusion

We analyze producer ability to withstand farmland value declines at different farmland ownership levels. Data indicates a strong financial position currently exists in both the debt to asset ratio and debt to equity ratio for all farmland ownership sizes. Results indicate that after shocking both financial ratios with a 15% and 30% farmland value decline all farmland ownership levels remain in a strong financial position.

Declines in farmland values still result in loss of capital. A 15% decline in farmland values results in nearly a \$200 million capital loss for Kentucky KFBM participants. A 30% decline results in nearly a \$400 million capital loss. The financial impact on the farm depends on the percentage of assets in farmland. We found that for the smallest farmland ownership group the debt to asset ratio increases by 8.6% from a 15% farmland value decline. For the largest farmland ownership group, the debt to asset ratio increases by 14.3%. Diversification of assets into other investments provides protection against declines in one asset; farmland in this example. Furthermore, diversification of assets into an asset classes that grow as farmland values declines provides a farmland value hedge. Currently, no hedging mechanism of this type exists. Financial innovation through the creation of Exchange Traded Funds (ETFs) could provide an approach in which producers could invest in assets that grow as farmland values decline. Future articles will discuss how ETFs can help achieve this.

References

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