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Financial Characteristics of North Dakota Farms 2007-2016

Andrew L. Swenson

Department of Agribusiness and Applied Economics
Agricultural Experiment Station
North Dakota State University
Fargo, ND 58108-6050

Contact Information

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Abstract

The performance of over 500 North Dakota farms, 2007-2016, is summarized using 16 financial measures. Farms are categorized by geographic region, farm type, farm size, gross cash sales, farm tenure, net farm income, debt-to-asset, and age of farmer to analyze relationships between financial performance and farm characteristics. Five-year averages, 2011-2015, are also presented. In 2016, median and average acreage per farm was 1,779 and 2,365, respectively. Median and average cash farm revenue was $535,952 and $704,566, respectively. About 75% of farms were crop farms and median age of farm operators was 48.

Median net farm income in 2016 increased to $82,178 from $18,982 in 2015, which was the lowest since 1997. The 10-year high was $238,054 in 2012. Financial measures for 2012, 2011, 2010, 2008 and 2007 were much superior to those in other years for the 2007-2016 period. The Red River Valley and crop farms typically had stronger profitability, solvency, and repayment capacity than other regions and farm types, respectively, but not in 2013 and 2014. Median net farm income of livestock farms decreased to $2,864 in 2016 from a ten year high of $95,130 in 2014.

Farms with sales less than $500,000 were nearly twice as likely to have debt-to-asset higher than 70 percent as farms with sales greater than $500,000. Farms that own some crop land, but less than 40 percent of the land they operate were more likely to be crop farms, farm more acreage, have larger sales, and be more profitable. As expected, solvency and percent of crop land owned increased with farmer age. Median net farm income as a percent of gross revenue was the lowest in the decade in 2015, at 5.1%, and the highest in 2012, at 36.8%.

Keywords: Farm financial management, farm management, farm income, liquidity, solvency, profitability, repayment capacity, financial efficiency, financial benchmarks, tenure, North Dakota.

Introduction

Financial statements such as the balance sheet and income statement provide a structured format to summarize financial information so it is more manageable for decision making. It is helpful to further simplify or summarize information contained in financial statements into key measures of financial performance. However, the calculation of a financial measure can be fruitless unless there is a meaningful basis of comparison to evaluate the number. Two methods of comparison are:

1. **Past performance**. The progress of a business can be monitored by constructing financial measures on a periodic basis and comparing present to past performance.

2. **Industry benchmarks**. The average or median of a financial measure from several similar businesses provides a good point of reference. There are statewide farm record programs in some states, including North Dakota. Each farm has its own unique aspects, so the most appropriate comparison would be farms that have similar enterprises and resources.

Whatever method of comparison is used, it is imperative that the procedures for construction of financial statements and performance measures are consistent over time and between farms to ensure an "apples-to-apples" comparison.

The Farm Financial Standards Task Force (FFSTF), which was formed by the American Bankers Association in 1989, has provided recommendations of standards for financial statement construction and the calculation measures of financial performance. Sixteen of these measures are the basis for the benchmarks presented in this publication. The Appendix has an explanation of the financial measures used in this study.

The purpose of this study is to provide information to producers, lenders, educators, and others on the financial performance of a sample of North Dakota farms. Table 1 lists the median operator age, farm size and selected financial factors, 2007-2016. The data are from financial summaries of farms participating in the North Dakota Farm Business Management Education program. In this study, the median and upper and lower quartiles of 16 financial performance measures are presented for all farms in the data set and for groupings of farms by characteristic such as farm type, farm size, and age of producer. The results can be used by producers and lenders to evaluate the financial performance of a farm. Also, trends can be identified and relationships between farm characteristics and financial measures can be analyzed. However because of the small number of farms in this study, the results should be used cautiously and only be considered guidelines.

Source of Data

About 700 farms are enrolled in the North Dakota Farm Business Management Education program. Instructors educate and assist producers in record keeping and review data for completeness and accuracy. Instructors use the Finpack farm financial management software program to generate financial summaries. From 2007-2016, the financial summaries of over 500 farms each year were considered usable for this study.

About 85 percent of the total farms repeat from one year to the next. Annual turnover occurs from changes in farm management program enrollment and the level of farms completing their records by a cutoff date.

The farms in this study are larger and the age of the farm operators younger than the state average. In 2016, there were 29,800 farms in North Dakota with agricultural production of at least $1,000. Only 10,500, or 35%, had gross receipts greater than $250,000, whereas 75% of the 531 farms in 2016 for this study exceed that sales volume (median gross sales was $535,952). The farms in the study are more representative of operations that provide the primary source of net family income. The average age of farm operators in this study is 46 compared to 57 for the state average.

Interpretation of Results

Each financial measure was calculated for each farm. Refer to the Appendix for definitions of the financial measures and an explanation of asset valuation and accrual adjustments.

Farms were grouped by characteristics such as region, type of farm, and size and were sorted in order from strongest to weakest by each of the 16 financial measures. The **median** is the midpoint value of the financial measure: one-half of the farms in the category had a higher value and one-half had a lower value than the median. The **upper quartile** is the value that was exceeded by one-fourth of the farms, and the **lower quartile** is the value that was exceeded by three-fourths of the farms. (Another definition of lower quartile is the value for which one-quarter of the farms in the category had a weaker value.)

Individual farm operators and lenders can use this study for benchmarks of comparison if their financial measures are calculated similarly. For example, a farm operator 30 years of age may compare his/her profitability and financial efficiency with those of other young operators. Or, a lender may compare the solvency and repayment capacity of producers who rent all their crop land. This study also can be used to look at relationships and trends. What is the relationship between age of farmer and rate of return on equity? How has operating profit margin of livestock farms changed over time?

One ratio is not sufficient to make conclusions about the overall financial performance of a farm business. For example, a crop farm may have a debt-to-asset ratio of 50%, which is worse than the median value of 42.7% (shown on table 6) for the crop farm enterprise category. However, other factors such as profitability, total assets, and age of operator should also be considered.

Also, a farm can be adversely affected by extraordinary circumstances. Profitability in the low quartile may not be reflective of management capability if the farm had localized bad weather that was not experienced by many other producers in the farm category.

Caution must be used when analyzing the tables because a small number of farms increases the possibility that results may not be representative of a farm category. In this study for 2016, there are only 49 mixed livestock-crop enterprise farms, 78 farms in the west region, 83 farms with operators 40 to 50 years of age, 86 livestock farms, and 89 farms with net farm income of $50,000 to $100,000.

Performance of the Red River Valley region may not be representative of the central or northern areas of the Red River Valley because nearly all valley farms in the study are from the south. Also, there was a lack of farms in the northern portion of the west region. Lastly, the livestock farm type is dominated by the beef cow-calf enterprise.

There are some strong correlations between two or more classifications, so it is difficult to associate a financial measure with an individual farm characteristic. For example, the profitability of livestock, in comparison to crop farming, is reflected in farm categories that had a disproportionate number of livestock farms, such as the west region, farms with less than $250,000 sales, and farms with greater than 70% debt-to-asset. Also, comparison of farms by enterprise type, farm size and gross sales can be affected by regional performance. The Red River Valley has the highest proportion, relative to other regions, of crop farms, farms of less than 2,000 acres, and farms with gross income greater than $500,000.

Table 1 shows the 10-year trends in financial performance and farm characteristics. Table 2 lists the farm characteristics and percentage distribution for 2016 and the breakout of these characteristics by region of North Dakota. Tables 3 through 11 display the median and quartiles of 16 financial measures by farm characteristics. Figures 1 through 16 display relationships between selected farm characteristics and financial measures. A summary of highlights by farm characteristics is also presented.

TABLE 1. Median Farn Size, Farm Operator Age, and Financial Factors of Farms Participating in the North Dakota Farm Business Management Education Progra, 2007-2016.

	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Number of Farms	531	525	518	527	537	551	543	537	532	531
	---------- Median----------									
Age of Operator	48	48	48	48	47	48	47	47	47	47
Farm Size (acres)	1,779	1,847	1,847	1,865	1,932	1,968	2,010	1,995	2,001	2,000
Gross Cash Revenue	535,952	499,756	531,374	606,730	585,143	569,268	469,023	430,321	464,464	353,252
Total Farm Assets	1,504,664	1,482,932	1,614,430	1,497,426	1,463,890	1,171,781	1,124,263	1,019,147	995,609	810,426
Total Farm Liabilities	570,457	603,538	622,633	514,407	500,161	442,159	441,482	444,169	419,979	371,180
Current Ratio	1.5	1.3	1.6	1.9	2.3	2.0	1.9	1.4	1.8	1.7
Working Capital	108,748	61,285	117,283	139,950	256,110	157,751	151,933	72,683	128,854	103,063
Debt-to-Asset (%)	45.9	46.5	44.7	41.8	40.6	43.7	46.7	51.2	48.4	50.0
Rate of Return on Farm Assets (%)	4.8	0.4	2.8	4.7	16.2	10.5	14.9	4.0	10.6	15.7
Rate of Return on Farm Equity (%)	5.3	-1.6	2.1	5.3	24.8	15.4	23.6	3.0	15.8	25.3
Operating Profit Margin (%)	14.1	1.3	8.8	13.6	32.4	24.0	29.8	9.7	20.8	29.3
Net Farm Income	82,178	18,982	54,543	90,629	238,054	144,414	174,010	47,547	114,520	127,791
Term Debt Coverage Ratio	1.68	0.69	1.08	1.50	4.64	2.86	3.7	1.2	2.7	3.3
Term Debt & Capital Repayment Margin ($)	35,318	-16,382	3,556	25,849	185,291	90,286	119,428	6,360	67,276	86,825
Asset Turnover Ratio	33	.30	.34	.35	.50	.45	.48	.40	.52	.56
Operating Expense Ratio (%)	69.2	80.2	75.2	71.5	55.4	62.7	57.5	75.6	66.9	58.2
Depreciation Expense Ratio (%)	7.8	8.8	7.3	5.9	4.2	4.8	4.2	5.2	4.1	4.3
Interest Expense Ratio (%)	4.0	4.3	3.5	3.5	2.8	3.4	3.7	4.9	4.4	5.2
Net Farm Income Ratio (%)	17.7	5.1	12.5	17.9	36.8	27.5	33.1	13.4	24.2	30.6

FARM CLASSIFICATION AND HIGHLIGHTS

ALL FARMS

Highlights

- From 2007 to 2016, farms enrolled in the North Dakota Farm Business Management Education Program have become larger as measured by median gross revenue, which has increased 52%, and by median farm assets and liabilities, which increased 86% and 54%, to $1,504,664 and $570,457, respectively.

- All 16 measures of financial performance improved in 2016 because of corn and soybean yields which were 20 and 14 percent higher, respectively, than previous record yields, lower production costs and strong government payments received for the 2015 crop year. A significant decline in financial performance occurred, 2013-2015, despite record wheat yields and beef prices, because of sharply lower grain prices. Median net farm income improved to $82,178 from $18,982 in 2015. It was $54,543, $90,629 and $238,054 in 2014, 2013 and 2012, respectively. Financial performance was the strongest in 2012 as record crop prices and strong yields more than offset an increase of costs.

- In 2011, below average yields and high costs were offset by high grain prices. Crop insurance indemnities were profitable on the nearly one-fourth of cropland prevented from planting. In 2010, corn and sugar beets were record yields and barley, canola, and spring wheat were second highest in history. Grain prices increased to very high levels and costs were flat to down. Federal disaster payments for the 2008 crop year were paid in 2010.

- In 2009, lower crop prices, high costs and low livestock profit resulted in sharply lower financial performance despite record yields for spring wheat, durum, barley, canola, and field peas. Financial performance in 2007 and 2008 was outstanding because of high crop prices.

- Median current ratio improved to 1.5 in 2016 from the 10-year low, 1.3, in 2015. It was highest, 2.3, in 2012, 2.0 in 2011, 1.9 in 2013 and 2010, 1.8 in 2008, 1.7 in 2007 and 1.6 in 2014. Median debt-to-asset was 45.9% in 2016, 46.5% in 2015, 44.7% in 2014 and 41.8% in 2013 compared to 40.6% in 2012, and 43.7% in 2011. It was 51.2% in 2009, 48.4% in 2008 and 50% in 2007.

- In 2016, median rates of return on assets and equity were 4.8% and 5.3%, respectively, compared to 2015, which were the lowest in the past ten years at 0.4% and -1.6%, respectively. In 2012, ROA of 16.2% and ROE of 24.8% were the highest. ROE was less than ROA, which indicated that debt capital was not employed profitably, in 2009, 2014, and 2015.

- The median term debt coverage ratio and term debt and capital repayment margin ranged from 0.69 and -$16,382, respectively, in 2015, to 4.64 and $185,291, respectively, in 2012. Median term debt coverage ratio was 1.68 in 2016.

- Interest expense as a percent of gross revenue was 4.0% in 2016 and 4.3% in 2015 compared to 3.5% in 2013 and 2014. It was 2.8% in 2012 after a general improvement since 2006 because of lower interest rates and stronger gross revenue.

- Median net farm income as a percent of gross revenue was 17.7% in 2016. It was the lowest of the ten-year period, 2007-2016, at 5.1% in 2015 compared to the highest 36.8% in 2012.

Table 2. Farm Classifications and Percent Distribution of Farm Types within Regions, North Dakota Farm Business Management Education Program, 2016.

Farm Category Group	Number of Farms (531)	Percentage	Farm Group Category Breakout by Region			
			Red River Valley	North Central	South Central	West
Region			117	178	158	78
Red River Valley	117	22				
North Central	178	34				
South Central	158	30				
West	78	15				
Farm Enterprise			----------percentage----------			
Crop	396	75	98	81	66	41
Livestock	86	16	1	12	19	42
Mixed	49	9	1	7	15	17
Farm Sales						
$249,999 or less	132	25	13	26	28	33
$250,000 - $499,999	120	23	23	21	23	24
$500,000 - $999,999	171	32	37	36	27	28
$1,000,000 or more	108	20	27	17	22	14
Farm Size						
1,999 acres or less	293	55	79	46	56	38
2,000 acres or more	238	45	21	54	44	62
Cropland Tenure						
Full tenant	146	27	32	28	28	24
1-20 percent owned	109	21	26	25	15	17
21-40 percent owned	111	21	23	21	20	22
41 percent or more owned	149	28	19	25	37	37
Farm Income						
$49,999 or less	206	39	36	32	39	59
$50,000 - $99,999	89	17	16	20	15	15
$100,000 - $199,999	129	24	32	26	21	17
$200,000 or more	107	20	16	22	26	9
Debt-to-asset Ratio						
0 – 40 percent	219	41	50	43	40	27
41 – 70 percent	207	39	44	35	40	38
71 percent or more	105	20	7	21	20	35
Farmer Age						
39 years or younger	197	37	32	40	35	41
40 – 49 years	83	16	16	18	15	10
50 years or older	251	47	51	42	49	49

Region

Farms are classified in one of four geographic regions in North Dakota, based on the location of their Farm Business Management program. However, farms enrolled in the Bismarck program are classified as "west or "south central" according to which side of the Missouri River the farm is located. Some farms enrolled in the Fargo and Wahpeton programs are not in the Red River Valley and are classified as south-central and some Langdon program farms are classified as Red River Valley. The southern area of the "west" region is better represented than the northern area. The northern area of the Red River Valley has little representation. Locations of North Dakota Farm Business Management programs that participated in the 2016 summaries are:

Red River Valley: Wahpeton and Fargo
North Central: Bottineau, Devils Lake, Langdon, Minot, and Rugby
South Central: Bismarck, Carrington, Jamestown, and Oakes
West: Bismarck, Dickinson, and Glen Ullin

Highlights

- In 2016, the median farm size increased from the Red River Valley (1,233 acres, all crop land) to the west region (2,607 acres, including pasture). Median farm size was 2,089 acres (1,861 crop acres) in the north central region and 1,763 acres (1,166 crop acres) for the south central region. The average size was larger: the Red River Valley, north central, south central and west regions were, 1,448, 2,419, 2,598, and 3,140 acres per farm, respectively.

- Several farm characteristics are strongly related to region. Red River Valley farms are more likely to be crop farms and typically have smaller total acreage (crop land and pasture) but larger total farm sales, assets, and liabilities than farms in other regions.

- Typically, the Red River Valley has the best financial performance, but in 2014 profit of its dominant enterprises, soybeans, corn and sugarbeets suffered and it had the lowest median net farm income, $3,921, of any region over the past 10 years. The west region had the lowest median net farm income in seven of the past 10 years.

- In 2016, the incidence of livestock and mixed enterprise farms ranged from only 2% in the Red River Valley to 59% in the west.

- The median net farm income in 2012 was the highest in the decade for all regions and 2014 was the only year it was higher in the west than other regions. From 2012 to 2015, it decreased about 90% in all regions. In 2016, it increased 201% to $98,221 in the Red River Valley, 688% to $95,890 in the north central region, 357% to $83,349 in the south central region, and 63% to $27,949 in the west.

- In 2016, the median current ratio was 1.7 in the Red River Valley and 1.6, 1.5 and 1.3 in the south central, north central and west regions, respectively. The five-year average, 2011-2015, median current ratio by region ranged from 1.6 in the west region to 2.3 in the Red River Valley.

- In 2012, median debt-to-asset for all regions were the best over the 2007 to 2016 period, ranging from 34.9% in the Red River Valley to 50.5% in the west. In 2016, it was 41.5% in the Red River Valley, 43.8% in the south central region, 45.8% in the north central region, and 59.4% in the west.

- In 2016, the median term debt coverage ratio increased in all regions. It was 2.03 in the south central and north central regions, 1.58 in the Red River Valley and 1.16 in the west region.

- The only year in which all regions had median operating expense (all expenses except depreciation and interest) as a percent of gross revenue greater than 75% was 2015. The only years any regions achieved less than 60% in the past 10 years were in 2012, 2010 and 2007. In 2016, it ranged from 67.3% in the north central region to 73.1% in the Red River Valley.

Farm Enterprise

Farms were classified as "crop" if 70% or more of total sales were from crops, and "livestock" if livestock sales accounted for 70% or more of total sales. The remaining farms were classified as "mixed". The "livestock" farm type is dominated by the beef cow-calf enterprise.

Highlights

- From 2007 to 2016, about 70 to 75% of all farms were classified as crop, compared to about 64% from 2002 to 2006.

- In 2016, 59% of farms were classified as livestock or mixed enterprise in the west region compared to 2% in the Red River Valley, 19% in the north central and 34% in the south central regions.

- The best performance, by farm type, for nearly every financial measure over the 2007-2016 period was achieved by crop farms in 2012. Livestock farms had their best financial performance relative to other farm types in 2014 because of record high beef cattle prices.

- Every year, 2007-2016, crop farms were larger than livestock and mixed enterprise farms in median total assets, total liabilities, and gross income. The only year in which median net farm income of both livestock and mixed enterprise farms exceeded that of crop farms was 2014.

- The highest median net farm income of any farm type over the 2007-2016 period was $328,695 in 2012 for crop farms and the lowest was $2,864 in 2016 for livestock farms. In 2016, median net farm income increased 427% to $109,408 for crop farms and 360% to $46,293 for mixed enterprise farms.

- Over the past term years, median rate of return on equity has ranged from 0% in 2014 to 29.6% in 2012 for crop farms compared to a range of -4.8 in 2016 to 22.8% in 2014 for livestock farms.

- In 2014, the median asset turnover ratio was 0.34 for all farm types. However, typically it is higher for crop farms. In 2016, it was 0.38 for crop farms, 0.28 for mixed enterprise farms, and 0.18 for livestock farms (predominantly beef cow-calf farms).

- In 2016, crop farms had a median term debt coverage ratio of 2.07, compared to 0.65 in 2015 and 5.60 in 2012. In 2016, it was 0.54 for livestock farms, and 0.89 for mixed enterprise farms.

- In 2016, median interest expense as a percent of gross revenue was 3.3% for crop farms, 8.3% for livestock farms and 5.3% for mixed enterprise farms. Each farm type had its best measure in 2012. Typically, 2007-2016, crop farms had a lower interest expense ratio than other farm types.

- Over the past ten years, the best performance in converting gross income into net income was 39.5% by crop farms in 2012 and 38.4% by livestock farms in 2014. Livestock farms had their ten-year low, 3.1%, in 2016 compared to 20.0% for crop farms.

Figure 1. Median Total Farm Assets and Liabilities by Farm Type, 2016, N.D. Farm Mgt. Program

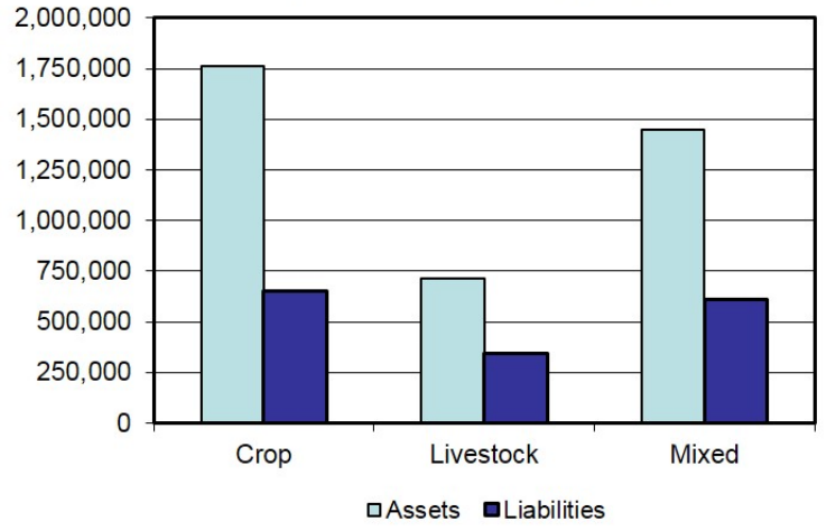


Figure 2. Median Net Farm Income by Farm Type, 2007-2016, N.D. Farm Mgt. Program

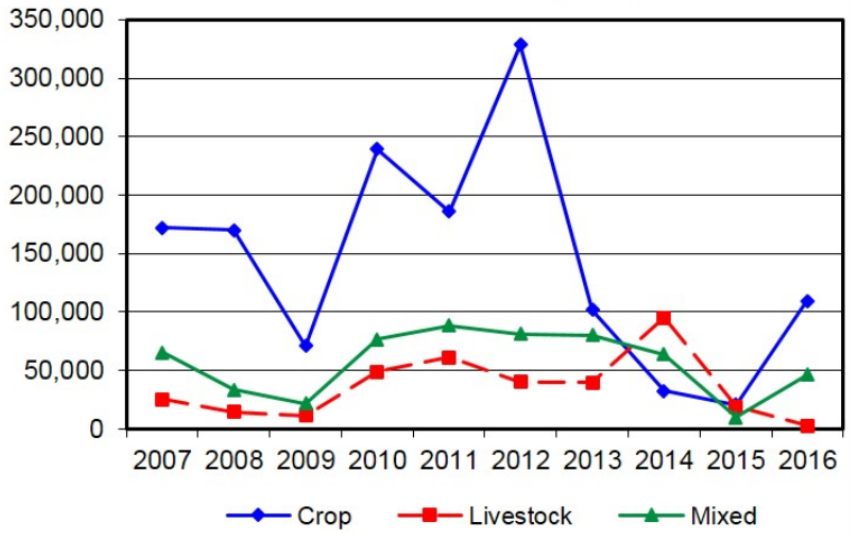


Figure 3. Median Rate of Return on Assets by Farm Type, 2007-2016, N.D. Farm Mgt. Program

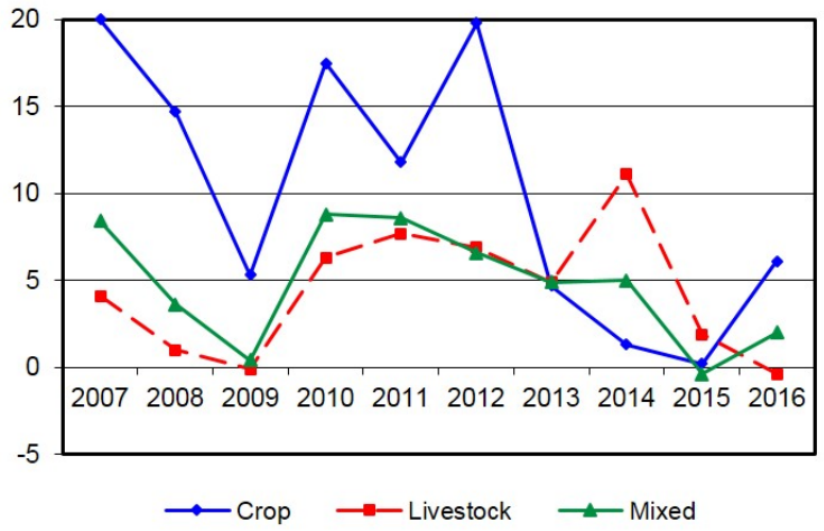
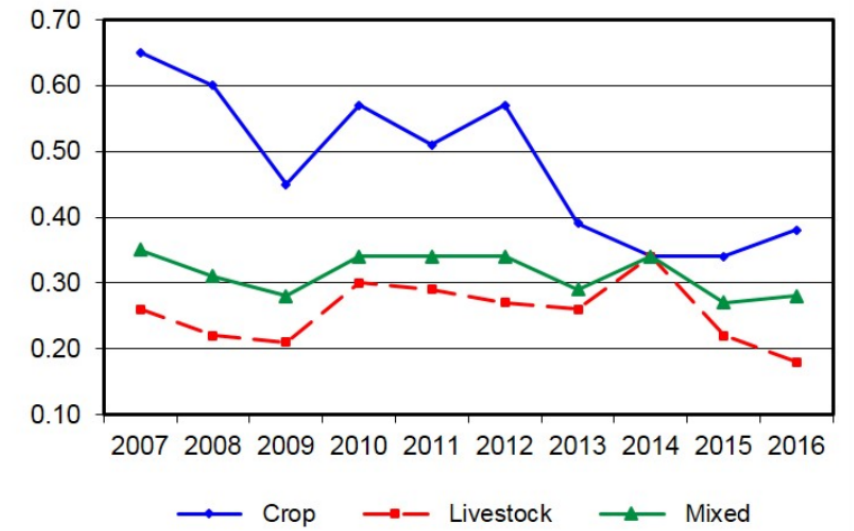


Figure 4. Median Asset Turnover Ratio by Farm Type, 2007-2016, N.D. Farm Mgt. Program



Farm Sales

Farms were classified in one of four cash farm sales categories. Farm sales include cash receipts from crop and livestock sales, government payments, and other farm income.

The categories were: less than $249,000
$250,000 to $499,999
$500,000 to 999,999
$1,000,000 or more

Highlights

- Median and average cash farm sales in 2016 were $535,952 and $704,566, respectively, up from $499,756 and $687,287, respectively, in 2015
- Gross sales are correlated to region and farm type. In 2016, 64% of Red River Valley farms had sales in excess of $500,000, compared to 42% in the west region. Also, 61% of crop farms had sales greater than $500,000 compared to 19% of livestock farms.
- Young farmers typically have lower sales than older farmers, but farmers between the ages of 40 and 50 have usually been more likely to have farm sales greater than $500,000 than farmers 50 years and older.
- In 2016, farms with less than $250,000 sales were more than twice as likely to rent all cropland than farms with larger sales.
- Typically, there is a strong direct relationship between the level of gross sales and financial performance. However, in 2014, this relationship weakened because crop farms were much less profitable than livestock farms despite being over twice as likely to have sales greater than $500,000.
- In 2016, median net farm income increased 50%, to $15,915, for farms with less than $250,000 sales, increased 280%, to $78,082, for farms with sales $250,000 to $499,999, increased 303%, to $129,648, for farms with sales $500,000 to $999,999, and increased 276%, to $219,593, for farms with sales greater than $1,000,000.
- Farms with low sales typically have worse solvency. The median debt-to-asset was 55.9%, 44.3%, 42.2%, and 42.1% for the lowest to highest farm sale groups, respectively, in 2016.
- In 2016, the medium term debt coverage ratio was 1.53 for farms with less than $250,000 sales and 1.70 for farms with greater than $1,000,000 sales. Typically, repayment capacity is directly related to amount of sales. However, in 2013, 2014 and 2015 the opposite occurred.
- Farms with greater sales typically use a smaller portion of gross revenue for interest expense. The five-year average, 2011-2015 median interest expense as a percent of gross revenue was 4.6%, 3.8%, 3.6% and 2.9% for the lowest to highest farm sale categories, respectively. In 2016, it was 5.4%, 4.4%, 3.7%, and 3.5% for the lowest to highest farm sales categories, respectively.
- In 2016, the median rates of return on equity ranged from 1.0% for farms with less than $250,000 sales to 6.8% for farms with greater than $1,000,000 sales. Typical median rates of return on equity and assets are directly related to sales, however, there was an indirect relation in 2014 and a weak relationship in 2015.

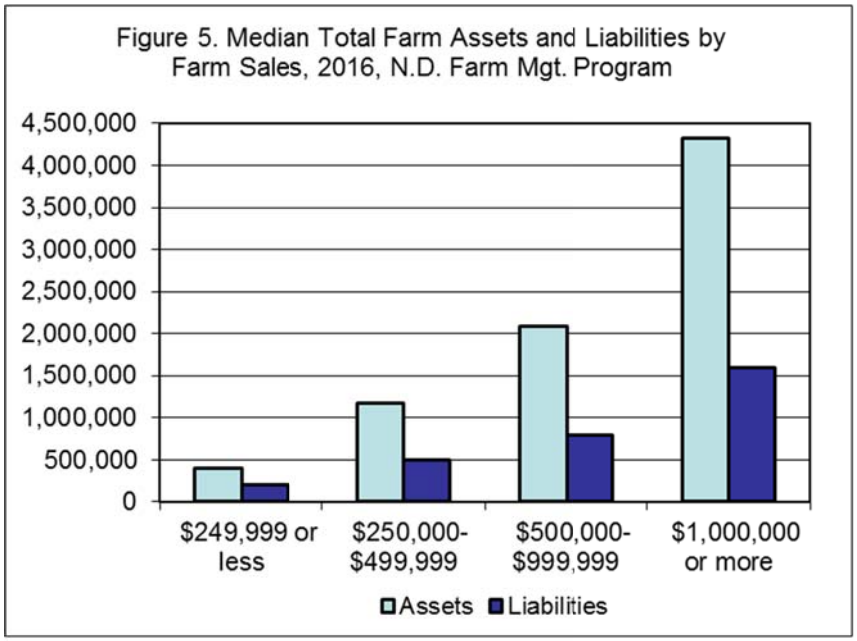


Figure 5. Median Total Farm Assets and Liabilities by Farm Sales, 2016, N.D. Farm Mgt. Program
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
$249,999 or less
$250,000-$499,999
$500,000-$999,999
$1,000,000 or more
Assets
Liabilities

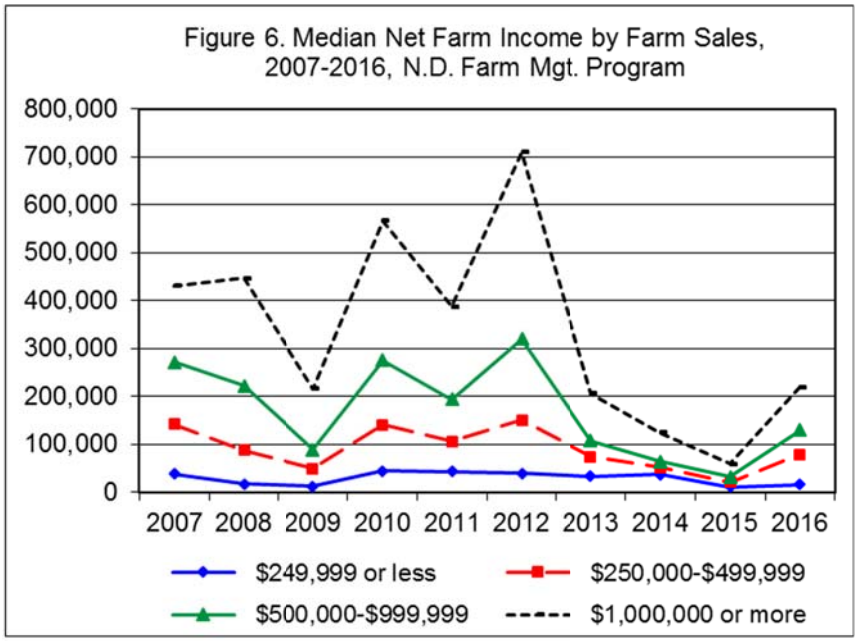


Figure 6. Median Net Farm Income by Farm Sales, 2007-2016, N.D. Farm Mgt. Program
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016
$249,999 or less
$250,000-$499,999
$500,000-$999,999
$1,000,000 or more

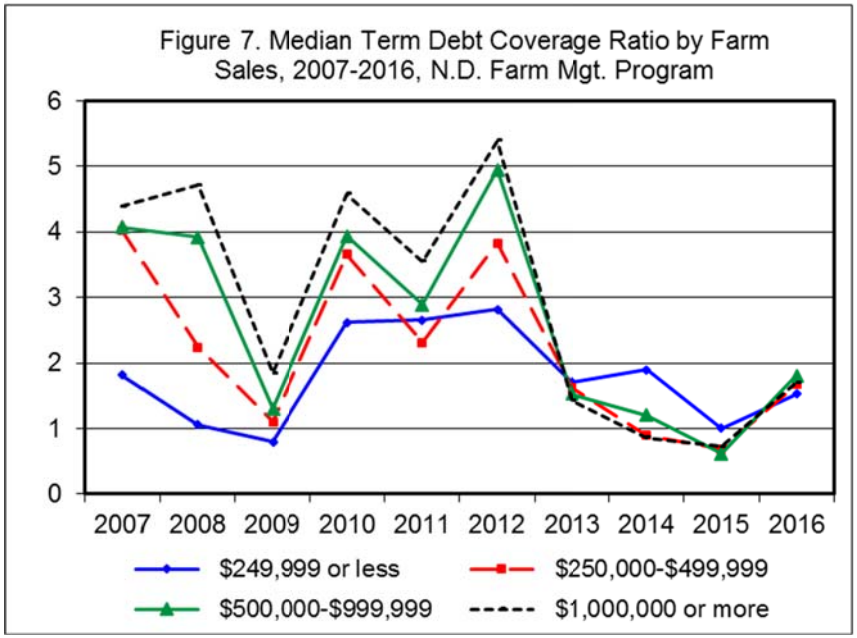


Figure 7. Median Term Debt Coverage Ratio by Farm Sales, 2007-2016, N.D. Farm Mgt. Program
6
5
4
3
2
1
0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016
$249,999 or less
$250,000-$499,999
$500,000-$999,999
$1,000,000 or more

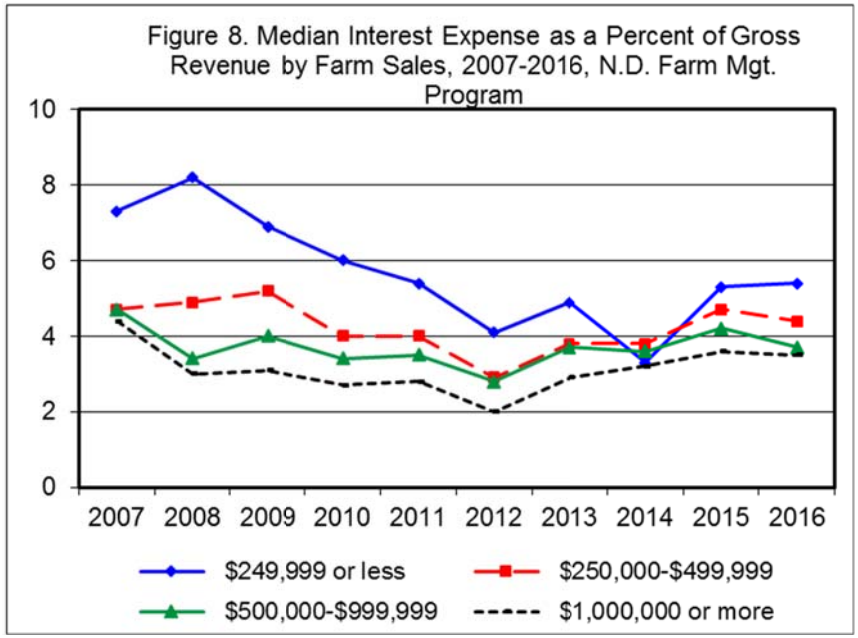


Figure 8. Median Interest Expense as a Percent of Gross Revenue by Farm Sales, 2007-2016, N.D. Farm Mgt. Program
10
8
6
4
2
0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016
$249,999 or less
$250,000-$499,999
$500,000-$999,999
$1,000,000 or more

Farm Size

Both crop and pasture acres were included in determining farm size.

Farm size categories were: 1,999 acres or less
2,000 acres or more

Highlights

- Because of little pasture land and more productive and expensive crop land, only about one-fifth of the Red River Valley farms were larger than 2,000 acres, compared to two-thirds of west region farms and about one-half of farms in the central regions.

- From 2007 to 2016, mixed enterprise farms have typically been more likely to be larger than 2,000 acres than were crop or livestock farms. In 2016, 59% of mixed enterprise farms were larger than 2,000 acres compared to 45% of crop farms and 37% of livestock farms.

- In 2007 through 2016, less than one-third of farmers under 40 years old operated more than 2,000 acres compared to about 60% of farmers between 40 and 49 years old and over one-half of farmers 50 years or older.

- As expected, farms with greater than 2,000 acres have greater assets, liabilities, sales and profitability than smaller farms. Larger farms also have better solvency. In 2016, median debt-to-asset was 49.0% for farms less than 2,000 acres and 43.7% for larger sized farms.

- In 2016, median net farm income increased 228%, to $56,584 for farms with less than 2,000 acres and 376%, to $148,850 for farms with more than 2,000 acres. Historically, farms with more than 2,000 acres have over twice the net farm income of the small farm group. The five-year average, 2011-2015, median net farm income was $75,289 for farms less than 2,000 acres and $180,108 for farms with greater than 2,000 acres.

- Median current ratio in 2016 was 1.5 for both farms with less than 2,000 acres and for the larger farm size group. The five-year average, 2011-2015, median current ratio was 1.9 for farms with less than 2000 acres and 1.8 for farms larger than 2000 acres.

- Median term debt coverage ratio was better for farms with less than 2,000 acres than for larger farms in four of past 10 years: 2012, 2013, 2015 and 2016. In 2016, it was 1.73 for farms with less than 2,000 acres and 1.57 for larger farmers.

- In 2016, median operating expense (excluding depreciation and interest) as a percent of gross revenue was 69.2% for farms with less than 2,000 acres and 69.3% for farms with greater than 2,000 acres. Financial efficiency measures of farm size groups are typically similar. This indicates that greater profitability of farms larger than 2,000 acres is due to larger sales volume and/or greater operator-labor efficiencies, not lower operating expenses per dollar of sales.

Cropland Tenure

This is a classification of the portion of crop land that is rented. Four categories were used.

Full tenant
1-20 percent owned
21-40 percent owned
41 percent or over owned

Highlights

- Substantial ownership of crop land is less likely in the Red River Valley. About one out of five Red River Valley farms owned more than 40% of the crop land they operated, compared to about one-third of farms in other regions.

- Crop land ownership increases with age. Farmers 50 years or older were over three times more likely to own more than 40% of their crop land than young farmers and about four of ten young farmers rented all of their crop land, compared to one of ten farmers 50 years or older.

- Operators of livestock and mixed enterprise farms own a greater portion of their crop land than crop farms. Nearly one-half of livestock and mixed enterprise farms owned more than 40% of the crop land that they operate, compared to one-fourth of crop farms.

- Typically, small farms (less than 2,000 acres) are twice as likely than large farms (more than 2,000 acres) to own no crop land, and large farms much more likely to own between 1% and 40% of crop land as smaller farms. However, both farm size groups were as likely to own over 40% of their crop land.

- Typically, farms that own some land, but less than 40%, are the most profitable, and are more likely to be crop farms, farm more acreage, and have larger sales. The five-year 2011-2015 average median net farm income was about $150,000 for farms with 1% to 40% crop land ownership compared to $74,360 for farms that rent all crop land and $90,280 for farms that own over 40% of their crop land.

- Farms with greater than 40% crop land ownership are typically lower profit than farms with 1% to 40% crop land ownership probably because these farms are more likely to be in the low sales farm category and are less likely to be crop farms or in the Red River Valley Region.

- The only years in the 2007-2016 period when farms that rented all cropland had greater median net farm income than farms that owned more than 40% of cropland were 2015 and 2016.

- In the past ten years, farms that owned greater than 40% of their crop land typically have a slightly higher current ratio. In 2016, farms with greater than 40% crop land ownership had a median current ratio of 1.6 compared to 1.3 to 1.5 for the other tenure groups.

- Farms with greater crop land ownership typically have better solvency. In 2016, median debt-to-asset ratio was 51.8% for farms with no crop land ownership, 48.4% for farms with 1%-20% crop land ownership, 46.4% for farms with 21%-40% crop land ownership, and 40.5% for farms with crop land ownership greater than 40%. One reason could be that older, more established farmers own a greater portion of their crop land.

- Farms with a smaller proportion of crop land ownership have fewer land assets and land interest costs and therefore have substantially higher asset turnover ratios and lower interest expense as a percent of gross revenue.

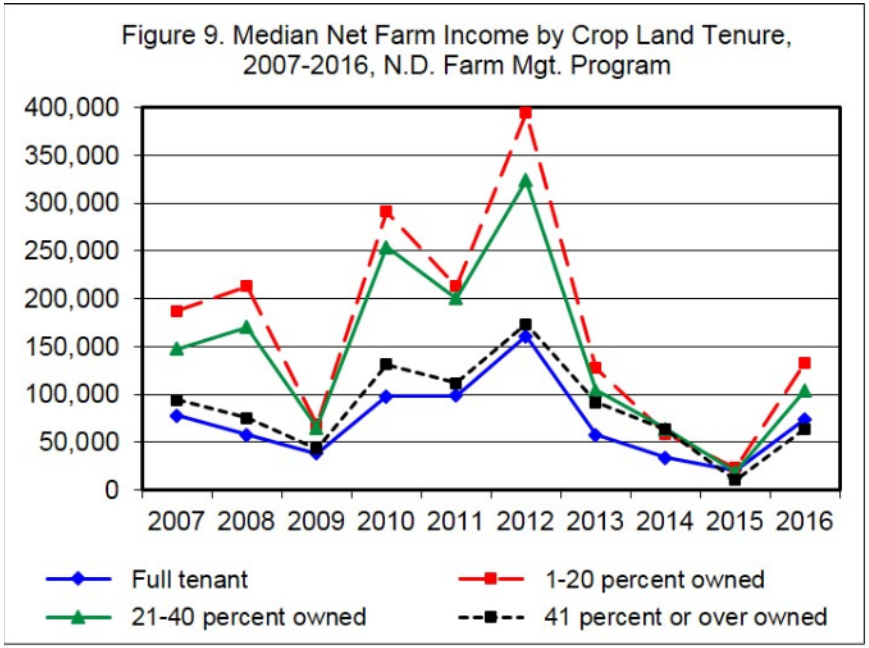


Figure 9. Median Net Farm Income by Crop Land Tenure, 2007-2016, N.D. Farm Mgt. Program
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016
Full tenant
1-20 percent owned
21-40 percent owned
41 percent or over owned

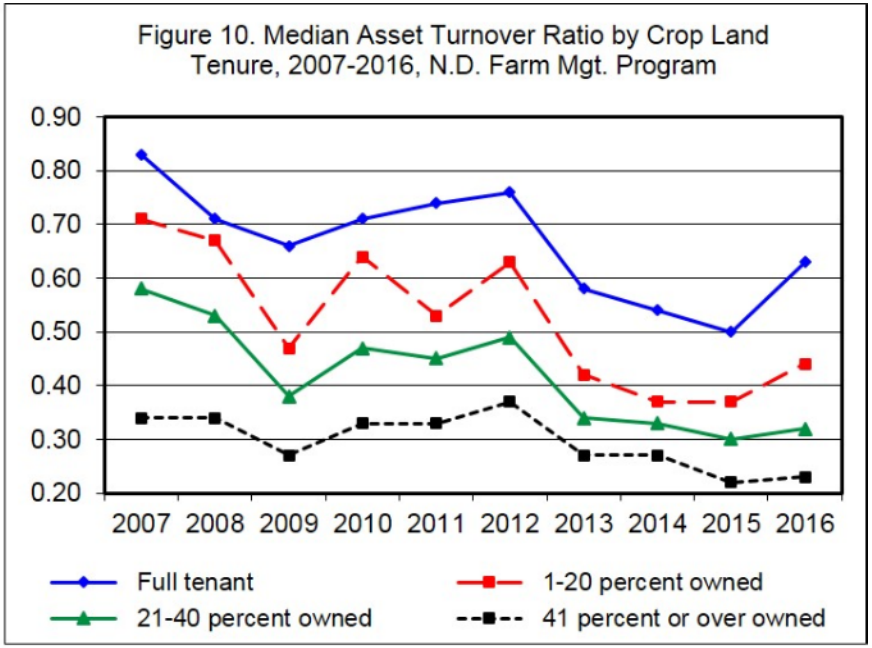


Figure 10. Median Asset Turnover Ratio by Crop Land Tenure, 2007-2016, N.D. Farm Mgt. Program
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016
Full tenant
1-20 percent owned
21-40 percent owned
41 percent or over owned

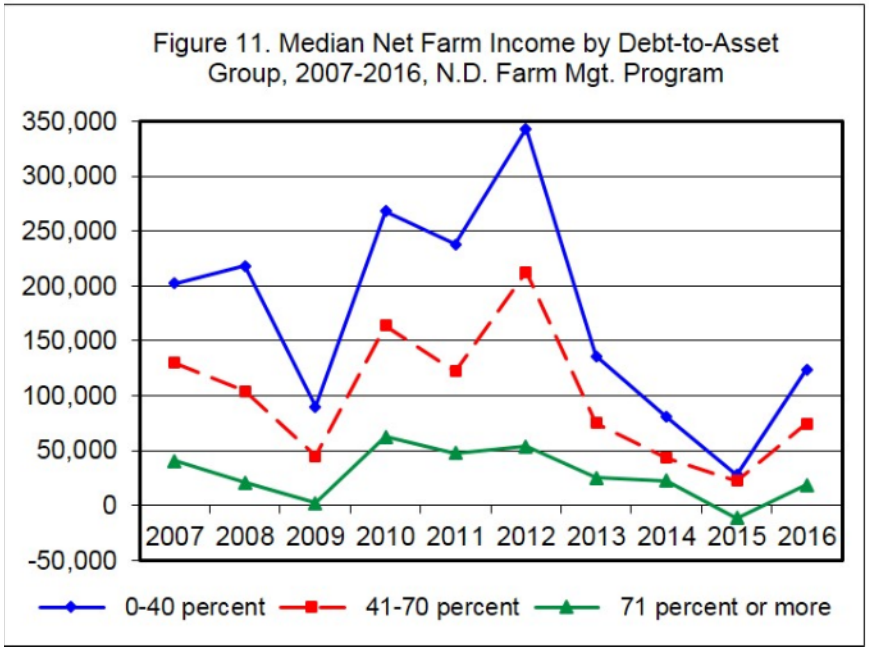


Figure 11. Median Net Farm Income by Debt-to-Asset Group, 2007-2016, N.D. Farm Mgt. Program
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
-50,000
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016
0-40 percent
41-70 percent
71 percent or more

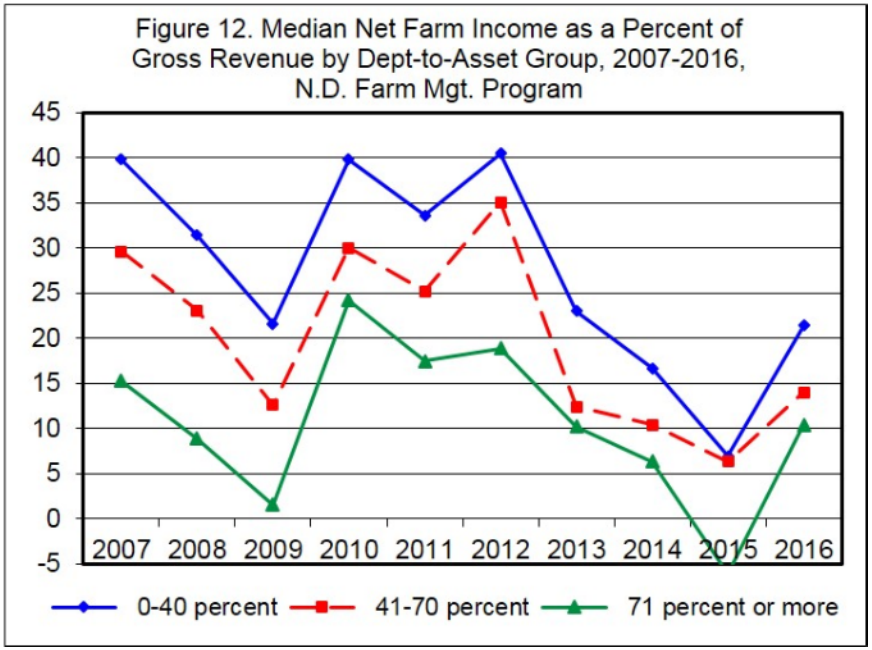


Figure 12. Median Net Farm Income as a Percent of Gross Revenue by Dept-to-Asset Group, 2007-2016, N.D. Farm Mgt. Program
45
40
35
30
25
20
15
10
5
0
-5
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016
0-40 percent
41-70 percent
71 percent or more

Net Farm Income

Four levels of net farm income were used to group farms.

$49,999 or less
$50,000 - $99,999
$100,000 - $199,999
$200,000 or more

Highlights

- Farm profit is volatile. In the four years that median net farm income increased during the 10-year period, 2007-2016, the average increase was 230%. The average decline was 42% for the six years that net income dropped. Year-to-year changes in median net farm income within regions and farm types is greater. Statewide, median net farm income increased 333% in 2016, after decreasing 65%, 40% and 62% in 2015, 2014 and 2013, respectively

- Median net farm income was $82,178 in 2016, down from $18,982 in 2015, $54,543 in 2014, and $90,529 in 2013. The five highest median net farm income years in the 2007-2016 period were $238,054 in 2012, $174,010 in 2010, $144,414 in 2011, $127,791 in 2007, and $114,520 in 2008.

- The Red River Valley had the highest median net farm income six out of ten years from 2007 to 2016 and the north central region was the highest in three years. The west region farms had the lowest median net farm income seven of the ten years, but the highest in 2014.

- Typically, crop farms have been more profitable than livestock farms. An exception was 2014 when median net farm income was $95,130 for livestock farms and $32,347 for crop farms. The five-year average, 2011-2015, median net farm income was $133,869 for crop farms and $51,119 for livestock farms.

- As expected, net farm income is strongly associated with farm sales and farm size. In 2016, 37% of farms with sales greater than $500,000 had net farm income greater than $200,000, compared to 1% of farms with less than $500,000 sales. Farms larger than 2,000 acres were over five times more likely to have net farm income greater than $200,000 than were smaller farms.

- In all but five years from 2007 to 2016, farmers 40 to 49 years old had higher median net farm income than farmers that were younger or older. The exceptions were older farmers in 2009, 2011, 2013 and 2016, and younger farmers in 2015.

- Solvency, liquidity, repayment capacity, and financial efficiency were strongly correlated with net farm income.

- Low-debt farms (less than 40% debt-to-asset) are typically three to four times more likely to have net farm income in excess of $200,000 than high-debt farms (greater than 70% debt).

Debt-to-Asset Ratio

Three ranges of debt-to-asset ratio were used to group farms.

0 - 40 percent
41 - 70 percent
71 percent or more

Highlights

- The median debt-to-asset of all farms generally improved from 2006 until 2012, to 40.6%. It weakened each year since 2012 to 46.5% in 2015. In 2016, it improved to 45.9%
- The median debt-to-asset of farms in the north central region was the best in 2013, 2009, 2008 and 2007 compared to other regions. However, the Red River Valley had the best solvency in all other years during the 2007-2016 period.
- Crop farms had the best solvency (lowest debt-to-asset) compared to other farm types during the past ten years, 2007-2016.
- Large farms (greater than 2,000 acres) and farms with sales greater than $500,000 always had lower median debt-to-asset than other farm size and farm sales groups, respectively, during the 2007-2016 period.
- There is a strong inverse relationship between level of debt and liquidity, repayment capacity, profitability and financial efficiency measures. As debt-to-asset increases, these measures deteriorate.
- In 2016, farms in the low, medium and high debt-to-asset categories had median current ratios of 3.0, 1.3 and 1.0; term debt coverage ratios of 2.68, 1.43, and 0.81; interest expense as a percent of gross revenue of 2.2, 5.0, and 8.2; and net farm income as percent of gross revenue 21.4, 14.0 and 10.4, respectively.
- In 2016, farms with sales less than $250,000 were three times more likely to be in the high debt group than farms with sales greater than $1,000,000.
- As expected, percent debt-to-asset tended to decrease as age of farmer increased. In 2016, median debt-to-asset was 58.0% for farmers younger than 40 years, 53.1% for farmers 40-49 years and 36.1% for farmers 50 years or older.
- In 2016, median net farm income increased to $124,141 for the low debt-to-asset category, and to $74,473 and $18,759 for the medium and high debt-to-asset categories, respectively.
- In 2016, 31% of farms with low debt had net farm income greater than $200,000, compared to 11% of high-debt farms.

Farmer Age

Three groups were used to classify farms by age of operator:

39 years or less
40 - 49 years
50 years or older

Highlights

- In 2016, 37% of farm operators were under 40 years old, 16% were 40 to 49 years old, and 47% were 50 and older.
- The age distribution of farm operators has been similar across regions during the 2007-2013 period, but in 2014-2016, farmers in the west were slightly more likely to be younger than 40 years old than in other regions.
- Farms in the middle age group typically have more liabilities, higher gross sales, larger farms and been more profitable than the younger or older age groups. However, median net farm income was highest for farmers older than 50 years in 2009, 2011, 2013 and 2016, and for farmers less than 40 years old in 2015.
- For each age group, the years 2012, 2011, 2010, 2008 and 2007 had much higher median net farm income than other years during the 2007-2016 period. In 2016 median net farm income was the highest, $106,126, for farmers 50 years and older and the lowest, $64,261, for farmers under 40 years old. It was $96,389 for farmers who were 40 to 49 years old.
- Median total assets are lowest for farm operators less than 40 years old. Median total assets of farmers between 40 and 49 years old and the older age group of farmers (50 years and older) were similar in 2007-2010, but greater for older farmers since 2010.
- As expected, there is a higher percent of crop land owned, and the percent of farm debt tends to decrease as the age of the farm operator increases. In 2016, median debt-to-asset was 58.0% for farmers less than 40 years old, 53.1% for farmers in the 40 to 49 age group and 36.1% for farmers 50 or older.
- From 2007 through 2016, median current ratio improved with farmer age. In 2016, it was 1.6 for farmers 50 years and older and 1.5 for the middle and young age groups.
- The only years in the 2007-2016 period that farmers older than 50 years had a median term debt coverage ratio less than 1.0, and a ratio which was lower than the other age groups were in 2014, at 0.86, and in 2015, at 0.59. In 2016, the median term debt coverage ratio was 2.16 for farmers less than 40 years old, 1.56 for farmers 50 years and older and 1.17 for farmers 40 to 49 years old.
- In each year, 2007-2016, the young age group of farmers employed assets more efficiently than farmers 50 and older. The young group had much fewer total assets and higher debt-to-asset, but achieved better median rates of return on assets and equity, and asset turnover.

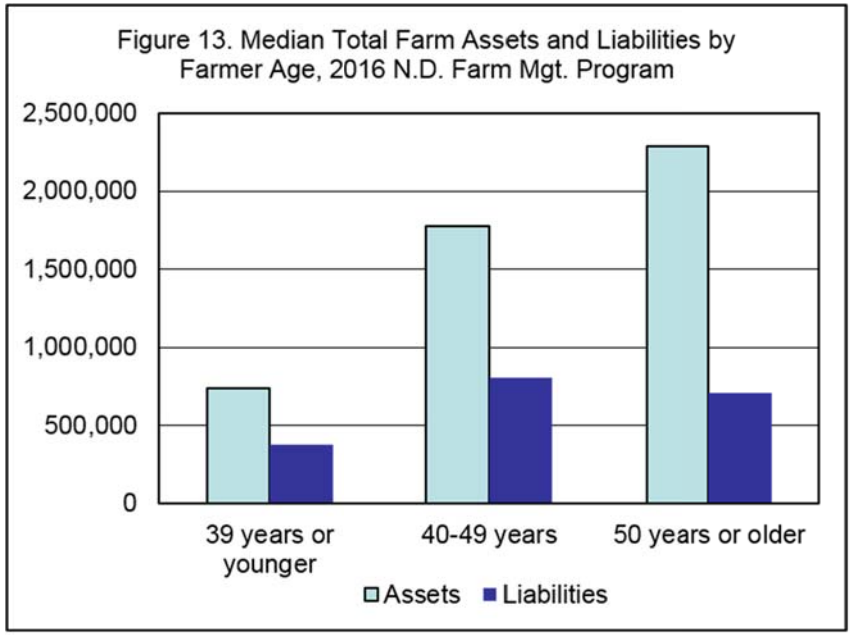


Figure 13. Median Total Farm Assets and Liabilities by Farmer Age, 2016 N.D. Farm Mgt. Program
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
39 years or younger
40-49 years
50 years or older
Assets
Liabilities

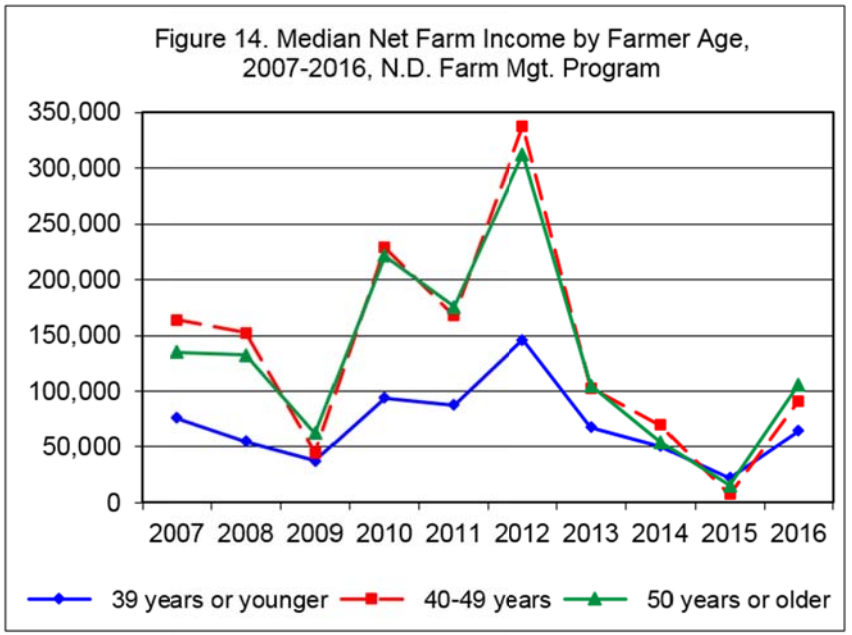


Figure 14. Median Net Farm Income by Farmer Age, 2007-2016, N.D. Farm Mgt. Program
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016
39 years or younger
40-49 years
50 years or older

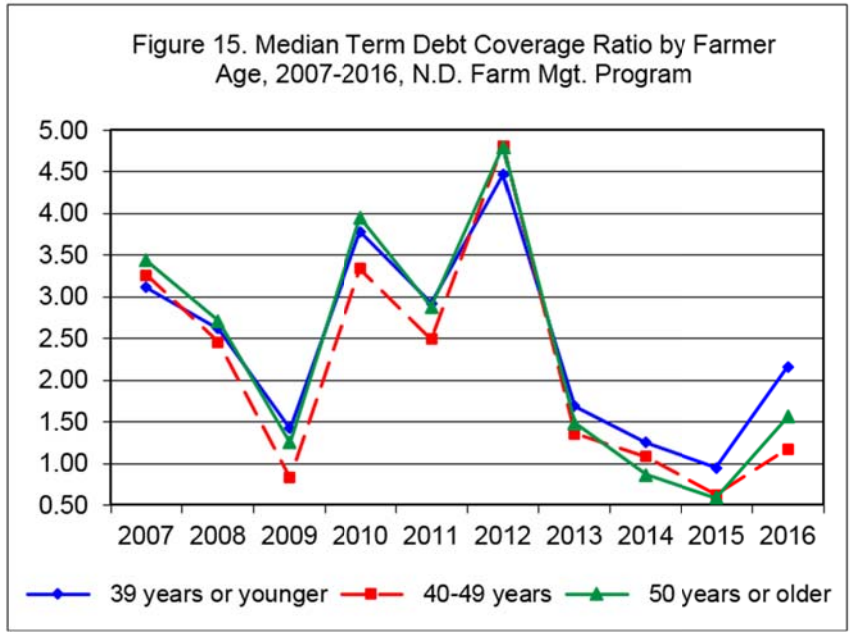


Figure 15. Median Term Debt Coverage Ratio by Farmer Age, 2007-2016, N.D. Farm Mgt. Program
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016
39 years or younger
40-49 years
50 years or older

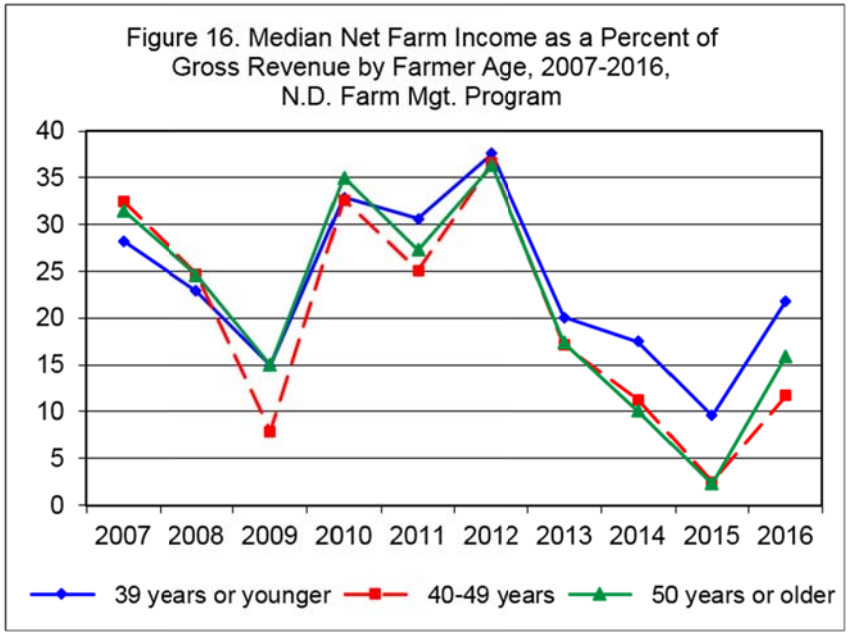


Figure 16. Median Net Farm Income as a Percent of Gross Revenue by Farmer Age, 2007-2016, N.D. Farm Mgt. Program
40
35
30
25
20
15
10
5
0
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016
39 years or younger
40-49 years
50 years or older

Table 3. Current Assets and Current Liabilities, Quartile Values for 2016, Median Values for 2015, and 5-Year Average, 2011-2015, of Median Values, North Dakota Farm Business Management Education Program Participants.

Farm Group	2016 Upper Quartile	2016 Lower Quartile	2016 Median	2015 Median	Average of 2011-2015 Medians	2016 Upper Quartile	2016 Lower Quartile	2016 Median	2015 Median	Average of 2011-2015 Medians
	Current Farm Assets ($)					Current Farm Liabilities ($)				
All Farms	750,297	185,201	431,013	387,912	422,402	69,893	465,244	224,140	234,343	196,104
Region										
Red River Valley	856,485	270,019	535,291	490,402	539,664	69,681	505,131	234,412	264,966	224,095
North Central	693,124	189,053	425,187	358,395	396,838	64,809	434,406	235,037	245,267	191,212
South Central	726,991	175,543	425,826	410,982	422,756	77,755	507,612	215,889	221,385	192,514
West	668,514	139,756	281,994	295,166	370,677	72,654	426,774	198,523	169,848	181,523
Farm Enterprise										
Crop	866,451	243,654	502,695	459,408	508,113	95,784	543,065	254,708	286,875	243,922
Livestock	321,806	51,609	158,343	178,506	168,598	29,912	226,876	75,859	86,677	69,335
Mixed	609,082	211,391	385,641	366,844	328,553	107,646	355,263	254,422	268,267	196,015
Farm Sales										
$249,999 or less	161,883	39,274	87,841	80,593	102,502	19,179	97,502	48,783	51,494	48,515
$250,000-$499,999	425,444	226,327	297,153	311,930	290,061	92,223	271,523	184,337	174,050	143,999
$500,000-$999,999	753,070	430,345	576,000	543,621	542,254	171,964	509,182	341,919	376,436	282,309
$1,000,000 or more	1,877,326	871,732	1,238,300	1,167,804	1,148,542	411,284	1,073,687	695,804	710,125	545,699
Farm Size										
1,999 acres or less	459,804	89,601	233,332	236,986	252,990	34,194	241,178	112,652	120,169	102,080
2,000 acres or more	1,226,126	444,255	695,144	638,476	716,472	246,046	740,460	414,260	454,701	367,474
Cropland Tenure										
Full tenant	575,131	89,857	243,800	227,437	241,421	30,575	287,617	117,468	139,413	102,530
1-20 percent owned	1,022,002	321,849	558,060	567,452	618,276	183,768	599,924	366,663	398,539	313,491
21-40 percent owned	1,020,097	372,217	612,656	520,485	549,251	167,301	700,020	356,338	388,696	293,853
41 percent or more owned	673,293	186,496	421,645	379,571	413,657	72,334	369,476	190,492	170,017	153,620
Net Farm Income										
$49,999 or less	449,941	63,853	186,076	294,612	209,315	34,490	332,307	117,438	200,473	140,686
$50,000-$99,999	459,479	177,506	275,091	414,377	273,550	76,977	338,982	163,185	240,087	138,035
$100,000-$199,999	781,776	385,641	509,998	618,970	459,021	141,951	458,098	262,218	280,337	197,051
$200,000 or more	1,654,046	681,861	1,078,411	1,034,005	923,798	231,193	830,000	456,804	558,698	367,750
Debt-to-Asset Ratio										
0-40 percent	986,666	257,158	563,840	503,617	575,388	40,637	351,573	161,788	136,234	130,591
41-70 percent	654,613	176,739	362,101	368,213	379,092	117,065	577,643	271,617	303,087	273,780
71 percent or more	506,581	89,601	225,708	237,629	204,682	82,829	544,362	230,804	291,731	232,775
Farmer Age										
39 years or younger	450,636	85,739	233,332	220,496	228,920	40,821	304,136	145,624	133,753	114,136
40-49 years	759,948	286,980	479,550	479,845	515,933	123,438	577,643	317,262	397,503	294,761
50 years or older	1,001,543	298,045	598,142	527,113	565,599	100,029	566,859	275,952	295,756	243,440

Table 4. Liquidity Measures, Quartile Values for 2016, Median Values for 2015, and 5-Year Average, 2011-2015, of Median Values, North Dakota Farm Business Management Education Program Participants.

Farm Group	2016 Current Ratio Upper Quartile	2016 Current Ratio Lower Quartile	2016 Current Ratio Median	2015 Current Ratio Median	Average of 2011-2015 Current Ratio Medians	2016 Working Capital ($) Upper Quartile	2016 Working Capital ($) Lower Quartile	2016 Working Capital ($) Median	2015 Working Capital ($) Median	Average of 2011-2015 Working Capital ($) Medians
All Farms	2.8	1.1	1.5	1.3	1.8	308,541	14,293	108,748	61,285	146,476
Region										
Red River Valley	4.0	1.1	1.7	1.5	2.3	438,114	39,690	132,274	144,553	263,361
North Central	2.7	1.1	1.5	1.2	1.8	297,811	23,302	100,756	46,724	128,787
South Central	2.9	1.1	1.6	1.3	1.8	291,136	12,947	116,255	54,208	133,425
West	2.4	0.9	1.3	1.3	1.6	182,446	(6,345)	37,165	56,052	108,663
Farm Enterprise										
Crop	3.3	1.1	1.6	1.3	1.9	385,953	29,275	126,467	80,078	195,026
Livestock	1.9	0.9	1.5	1.7	1.9	110,799	(4,672)	19,879	51,842	67,198
Mixed	1.9	1.0	1.3	1.2	1.6	204,858	2,667	109,145	39,887	92,009
Farm Sales										
$249,999 or less	3.0	1.0	1.6	1.4	1.8	71,538	733	23,398	18,858	39,482
$250,000-$499,999	2.9	1.1	1.5	1.3	1.8	206,769	23,533	97,676	75,500	106,282
$500,000-$999,999	2.5	1.1	1.5	1.3	1.9	384,802	58,890	173,990	127,848	224,178
$1,000,000 or more	2.6	1.1	1.6	1.3	2.0	957,270	113,734	369,601	339,745	512,596
Farm Size										
1,999 acres or less	3.1	1.1	1.5	1.4	1.9	186,000	9,683	64,503	49,628	92,318
2,000 acres or more	2.4	1.1	1.5	1.3	1.8	502,004	35,648	192,356	106,888	256,101
Cropland Tenure										
Full tenant	3.7	1.1	1.5	1.3	1.7	192,646	13,703	67,273	36,030	76,481
1-20 percent owned	2.5	1.1	1.5	1.3	1.8	451,253	45,415	149,385	111,739	244,283
21-40 percent owned	2.3	1.0	1.3	1.2	1.8	353,406	11,572	123,101	70,150	203,239
41 percent or more owned	2.8	1.1	1.6	1.4	2.0	315,615	21,717	118,254	85,473	149,846
Net Farm Income										
$49,999 or less	2.1	0.9	1.2	1.2	1.4	97,504	(14,798)	21,406	29,381	29,746
$50,000-$99,999	2.6	1.1	1.4	1.5	2.0	178,522	23,187	72,844	144,197	107,977
$100,000-$199,999	2.9	1.2	1.6	1.6	1.9	376,090	93,923	176,239	237,178	179,606
$200,000 or more	3.9	1.3	2.0	2.1	2.7	1,005,253	215,583	469,494	372,872	508,874
Debt-to-Asset Ratio										
0-40 percent	8.8	1.9	3.0	2.9	3.8	667,632	112,666	319,057	288,583	388,513
41-70 percent	1.7	1.1	1.3	1.2	1.4	172,135	12,982	71,217	38,099	85,966
71 percent or more	1.2	0.8	1.0	0.8	1.0	52,785	(48,893)	906	-28,041	(6,579)
Farmer Age										
39 years or younger	2.1	1.1	1.5	1.3	1.6	126,520	9,312	52,785	32,493	69,567
40-49 years	2.5	1.0	1.5	1.3	1.7	320,994	(7,361)	124,991	59,543	167,641
50 years or older	3.6	1.1	1.6	1.5	2.2	455,883	39,635	184,653	145,570	266,549

Table 5. Total Assets and Total Liabilities, Quartile Values for 2016, Median Values for 2015, and 5-year Average, 2011-2015, of Median Values, North Dakota Farm Business Management Education Program Participants.

Farm Group	2016 Upper Quartile	2016 Lower Quartile	2016 Median	2015 Median	Average of 2011-2015 Medians	2016 Upper Quartile	2016 Lower Quartile	2016 Median	2015 Median	Average of 2011-2015 Medians
	Total Farm Assets ($)					Total Farm Liabilities ($)				
All Farms	2,860,071	702,150	1,504,664	1,482,932	1,446,092	233,134	1,133,388	570,457	603,538	536,580
Region										
Red River Valley	3,194,523	954,827	1,784,724	1,878,818	1,751,239	228,661	1,170,120	641,712	671,477	637,646
North Central	2,608,365	712,929	1,468,315	1,391,138	1,365,421	235,992	1,080,229	568,094	594,845	501,107
South Central	3,197,843	691,667	1,660,641	1,716,992	1,548,290	253,101	1,181,855	594,257	622,775	525,180
West	2,283,118	521,689	1,024,339	1,034,238	1,179,527	240,206	1,037,481	508,538	504,142	536,690
Farm Enterprise										
Crop	3,103,264	887,521	1,759,173	1,837,635	1,754,750	259,600	1,239,923	652,117	677,553	610,621
Livestock	1,280,313	337,497	713,198	734,991	687,311	175,627	654,474	344,206	298,592	318,529
Mixed	2,530,236	656,173	1,449,968	1,405,653	1,248,782	263,487	1,020,398	608,462	675,892	504,441
Farm Sales										
$249,999 or less	657,580	185,312	393,246	401,040	446,789	79,742	355,183	196,163	220,674	200,916
$250,000-$499,999	1,536,920	758,139	1,179,942	1,111,922	964,193	247,165	730,394	503,277	470,545	421,411
$500,000-$999,999	2,757,759	1,455,073	2,089,536	2,130,177	1,869,661	431,553	1,241,274	787,980	892,377	685,497
$1,000,000 or more	5,691,636	3,113,778	4,317,877	4,351,455	3,749,043	1,090,532	2,375,176	1,600,619	1,502,225	1,249,486
Farm Size										
1,999 acres or less	1,599,481	393,852	872,237	847,034	824,829	136,859	708,021	339,667	321,777	326,812
2,000 acres or more	4,186,071	1,613,824	2,605,190	2,449,411	2,381,699	562,497	1,663,056	1,049,541	1,001,815	874,175
Cropland Tenure										
Full tenant	1,595,580	242,786	582,990	613,796	627,869	112,060	587,735	276,997	269,078	257,491
1-20 percent owned	3,062,120	1,083,195	1,657,913	1,919,352	1,869,727	440,142	1,365,347	757,554	848,319	728,632
21-40 percent owned	3,731,957	1,344,320	2,287,180	2,066,771	1,960,004	524,274	1,546,361	915,724	890,226	762,928
41 percent or more owned	3,056,026	961,753	1,829,538	1,823,540	1,650,134	282,762	1,153,652	620,679	570,473	509,651
Net Farm Income										
$49,999 or less	1,638,414	358,427	914,553	1,199,080	861,187	160,579	914,861	407,691	514,084	411,349
$50,000-$99,999	1,954,025	631,321	1,105,277	1,666,410	1,032,506	222,349	823,639	478,761	539,342	412,347
$100,000-$199,999	2,843,198	1,155,960	1,797,513	2,233,882	1,536,672	344,772	1,148,928	648,468	757,370	540,133
$200,000 or more	5,012,370	2,129,454	3,799,361	3,402,047	2,999,168	540,490	1,686,684	1,059,028	1,203,734	897,172
Debt-to-Asset Ratio										
0-40 percent	3,832,326	1,043,097	2,083,761	1,967,013	1,929,192	113,544	775,246	376,234	360,398	358,633
41-70 percent	2,472,888	701,805	1,333,389	1,374,989	1,311,998	355,259	1,344,937	726,075	762,730	696,125
71 percent or more	1,764,703	480,599	990,990	937,103	801,984	379,540	1,481,501	814,207	757,405	668,100
Farmer Age										
39 years or younger	1,428,022	296,852	738,466	744,064	726,294	158,475	763,169	381,017	433,354	413,203
40-49 years	2,694,640	1,190,326	1,775,861	1,756,675	1,676,504	489,226	1,389,684	805,599	892,407	724,608
50 years or older	3,832,326	1,269,829	2,287,180	2,237,987	2,065,611	305,895	1,331,103	708,021	671,423	583,293

Table 6. Solvency Measures, Quartile Values for 2016, Median Values for 2015, and 5-year Average, 2011-2015, of Median Values, North Dakota Farm Business Management Education Program Participants.

Farm Group	2016 Upper Quartile	2016 Lower Quartile	2016 Median	2015 Median	Average of 2011-2015 Medians	2016 Upper Quartile	2016 Lower Quartile	2016 Median	2015 Median	Average of 2011-2015 Medians	2016 Upper Quartile	2016 Lower Quartile	2016 Median	2015 Median	Average of 2011-2015 Medians
	Debt-to-Asset (%)					Equity-to-Asset (%)					Debt-to-Equity				
All Farms	26.6	64.7	45.9	46.5	43.5	73.4	35.3	54.1	53.5	56.5	0.4	1.8	0.8	0.9	0.8
Region															
Red River Valley	17.8	56.5	41.5	39.7	38.2	82.2	43.5	58.5	60.3	61.8	0.2	1.3	0.7	0.7	0.6
North Central	23.7	66.4	45.8	50.9	41.8	76.3	33.6	54.2	49.1	58.2	0.3	2.0	0.8	1.0	0.7
South Central	28.5	63.2	43.8	44.0	43.0	71.5	36.8	56.2	56.0	57.0	0.4	1.7	0.8	0.8	0.8
West	37.4	75.8	59.4	58.6	54.3	62.6	24.2	40.6	41.4	45.7	0.6	3.1	1.5	1.4	1.2
Farm Enterprise															
Crop	20.5	61.5	42.7	45.2	40.7	79.5	38.5	57.3	54.8	59.3	0.3	1.6	0.7	0.8	0.7
Livestock	41.1	75.1	58.4	55.9	54.5	58.9	24.9	41.6	44.1	45.5	0.7	3.0	1.4	1.3	1.2
Mixed	36.0	69.9	48.1	46.2	45.8	64.0	30.1	51.9	53.8	54.2	0.6	2.3	0.9	0.9	0.8
Farm Sales															
$249,999 or less	36.3	73.3	55.9	59.5	53.1	63.7	26.7	44.1	40.5	46.9	0.6	2.7	1.3	1.5	1.1
$250,000-$499,999	26.0	64.1	44.3	45.7	46.1	74.0	35.9	55.7	54.3	53.9	0.4	1.8	0.8	0.8	0.9
$500,000-$999,999	22.7	63.1	42.2	44.1	40.3	77.3	36.9	57.8	55.9	59.7	0.3	1.7	0.7	0.8	0.7
$1,000,000 or more	26.1	58.3	42.1	40.9	37.3	73.9	41.7	57.9	59.1	62.7	0.4	1.4	0.7	0.7	0.6
Farm Size															
1,999 acres or less	26.8	65.6	49.0	50.2	45.9	73.2	34.4	51.0	49.8	54.1	0.4	1.9	1.0	1.0	0.8
2,000 acres or more	25.7	63.3	43.7	45.6	41.6	74.3	36.7	56.3	54.4	58.4	0.3	1.7	0.8	0.8	0.7
Cropland Tenure															
Full tenant	24.6	66.3	51.8	56.2	50.1	75.4	33.7	48.2	43.8	49.9	0.3	2.0	1.1	1.3	1.0
1-20 percent owned	27.8	63.5	48.4	46.2	41.4	72.2	36.5	51.6	53.8	58.6	0.4	1.7	0.9	0.9	0.7
21-40 percent owned	27.9	63.5	46.4	44.0	42.6	72.1	36.5	53.6	56.0	57.4	0.4	1.7	0.9	0.8	0.7
41 percent or more owned	21.4	61.1	40.5	41.3	39.1	78.6	38.9	59.5	58.7	60.9	0.3	1.6	0.7	0.7	0.6
Net Farm Income															
$49,999 or less	36.7	74.6	56.5	51.1	54.8	63.3	25.4	43.5	48.9	45.2	0.6	2.9	1.3	1.0	1.2
$50,000-$99,999	32.6	61.8	48.8	42.9	47.1	67.4	38.2	51.2	57.1	52.9	0.5	1.6	1.0	0.8	0.9
$100,000-$199,999	23.3	58.4	42.3	43.3	43.4	76.7	41.6	57.7	56.7	56.6	0.3	1.4	0.7	0.8	0.8
$200,000 or more	16.7	46.2	31.8	37.0	32.0	83.3	53.8	68.2	63.0	68.0	0.2	0.9	0.5	0.6	0.5
Debt-to-Asset Ratio															
0-40 percent	9.4	31.8	19.8	21.8	22.4	90.6	68.2	80.2	78.2	77.6	0.1	0.5	0.2	0.3	0.3
41-70 percent	46.6	60.8	54.6	55.3	53.3	53.4	39.2	45.4	44.7	46.7	0.9	1.6	1.2	1.2	1.1
71 percent or more	74.9	85.6	80.3	81.4	80.1	25.1	14.4	19.7	18.6	19.9	3.0	5.9	4.1	4.4	4.0
Farmer Age															
39 years or younger	41.4	72.8	58.0	60.8	56.2	58.6	27.2	42.0	39.2	43.8	0.7	2.7	1.4	1.6	1.3
40-49 years	27.1	69.5	53.1	51.7	44.7	72.9	30.5	46.9	48.3	55.3	0.4	2.3	1.1	1.1	0.8
50 years or older	16.2	53.4	36.1	36.2	33.5	83.8	46.6	63.9	63.8	66.5	0.2	1.1	0.6	0.6	0.5

Table 7. Rate of Return on Assets and Rate of Return on Equity Profitability Measures, Quartile Values for 2016, Median Values for 2015, and 5-year Average, 2011-2015, of Median Values, North Dakota Farm Business Management Education Program Participants.

Farm Group	2016 Upper Quartile	2016 Lower Quartile	2016 Median	2015 Median	Average of 2011-2015 Medians	2016 Upper Quartile	2016 Lower Quartile	2016 Median	2015 Median	Average of 2011-2015 Medians
	Return on Farm Assets (%)					Return on Farm Equity (%)				
All Farms	9.6	0.7	4.8	0.4	6.9	14.3	-1.5	5.3	-1.6	9.2
Region										
Red River Valley	7.5	0.8	4.3	1.4	7.7	10.6	-1.2	4.6	-0.2	10.0
North Central	11.6	2.2	6.1	-0.4	7.5	20.9	0.4	7.4	-2.7	9.7
South Central	10.0	1.4	5.2	0.5	6.9	15.4	-1.0	6.0	-1.7	9.3
West	7.2	-3.0	1.7	0.1	5.6	10.1	-9.7	0.0	-2.3	7.6
Farm Enterprise										
Crop	11.0	2.5	6.1	0.2	7.6	18.7	1.0	7.4	-1.6	10.0
Livestock	3.5	-4.6	-0.4	1.9	6.5	3.7	-13.7	-4.8	1.0	10.5
Mixed	5.6	-0.8	2.0	-0.4	4.9	7.6	-3.7	0.7	-3.7	5.5
Farm Sales										
$249,999 or less	11.3	-2.8	3.0	0.6	5.3	19.8	-10.0	1.0	-1.8	6.7
$250,000-$499,999	8.6	1.6	5.1	-0.1	6.8	13.7	-0.3	5.0	-2.3	10.2
$500,000-$999,999	10.3	1.7	5.0	0.2	6.9	15.3	0.1	5.9	-1.0	9.0
$1,000,000 or more	9.2	2.1	5.3	0.7	8.0	12.0	0.6	6.8	-1.3	11.1
Farm Size										
1,999 acres or less	10.2	0.2	4.4	0.7	7.1	16.2	-2.6	4.6	-1.2	9.9
2,000 acres or more	9.0	1.4	5.2	0.2	7.0	12.6	-0.8	5.6	-2.0	8.9
Cropland Tenure										
Full tenant	18.9	1.8	9.1	1.7	10.2	32.3	0.2	12.4	0.0	15.8
1-20 percent owned	10.9	2.3	6.4	0.0	8.0	20.1	0.0	8.0	-2.4	11.4
21-40 percent owned	7.4	0.5	3.9	0.3	7.0	9.4	-3.5	4.1	-2.5	8.6
41 percent or more owned	6.0	0.1	3.1	0.1	5.4	7.8	-2.2	2.5	-1.6	6.2
Net Farm Income										
$49,999 or less	2.0	-3.8	-0.6	-1.9	0.1	0.0	-13.8	-4.6	-5.5	-3.1
$50,000-$99,999	9.3	3.1	5.5	3.2	6.1	21.2	2.8	7.0	2.5	8.3
$100,000-$199,999	11.0	4.1	6.4	5.3	8.8	18.8	4.6	8.7	5.4	13.2
$200,000 or more	13.9	6.7	9.9	7.8	12.0	23.6	8.1	12.2	9.9	16.6
Debt-to-Asset Ratio										
0-40 percent	9.0	1.7	5.0	0.5	7.7	11.0	1.3	5.5	-0.7	8.9
41-70 percent	10.5	0.8	5.0	1.4	7.3	20.0	-3.5	6.2	-1.0	11.5
71 percent or more	9.7	-3.2	2.9	-2.2	3.3	29.0	-28.3	0.0	-21.1	1.9
Farmer Age										
39 years or younger	15.8	1.7	7.4	1.7	9.0	31.0	-0.2	11.5	0.0	15.9
40-49 years	8.2	-0.8	4.1	-0.4	7.3	12.6	-4.4	3.8	-3.9	9.0
50 years or older	7.2	0.8	3.7	-0.5	6.0	8.5	-1.3	3.7	-2.2	6.8

Table 8. Operating Profit Margin and Net Farm Income Profitability Measures, Quartile Values for 2016, Median Values for 2015, and 5-year Average, 2011-2015, of Median Values, North Dakota Farm Business Management Education Program Participants.

Farm Group	2016 Upper Quartile	2016 Lower Quartile	2016 Median	2015 Median	Average of 2011-2015 Medians	2016 Upper Quartile	2016 Lower Quartile	2016 Median	2015 Median	Average of 2011-2015 Medians
	Operating Profit Margin (%)					Net Farm Income ($)				
All Farms	23.4	2.5	14.1	1.3	16.0	171,686	13,887	82,178	18,982	109,324
Region										
Red River Valley	19.0	2.2	10.6	3.6	13.1	150,742	25,174	98,221	32,675	143,666
North Central	25.0	6.9	15.6	-1.2	17.1	193,928	29,788	95,890	12,166	111,065
South Central	25.5	5.7	16.5	1.3	14.7	212,552	19,547	83,349	18,228	105,464
West	19.1	-13.4	5.6	0.3	15.4	102,315	-18,656	27,949	17,154	74,771
Farm Enterprise										
Crop	24.3	7.0	16.3	0.8	15.2	196,976	39,408	109,408	20,748	133,869
Livestock	15.4	-31.4	-3.0	9.0	22.1	26,357	-18,741	2,864	18,999	51,119
Mixed	20.7	-3.6	9.8	-1.2	14.9	106,460	6,097	46,293	10,057	64,776
Farm Sales										
$249,999 or less	26.0	-14.9	9.8	1.9	16.6	48,558	-6,146	15,915	10,627	32,274
$250,000-$499,999	21.7	4.9	15.8	-0.3	15.1	109,317	22,402	78,082	20,537	80,339
$500,000-$999,999	25.0	6.0	15.1	0.7	15.6	224,937	46,361	129,648	32,111	143,211
$1,000,000 or more	22.1	5.7	13.0	1.8	16.3	455,234	109,519	219,593	58,329	296,920
Farm Size										
1,999 acres or less	23.3	0.9	14.1	1.8	15.3	109,488	9,941	56,584	17,246	75,289
2,000 acres or more	23.5	5.0	13.9	0.9	16.3	294,597	32,334	148,850	31,278	180,108
Cropland Tenure										
Full tenant	24.9	5.0	16.0	2.7	15.5	150,055	16,914	74,046	20,739	74,360
1-20 percent owned	23.7	6.0	14.6	0.1	14.8	249,954	57,240	133,492	23,041	163,352
21-40 percent owned	20.9	1.8	12.3	1.3	16.4	195,245	8,960	103,973	18,952	142,318
41 percent or more owned	23.1	0.3	12.5	0.5	17.2	137,572	5,862	64,261	10,847	90,280
Net Farm Income										
$49,999 or less	6.9	-16.6	2.6	-6.4	0.2	24,163	-26,687	1,991	-3,848	8,675
$50,000-$99,999	20.7	10.2	15.1	11.0	16.3	86,395	59,360	74,139	72,102	73,950
$100,000-$199,999	23.1	12.0	17.8	14.8	20.6	163,162	118,732	139,509	130,496	140,911
$200,000 or more	28.7	21.0	25.5	22.4	27.9	459,806	252,284	314,492	274,655	325,070
Debt-to-Asset Ratio										
0-40 percent	24.4	6.7	15.6	1.1	18.2	247,612	42,258	124,141	27,883	165,213
41-70 percent	21.7	2.5	12.8	3.3	15.3	146,189	13,197	74,473	22,400	95,297
71 percent or more	22.0	-9.0	9.8	-7.0	7.6	94,128	-13,122	18,759	-11,381	27,563
Farmer Age										
39 years or younger	25.5	5.1	16.7	4.7	18.2	127,487	15,758	64,261	22,357	74,822
40-49 years	23.2	-3.2	9.9	-1.2	14.9	191,202	-3,719	91,389	7,587	137,174
50 years or older	20.6	4.1	12.6	-1.9	14.7	190,395	18,076	106,126	15,386	132,620

Table 9. Repayment Capacity Measures, Quartile Values for 2016, Median Values for 2015, and 5-year Average, 2011-2015, of Median Values, North Dakota Farm Business Management Education Program Participants.

Farm Group	2016 Upper Quartile	2016 Lower Quartile	2016 Median	2015 Median	Average of 2011-2015 Medians	2016 Upper Quartile	2016 Lower Quartile	2016 Median	2015 Median	Average of 2011-2015 Medians
	Term Debt Coverage Ratio (%)					Term Debt and Capital Repayment Margins ($)				
All Farms	3.42	0.72	1.68	0.69	2.15	116,319	-17,056	35,318	-16,382	57,720
Region										
Red River Valley	2.58	0.76	1.58	0.92	2.38	99,312	-13,383	31,395	-9,047	77,395
North Central	4.00	0.96	2.03	0.55	2.02	139,865	-1,422	57,924	-30,268	43,400
South Central	4.19	0.74	2.03	0.73	2.40	153,086	-11,655	42,476	-15,591	64,406
West	2.52	0.12	1.16	0.69	1.96	44,944	-59,807	6,948	-12,728	46,014
Farm Enterprise										
Crop	4.30	1.07	2.07	0.65	2.24	155,444	5,983	60,699	-22,651	69,875
Livestock	1.94	0.06	0.54	1.09	2.21	17,920	-61,179	-12,199	2,747	32,890
Mixed	1.57	0.23	0.89	0.48	1.74	43,029	-50,684	-8,404	-33,250	27,263
Farm Sales										
$249,999 or less	4.37	0.29	1.53	1.00	2.02	33,207	-19,249	12,908	24	18,655
$250,000-$499,999	3.17	0.70	1.67	0.69	1.93	85,062	-24,680	28,251	-17,841	34,304
$500,000-$999,999	3.25	0.93	1.81	0.62	2.18	158,699	-9,120	73,432	-35,513	69,082
$1,000,000 or more	3.46	0.85	1.70	0.72	2.39	396,664	-19,955	134,099	-75,362	168,501
Farm Size										
1,999 acres or less	4.14	0.77	1.73	0.79	2.24	75,158	-10,023	23,690	-5,628	36,512
2,000 acres or more	3.29	0.68	1.57	0.60	2.12	232,018	-32,536	73,935	-49,835	87,607
Cropland Tenure										
Full tenant	14.57	1.22	2.81	0.92	2.80	108,720	5,125	41,887	-1,243	37,698
1-20 percent owned	4.26	0.98	2.04	0.69	2.19	172,637	-3,878	72,645	-39,862	74,673
21-40 percent owned	2.76	0.45	1.36	0.50	2.11	153,075	-47,496	31,476	-34,012	75,108
41 percent or more owned	2.07	0.54	1.21	0.67	1.90	91,791	-37,053	15,645	-27,779	45,282
Net Farm Income										
$49,999 or less	1.51	-0.02	0.54	0.26	0.64	10,622	-76,806	-28,344	-38,879	-25,274
$50,000-$99,999	2.96	0.97	1.54	1.01	1.93	57,222	-1,477	22,757	612	33,407
$100,000-$199,999	4.73	1.51	2.22	1.82	2.37	119,167	47,753	89,300	71,784	79,806
$200,000 or more	6.80	2.10	3.16	2.28	3.59	398,186	158,325	241,221	154,383	233,747
Debt-to-Asset Ratio										
0-40 percent	6.65	1.41	2.68	0.98	3.24	208,239	16,488	93,135	-778	106,845
41-70 percent	2.45	0.70	1.43	0.73	1.81	84,717	-24,840	21,357	-14,660	38,332
71 percent or more	1.85	0.17	0.81	0.00	0.72	37,008	-71,860	-12,553	-55,657	-18,733
Farmer Age										
39 years or younger	5.46	1.06	2.16	0.95	2.26	87,079	2,124	34,229	-1,497	37,464
40-49 years	2.85	0.45	1.17	0.62	2.07	157,106	-34,787	7,084	-32,737	65,439
50 years or older	3.04	0.67	1.56	0.59	2.12	144,126	-32,504	46,796	-36,506	65,264

Table 10. Asset Turnover and Operating Expense and Depreciation Expense Efficiency Measures (as a Percentage of Gross Farm Income), Quartile Values for 2016, Median Values for 2015, and 5-year Average, 2011-2015, of Median Values, North Dakota Farm Business Management Education Program Participants.

	2016				Average of	2016				Average of	2016				Average of
Farm Group	Upper Quartile	Lower Quartile	Median	2015 Median	2011-2015 Medians	Upper Quartile	Lower Quartile	Median	2015 Median	2011-2015 Medians	Upper Quartile	Lower Quartile	Median	2015 Median	2011-2015 Medians
	Asset Turnover					Operating Expense (%)					Depreciation Expense (%)				
All Farms	.53	.24	.33	.30	0.39	60.4	80.5	69.2	80.2	69.0	5.1	11.1	7.8	8.8	6.2
Region															
Red River Valley	.56	.28	.38	.36	0.45	64.5	82.4	73.1	79.3	71.6	5.7	10.6	7.7	8.8	7.1
North Central	.61	.26	.35	.30	0.39	58.3	76.1	67.3	81.1	67.8	4.7	12.1	7.9	9.1	5.5
South Central	.44	.22	.31	.27	0.37	59.3	80.1	68.3	81.3	68.4	4.1	10.3	7.4	8.7	6.8
West	.43	.19	.28	.28	0.35	64.3	88.4	71.5	76.4	68.0	6.0	11.8	8.5	8.0	5.7
Farm Enterprise															
Crop	.59	.29	.38	.34	0.43	60.1	77.2	68.7	81.3	69.8	5.3	11.3	7.9	9.6	6.7
Livestock	.24	.12	.18	.22	0.28	61.4	95.6	76.2	71.0	61.9	4.7	10.7	7.4	6.0	4.8
Mixed	.34	.21	.28	.27	0.32	63.7	88.4	74.9	83.2	70.1	5.4	10.1	7.9	8.2	5.7
Farm Sales															
$249,999 or less	.58	.16	.28	.28	0.31	57.0	85.9	67.2	76.3	63.8	2.6	10.3	6.4	6.1	4.7
$250,000-$499,999	.49	.22	.33	.30	0.41	62.8	80.5	69.2	81.7	70.3	4.7	11.5	7.5	8.6	5.4
$500,000-$999,999	.52	.26	.34	.30	0.39	59.7	76.5	69.4	80.5	69.5	6.1	11.9	8.4	9.6	6.6
$1,000,000 or more	.53	.29	.36	.30	0.41	62.7	81.4	72.0	82.4	70.6	6.3	10.6	8.4	10.9	7.5
Farm Size															
1,999 acres or less	.57	.22	.34	.31	0.41	60.1	80.5	69.2	79.2	68.4	3.8	10.7	6.7	7.4	5.6
2,000 acres or more	.47	.26	.33	.29	0.37	61.0	80.4	69.3	81.6	69.7	6.4	11.4	8.6	10.2	6.8
Cropland Tenure															
Full tenant	1.06	.33	.63	.50	0.62	60.2	79.4	69.5	79.6	69.9	2.7	8.3	6.1	7.1	5.3
1-20 percent owned	.55	.35	.44	.37	0.46	61.2	77.8	69.2	83.2	71.5	5.5	10.4	7.8	9.6	6.5
21-40 percent owned	.38	.27	.32	.30	0.38	62.3	82.4	73.1	81.4	69.1	6.6	11.6	8.6	10.1	6.8
41 percent or more owned	.29	.18	.23	.22	0.29	59.1	80.2	68.1	77.2	66.1	5.9	12.7	9.1	9.6	6.6
Net Farm Income															
$49,999 or less	.38	.16	.26	.29	0.31	72.9	92.8	83.0	86.3	81.6	5.3	11.9	8.0	9.5	6.7
$50,000-$99,999	.57	.27	.35	.30	0.36	62.2	73.6	68.8	72.7	68.0	4.0	11.0	6.6	8.1	5.6
$100,000-$199,999	.59	.27	.38	.38	0.42	59.4	72.7	67.6	70.7	66.1	4.9	11.5	7.8	7.7	5.4
$200,000 or more	.56	.30	.41	.36	0.42	56.9	64.9	60.3	65.0	59.6	6.0	10.0	7.8	8.3	6.2
Debt-to-Asset Ratio															
0-40 percent	.43	.24	.31	.26	0.36	59.4	74.2	66.5	78.2	65.9	6.6	12.7	9.5	10.9	7.2
41-70 percent	.61	.25	.36	.34	0.42	62.4	81.3	71.1	78.2	70.5	4.6	9.5	6.9	7.7	5.7
71 percent or more	.54	.22	.37	.33	0.38	61.7	89.1	74.3	87.5	76.8	3.8	9.8	6.7	7.6	4.9
Farmer Age															
39 years or younger	.77	.26	.44	.38	0.48	58.5	78.0	67.6	76.8	67.1	3.0	8.1	5.9	6.7	4.7
40-49 years	.51	.26	.34	.33	0.43	61.8	85.6	75.1	83.9	71.3	5.8	11.2	8.0	9.5	6.6
50 years or older	.39	.23	.30	.26	0.34	62.6	80.0	69.2	82.5	69.6	6.9	12.3	9.3	10.6	7.3

Table 11. Interest Expense and Farm Income Efficiency Measures (as a Percentage of Gross Farm Income), Quartile Values for 2016, Median Values for 2015, and 5-year Average, 2011-2015, of Median Values, North Dakota Farm Business Management Education Program Participants.

Farm Group	2016 Upper Quartile	2016 Lower Quartile	2016 Median	2015 Median	Average of 2011-2015 Medians	2016 Upper Quartile	2016 Lower Quartile	2016 Median	2015 Median	Average of 2011-2015 Medians
	Interest Expense (%)					Net Farm Income (%)				
All Farms	2.0	7.0	4.0	4.3	3.5	26.7	4.5	17.7	5.1	20.0
Region										
Red River Valley	1.4	5.5	3.2	3.8	3.0	23.3	4.7	14.9	6.9	17.4
North Central	1.9	6.6	3.8	4.3	3.5	29.8	9.9	20.4	4.4	22.3
South Central	2.3	7.3	4.5	4.5	3.5	27.6	5.8	18.9	4.9	20.2
West	3.1	11.7	6.4	6.2	5.1	24.5	-10.8	9.9	5.0	18.3
Farm Enterprise										
Crop	1.8	5.8	3.3	3.8	3.1	27.7	10.0	20.0	4.7	19.5
Livestock	4.4	13.0	8.3	5.8	4.9	25.0	-17.8	3.1	15.5	26.0
Mixed	4.4	9.3	5.3	5.9	4.7	22.8	2.3	10.7	1.9	17.7
Farm Sales										
$249,999 or less	2.1	11.4	5.4	5.3	4.6	32.3	-6.8	18.7	8.5	25.0
$250,000-$499,999	2.2	7.4	4.4	4.7	3.8	25.3	6.3	19.5	5.7	20.4
$500,000-$999,999	2.0	6.3	3.7	4.2	3.6	26.7	7.0	17.5	4.4	19.4
$1,000,000 or more	1.9	5.6	3.5	3.6	2.9	23.9	5.4	13.9	3.3	18.3
Farm Size										
1,999 acres or less	1.9	7.2	3.8	4.2	3.4	27.4	4.5	19.1	6.9	20.8
2,000 acres or more	2.5	6.7	4.2	4.5	3.6	26.1	4.5	15.3	3.0	19.0
Cropland Tenure										
Full tenant	1.2	4.7	2.5	3.0	2.4	29.3	10.9	22.5	9.5	22.1
1-20 percent owned	1.9	5.4	3.7	3.9	3.1	27.8	7.9	19.4	2.9	18.2
21-40 percent owned	2.8	7.9	4.6	4.7	3.9	23.7	1.3	13.2	4.3	19.4
41 percent or more owned	3.3	9.5	5.2	6.4	4.9	24.9	2.1	15.8	4.2	21.2
Net Farm Income										
$49,999 or less	3.1	11.1	6.6	5.4	5.4	11.1	-12.1	0.8	-1.3	4.5
$50,000-$99,999	2.3	6.4	4.2	3.9	3.9	26.2	12.3	18.1	14.9	21.4
$100,000-$199,999	1.9	4.9	3.2	2.9	3.1	26.0	14.7	21.1	18.7	25.0
$200,000 or more	1.1	4.4	2.9	3.2	2.5	32.8	22.4	28.2	25.0	30.9
Debt-to-Asset Ratio										
0-40 percent	0.9	3.5	2.2	2.3	1.9	28.7	11.4	21.4	6.9	24.1
41-70 percent	3.0	7.8	5.0	5.7	4.9	25.0	4.3	14.0	6.3	17.9
71 percent or more	5.4	12.5	8.2	7.7	6.8	24.3	-9.3	10.4	-6.1	9.4
Farmer Age										
39 years or younger	2.0	7.0	3.8	4.5	3.8	30.5	10.9	21.8	9.6	23.1
40-49 years	2.7	7.3	4.6	5.1	3.7	24.0	-1.0	11.7	2.5	18.5
50 years or older	1.9	6.8	4.0	4.0	3.3	25.2	2.9	15.9	2.3	18.7

Appendix

DEFINITION OF FINANCIAL MEASURES

Sixteen measures of financial performance were calculated for each farm in this study. The recommendations of the Farm Financial Standards Council for calculating the ratios were followed as closely as possible, from the Finpack data.

The Farm Financial Standards Council stated that a more meaningful comparison between farms is achieved with market valuation of assets, but due to fluctuations in market values the cost method (acquisition cost less accumulated depreciation) is superior for comparisons over time for an individual farm operation. In fact, a dual column balance sheet is recommended: one column to value assets by the cost approach and a second column for market valuation of assets.

The valuation method used for current assets of farms in this study depended on what was most relevant and reliable. For example, current market value was used for grain and market livestock inventories, but prepaid expenses and supplies were listed at purchase cost.

Non-current asset valuation was:

- Machinery was valued at cost minus accumulated depreciation. Annual depreciation was 10 percent of un-depreciated value.

- Purchased breeding livestock was valued at cost. Raised replacement animals were valued at a conservative market value when they enter the breeding herd. This value remains constant until the animal leaves the herd.

- Generally, land was valued at cost. However, when a farmer enrolls in the farm business program there may be a one-time revaluing of land to a conservative market value.

Assets and liabilities not associated with the farm business are excluded from the calculation of farm financial performance measures. Accrued liabilities were included on the balance sheets but deferred tax liabilities were not.

The calculations of all financial measures, unless otherwise noted, are accrual adjusted. Examples are:

- Gross farm revenue is gross cash revenue plus the changes in crop and market livestock inventories and accounts receivable.

- Interest expense is cash interest plus the change in accrued interest.

Liquidity

Current Ratio

Computation: Current assets divided by current liabilities.

Interpretation: This ratio measures the extent current assets will cover liabilities that are due during the next 12 months. The higher the ratio the more cushion the business has to meet short-run obligations without disrupting normal business operations. The current ratio's limitation as a measure of liquidity is that it does not match the timing of financial obligations with the liquidation of current assets, nor does it consider any new debt incurred or assets that may be generated during the 12 months after the balance sheet date.

Working Capital

Computation: Current assets minus current liabilities.

Interpretation: This measure shows the dollar amount that current assets can or cannot cover current liabilities. The amount of working capital necessary to provide an adequate cushion for meeting debt obligations must be related to the size of the business. Working capital as a measure of liquidity has similar limitations as the current ratio.

Solvency

Debt-to-Asset

Computation: Total liabilities divided by total assets.

Interpretation: This ratio shows the proportion of assets owed to creditors. The lower the debt-to-asset ratio the higher the solvency of the business. Solvency is a measure of risk exposure. As solvency decreases, the owner has less equity relative to debt, the ability to procure additional financing may decrease, and the business's ability to survive adverse outcomes is diminished. However, solvency should be viewed in connection with profitability. A low solvency position may be desirable if debt capital provides returns in excess of its cost.

Equity-to-Asset

Computation: Owner equity divided by total assets.

Interpretation: This ratio shows the portion of total assets represented by owner equity. It is another way of expressing solvency.

Debt-to-Equity

Computation: Total liabilities divided by owner equity.

Interpretation: This ratio shows the extent to which debt capital is combined with equity capital. It is another way of expressing solvency.

Profitability

Rate of Return on Assets (ROA)

Computation: Net farm income plus interest expense minus a charge for unpaid operator labor and management, divided by average total assets.

Interpretation: This ratio measures the pre-tax rate of return on farm assets and is used to evaluate whether assets are employed profitability in the business. Two important factors affecting this measure are valuation of assets and the charge for unpaid operator labor and management. Five percent of gross revenue plus a $20,000 charge per full time operator was used.

Rate of Return on Equity (ROE)

Computation: Net farm income minus a charge for unpaid operator labor and management, divided by average owner equity.

Interpretation: This ratio measures the pre-tax rate of return on equity capital employed in the business. Two important factors affecting this measure are valuation of assets and the charge for unpaid operator labor and management. Five percent of gross revenue plus a $20,000 charge per full time operator was used. This ratio should be evaluated carefully and used in conjunction with other ratios when analyzing a farm business. If ROE is greater than ROA, debt capital is being employed profitably—it is earning more

than it costs in interest. A high ratio may indicate an undercapitalized or highly leveraged business, and a low ratio may indicate a more conservative, high equity business.

Operating Profit Margin

Computation: Net farm income plus interest expense minus a charge for unpaid operator labor and management, divided by the value of farm production. Value of farm production is gross farm revenue less purchase of market livestock and feed.

Interpretation: This ratio measures net farm income per dollar of farm production. It is a pre-tax measure of profit margin from the employment of assets. An important factor is the charge for unpaid operator labor and management. There is a relationship between operating profit margin, asset turnover rate, and ROA. Operating profit margin multiplied by asset turnover rate equals ROA.

Net Farm Income

Computation: Net farm income is total revenue earned minus the costs incurred to generate those revenues. It is cash revenue less cash expense and depreciation plus capital adjustments (gain or loss from sale of capital assets). Accrual adjustments for changes in inventories are included to properly match revenues and expenses to the time period for which net farm income is being measured.

Interpretation: Net farm income is the return to the operator for unpaid labor and management and equity capital used in the farm business. Net farm income is an absolute amount and it is difficult to assign a standard to all farms because of differences in the amount of unpaid operator labor and equity used.

Repayment Capacity

Term Debt Coverage Ratio

Calculation: Net farm income plus depreciation and other capital adjustments plus non-farm income plus scheduled interest on term debt minus family living expense and income taxes, divided by scheduled term debt principal and interest payments.

Interpretation: This ratio measures the capacity of the borrower to cover all term debt payments. The more the ratio exceeds 1, the greater the margin to cover term debt payments. The business may have sufficient earnings but the timing of cash flows may not be adequate to make the payments on a timely basis. Also, the ratio does not contain any provision for replacement of capital assets.

Capital Replacement and Term Debt Repayment Margin

Calculation: Net farm income plus depreciation and other capital adjustments plus non-farm income minus family living expense, income taxes, and scheduled term debt principal payments.

Interpretation: This is a measure of the business' ability to make payments on term debt. A positive margin indicates the amount available, after making term debt payments, for acquiring capital assets or servicing additional debt. The capital replacement and term debt repayment margin is a dollar amount, so it is impossible to establish a standard for all farm businesses.

Financial Efficiency

Asset Turnover

Calculation: Value of farm production divided by average total assets. Value of farm production is gross farm revenue less purchase of market livestock and feed.

Interpretation: This is a measure of how efficiently assets are used in the business. The higher the number, the more production is created per dollar of assets. Asset turnover can vary significantly by type of farm and by asset base. For example, dairy and hog farms will typically have higher asset turnovers than cow-calf or cash grain operations. Asset turnover will probably be higher if capital assets, such as machinery and land, are rented instead of owned.

Operating Expense Ratio

Calculation: Total expense less interest and depreciation and capital adjustment divided by gross farm revenue.

Interpretation: This ratio measures how efficiently operating expenses are managed to generate gross farm revenue. The operating expense ratio will typically vary by farm type.

Depreciation Expense Ratio

Calculation: Depreciation and capital adjustments divided by gross farm revenue.

Interpretation: This ratio expresses depreciation and capital adjustment relative to gross farm revenue. It will vary by farm type and from year to year. Caution must be used when evaluating this ratio. It does not comply with the farm financial standards because the Finpack program, used to generate the farm financial summaries, calculates depreciation and capital adjustment as one number (ending inventory plus capital sales less the sum of beginning inventory and capital purchases). Therefore depreciation cannot be isolated.

Interest Expense Ratio

Calculation: Interest expense divided by gross farm revenue.

Interpretation: This ratio shows the portion of gross farm revenue necessary to cover interest expense. It is often used as a measure of financial risk.

Net Farm Income Ratio

Calculation: Net farm income divided by gross farm revenue.

Interpretation: This is a measure of how efficient the farm business is at generating net income from gross revenue. It is the portion of gross farm revenue left after operating expense, depreciation and capital adjustment, and interest expense have been removed.

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