

Farmers who have a large investment in land, machinery, livestock, and equipment need to keep informed about the financial condition of their operations. Some useful measures of financial performance can be calculated from information found in most farm record books and accounting programs. These measures can help farmers assess the profitability, debt capacity, and financial risk currently faced by their businesses. The measures presented in this publication are based on guidelines of the [Farm Financial Standards Council](http://www.ffsc.org), www.ffsc.org, and are used by most agricultural lenders and farm accountants.

Types of Measures

Five different areas of financial condition are measured. **Liquidity** refers to the degree to which debt obligations coming due can be paid from cash or assets that soon will be turned into cash. This is measured by the current ratio, the amount of working capital, and the amount of working capital per dollar of gross revenue. A more thorough analysis of liquidity can be made with a cash flow budget. FM1792, AgDM File C3-15: [Twelve Steps to Cash Flow Budgeting](http://store.extension.iastate.edu/Product/1815.pdf), store.extension.iastate.edu/Product/1815.pdf, explains this tool in detail.

Solvency refers to the degree to which all debts are secured and the relative mix of equity and debt capital used by the farm. The total debt-to-asset ratio is one of several ratios used to measure solvency, all of which are based on the same relationship of assets, liabilities, and net worth.

Profitability refers to the difference between income and expenses. One important measure of profitability is net farm income. Annual rates of return on both equity capital and total assets also can be calculated and compared to interest rates for loans or rates of return from alternative investments.

Financial efficiency ratios show what percent of gross farm revenue went to pay interest, operating expenses, and depreciation, and how much was left for net farm income. The asset turnover ratio measures how much gross income was generated for each dollar invested in land, livestock, equipment, and other assets.

Repayment capacity measures show the degree to which cash generated from the farm and other sources will be sufficient to pay principal and interest payments as they come due.

Using Performance Measures

Values for the farm financial measures should be calculated for several years to observe trends and to avoid making judgments based on an unusual year. Typical historical values for most of these measures can be found in the tables at the end of this publication. They are based on data obtained from the Iowa Farm Business Association (IFBA). Values will vary according to the major enterprises carried out, farm size, location, and the type of land tenure. Other comparable data can be found in the annual publication FM1789, AgDM File C1-10: [Iowa Farm Costs and Returns](http://store.extension.iastate.edu/Product/1812.pdf), store.extension.iastate.edu/Product/1812.pdf.

Liquidity

Farms with good liquidity typically have **current ratios** of at least 3.0 or higher. Dairy farms or other farms that have continuous sales throughout the year can safely operate with a current ratio as low as 2.0, however. Conversely, operations that concentrate sales during several periods each year, such as cash grain farms, need to strive for a current ratio higher than 3.0, especially near the beginning of the year.

The amount of **working capital** needed depends on the size of the operation. Records show that working capital measured at the beginning of the year is typically equal to about 50-70% of the farm's annual gross revenue. For dairy farms, working capital can be as low as 30% of gross revenue, but cash grain farms may need as much as 50%.

Solvency

Total **debt-to-asset ratios** tend to be higher for larger farms and for farms that specialize in livestock feeding. Ratios of 10-30% are common among Iowa farms, although many operate with little or no debt. A high debt load does not make farms less efficient, but principal and interest payments eat into cash flow. High-efficiency farms are able to service a higher debt load safely.

Two other ratios are commonly used to measure solvency. The **equity-to-asset ratio** shows how many dollars of net worth a farm has for every dollar of assets. It is equal to 100% minus the debt-to-asset ratio. Higher equity-to-asset ratios indicate a less risky financial situation. Some lenders prefer to use the **debt-to-equity ratio** to measure solvency. Higher ratios indicate more risk.

Another useful measure is how much net worth the farm has for each crop acre farmed, especially for cash grain farms. The IFBA average is nearly \$2,500.

Profitability

Net farm income from operations is what is left from all income received from the farm business in the past year, minus all the operating expenses used to generate this income. Note that operating expenses do not include the cost of financing the business, which is interest expense.

Net farm income, or what is left after subtracting interest, is highly variable from year to year and is closely tied to the size and efficiency of the operation. It also depends on the amount of debt the farm is carrying. The **rate of return on farm assets** is quite variable, too, but average long-term rates of 6-10% have been common in Iowa. High-profit farms may average more than 12%, while low-profit farms often realize a return of only 2% or less.

The average **rate of return on farm equity** measures how fast farm net worth is growing. Highly leveraged farms may earn little or no return on equity when interest rates are high. On the other hand, if the farm's overall return on assets is higher than the cost of borrowed money, the return on equity may be quite high and net worth will grow rapidly.

Operating profit margin is equal to the dollar return to capital divided by the value of farm production each year. Ratios have averaged about 6-10% in recent years, and 25-30% in the 2000s. High-profit farms have had ratios of 30% or more, while low-profit farms have had ratios of less than 10%. Farms that hire or rent assets such as labor, land, or machinery usually will have a lower operating profit margin because operating costs are higher. However, they will also generate a larger gross and net income. Farms with owned or crop share rented land will have a higher operating profit margin because they have lower operating expenses.

Another common measure of profitability is **Earnings Before Interest, Taxes, Depreciation, and Amortization**, abbreviated as EBITDA. It shows how many dollars are available for debt repayment.

Financial Efficiency

Asset turnover ratios for typical farms are about 20-30%, but they can range from 10-20% for low-profit farms and up to 30-50% for high-profit farms. The asset turnover ratio measures the efficient use of investment capital to generate revenue while the operating profit margin ratio measures the efficient use of operating capital. Because they are substitutes for each other (owned and rented land, for example), farms that are high in one measure may be low in the other.

Farms with mostly rented land should have higher asset turnover ratios than farms with mostly owned land, generally around 50%. Rented farms also will have higher **operating expense ratios** because rent paid is included in operating expenses. Likewise, rented farms will tend to have lower **depreciation** and **interest expense ratios** than owned farms. Typically, about 60-70% of gross revenue goes for operating expenses, 5-10% goes for depreciation, and under 5% goes for interest.

The average **net farm income ratio** for Iowa farms has been in the 5-15% range in recent years but used to be in the 20-30% range in the 2000s. High-profit farms have averaged from 30-40% and low-profit farms less than 15%.

Repayment Capacity

The farm record data that was available did not contain enough information to calculate historical repayment capacity measures. However, the **capital debt repayment margin** should be large enough to cover any possible shortfalls in cash flow that cannot be paid from savings or other sources of short-term liquidity. This measure includes nonfarm income and expenses, so does not measure business performance.

If comparisons show that a farm's financial performance is below average, further analysis should be done to determine the sources of the problem. Areas of possible concern are production efficiency, marketing, purchasing of inputs, and the scale of the operation in relation to the size of the workforce. Enterprise analysis and production records can help identify problems that contribute

to poor financial performance. Details can be found in AgDM File C3-53: [Financial Troubleshooting](http://www.extension.iastate.edu/agdm/wholefarm/pdf/c3-53.pdf), www.extension.iastate.edu/agdm/wholefarm/pdf/c3-53.pdf.

Calculating these financial performance measures for several years will reveal a great deal about the financial health of a farm business. Particular attention should be paid to any trends that are developing. Any decisions about investments or borrowing, however, also should consider current and future economic conditions, availability of collateral, and the experience and character of the farm operator.

Information Needed

The worksheet at the end of this publication shows the basic information needed to compute the financial measures. **Asset** and **liability values** should be recorded as close to the beginning and ending of the accounting year as possible. Include only **farm** assets, liabilities, and any property or investment that generates returns included in farm income.

For calculating the financial performance ratios, farm assets should be valued at their current fair market value, minus any potential selling costs and income tax payments.

Scheduled principal payments on term debt include principal that was paid during the past year on intermediate and long-term farm loans. These can be found in the current liabilities section of

the beginning of the year net worth statement. Also include any long-term lease payments for machinery and equipment (but not land) that came due.

Gross farm revenue refers to total farm sales and miscellaneous farm income. Cash income should be adjusted to reflect changes in inventories of crops, livestock, and accounts receivable. Gross farm revenue does not include nonfarm income, loan funds received, nor income from sales of machinery, equipment, and real estate.

Net farm income from operations is the difference between gross revenue and total farm expenses, including interest and depreciation.

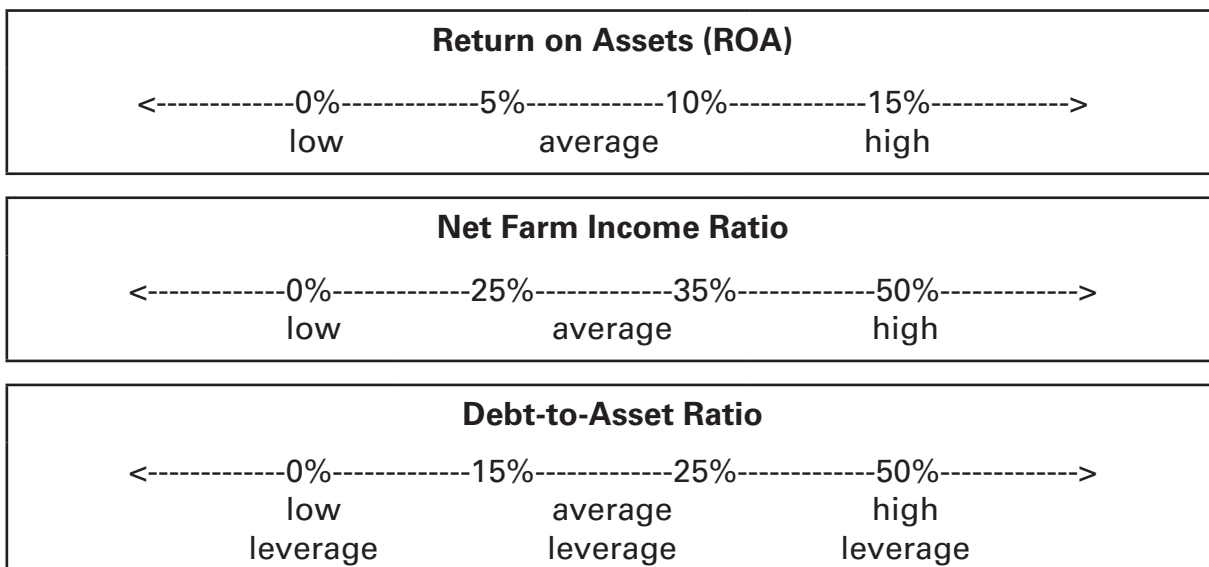
Depreciation expense should be the same value as used on the farm income statement.

Interest expense is equal to the cash interest paid plus or minus the change in the amount of accrued interest owed at the end of the year.

Farm capital gains and losses is the difference between the selling price of any depreciable asset sold during the year and its adjusted basis (depreciated value).

Nonfarm income, family living expenses, and income tax payments can be estimated from personal records. Common farm wage rates in the community can be used to value **unpaid labor** and **management**.

Comparison of Values for Key Ratios



Farm Financial Measures Worksheet

Information needed

The following items can be taken from the farm’s beginning and ending net worth statements (balance sheets), using the fair market value. For items C, D and H, find the average of the beginning and ending values.

	Beginning	Ending	Average
A. Current farm assets	_____	_____	
B. Current farm liabilities	_____	_____	
C. Total farm assets (market)	_____	_____	_____
D. Total farm liabilities	_____	_____	_____
E. Farm net worth (market) (C – D)	_____	_____	_____
F. Accrued interest	_____	_____	
G. Scheduled principal payments on farm fixed liabilities paid in the past 12 months	_____		
H. Machinery and equipment value	_____	_____	_____

The following items can be taken from the latest net income (profit and loss) statement and/or income tax records. If an accrual accounting net income statement is not available, one can be developed using publication FM 1824, AgDM C3-56: [Farm Financial Statements](http://store.extension.iastate.edu/Product/1827.pdf), store.extension.iastate.edu/Product/1827.pdf.

I. Feed purchased \$_____ + livestock purchased \$_____	_____
J. Gross farm revenue (accrual)	_____
K. Net farm income from operations (accrual) (excluding capital gains and losses)	_____
L. Farm interest expense (cash interest paid \$_____ – beginning F + ending F)	_____
M. Farm depreciation expense	_____
N. Nonfarm income invested in the farm business	_____
O. Cash withdrawn from the farm for family living, taxes, savings, etc.	_____
P. Value of operator and unpaid family labor and management	_____

The following item can be taken from crop production records.

Q. Total crop acres farmed (owned, rented, custom farmed)	_____
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Financial Performance Measures

	Your farm	Comparison
Liquidity measures		
1. Ending current ratio [A / B]		
2. Ending working capital [A – B]	\$	\$
3. Working capital to gross revenue [line 2 / J]		
Solvency measures		
4. Ending total debt-to-asset ratio [D / C]	%	%
5. Ending equity-to-asset ratio [E / C]	%	%
6. Ending debt-to-equity ratio [D / E]	%	%
7. Net worth per crop acre [E / Q]	\$	\$
Profitability measures		
8. Net farm income from operations [K]	\$	\$
9. Rate of return on farm assets (ROA) [(K – P) / average C]	%	%
10. Rate of return on farm equity (ROE) [(K – L – P) / average E]	%	%
11. Operating profit margin ratio [(K – P) / (J – I)]	%	%
12. EBITDA [K + M]	\$	\$
Financial efficiency ratios		
13. Asset turnover ratio [(J – I) / average C]	%	%
14. Machinery investment per crop acre [average H / Q]	\$	\$
15. Operating expense ratio [(J – K – M) / J]	%	%
16. Depreciation expense ratio [M / J]	%	%
17. Interest expense ratio [L / J]	%	%
18. Net farm income ratio [(K – L) / J] (Sum of lines 15, 16, 17, 18 should be 100%)	%	%
Repayment capacity measure		
19. Capital debt repayment margin [K – L + M + N – O – G]	\$	\$

See an example for *Cyclone Farms* on the following pages.

Farm Financial Measures Cyclone Farms Example

Information needed

The following items can be taken from the farm's beginning and ending net worth statements (balance sheets), using the fair market value. For items C, D and H, find the average of the beginning and ending values.

	Beginning	Ending	Average
A. Current farm assets	<u>\$955,328</u>	<u>\$904,702</u>	
B. Current farm liabilities	<u>507,514</u>	<u>397,963</u>	
C. Total farm assets (market)	<u>2,736,909</u>	<u>2,822,663</u>	<u>\$2,779,786</u>
D. Total farm liabilities	<u>916,847</u>	<u>835,736</u>	<u>876,291</u>
E. Farm net worth (market) (C - D)	<u>1,820,062</u>	<u>1,986,927</u>	<u>1,903,494</u>
F. Accrued interest	<u>23,725</u>	<u>22,484</u>	
G. Scheduled principal payments on farm fixed liabilities paid in the past 12 months	<u>28,440</u>		
H. Machinery and equipment value	<u>250,000</u>	<u>275,000</u>	<u>262,500</u>

The following items can be taken from the latest net income (profit and loss) statement and/or income tax records. If an accrual accounting net income statement is not available, one can be developed using publication FM 1824/AgDM C3-56, Farm Financial Statements, <https://store.extension.iastate.edu/Product/1827.pdf>.

I. Feed purchased <u>\$179,150</u> + livestock purchased <u>\$132,500</u>	<u>\$311,650</u>
J. Gross farm revenue (accrual)	<u>900,068</u>
K. Net farm income from operations (accrual) (excluding capital gains and losses)	<u>91,916</u>
L. Farm interest expense (cash interest paid <u>\$25,442</u> - beginning F + ending F)	<u>24,201</u>
M. Farm depreciation expense	<u>53,150</u>
N. Nonfarm income invested in the farm business	<u>0</u>
O. Cash withdrawn from the farm for family living, taxes, savings, etc.	<u>69,000</u>
P. Value of operator and unpaid family labor and management	<u>50,000</u>

The following item can be taken from crop production records.

Q. Total crop acres farmed (owned, rented, custom farmed)	<u>500</u>
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Financial Performance Measures Cyclone Farms Example

	Your farm	Comparison
Liquidity measures		
1. Ending current ratio [A / B]	2.27	
2. Ending working capital [A – B]	\$ 506,739	\$
3. Working capital to gross revenue [line 2 / J]	0.56	
Solvency measures		
4. Ending total debt-to-asset ratio [D / C]	29.6 %	%
5. Ending equity-to-asset ratio [E / C]	70.4 %	%
6. Ending debt-to-equity ratio [D / E]	42.1 %	%
7. Net worth per crop acre [E / Q]	\$ 3,974	\$
Profitability measures		
8. Net farm income from operations [K]	\$ 91,916	\$
9. Rate of return on farm assets (ROA) [(K – P) / average C]	1.5 %	%
10. Rate of return on farm equity (ROE) [(K – L – P) / average E]	0.9 %	%
11. Operating profit margin ratio [(K – P) / (J – I)]	7.1 %	%
12. EBITDA [K + M]	\$ 145,066	\$
Financial efficiency ratios		
13. Asset turnover ratio [(J – I) / average C]	21 %	%
14. Machinery investment per crop acre [average H / Q]	\$ 525	\$
15. Operating expense ratio [(J – K – M) / J]	83.9 %	%
16. Depreciation expense ratio [M / J]	5.9 %	%
17. Interest expense ratio [L / J]	2.7 %	%
18. Net farm income ratio [(K – L) / J] (Sum of lines 15, 16, 17, 18 should be 100%)	7.5 %	%
Repayment capacity measure		
19. Capital debt repayment margin [K – L + M + N – O – G]	\$ 23,425	\$

Five-Year Trend Worksheet for Farm Financial Measures

Year	_____	_____	_____	_____	_____
Liquidity					
Ending current ratio	_____	_____	_____	_____	_____
Ending working capital	_____	_____	_____	_____	_____
Working capital per \$ of gross revenue	_____	_____	_____	_____	_____
Solvency					
Ending total debt-to-asset ratio (or equity/asset, or debt/equity)	_____	_____	_____	_____	_____
Ending net worth	_____	_____	_____	_____	_____
Net worth per crop acre	_____	_____	_____	_____	_____
Profitability					
Net farm income from operations	_____	_____	_____	_____	_____
Rate of return on farm assets	_____	_____	_____	_____	_____
Rate of return on farm equity	_____	_____	_____	_____	_____
Operating profit margin ratio Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA)	_____	_____	_____	_____	_____
Financial efficiency					
Asset turnover ratio	_____	_____	_____	_____	_____
Machinery investment per crop acre	_____	_____	_____	_____	_____
Operating expense ratio	_____	_____	_____	_____	_____
Depreciation expense ratio	_____	_____	_____	_____	_____
Interest expense ratio	_____	_____	_____	_____	_____
Net farm income ratio	_____	_____	_____	_____	_____
Repayment capacity					
Capital debt repayment margin	_____	_____	_____	_____	_____

Farm Financial Measures by Year

	2011	2012 ^{1/}	2013	2014	2015	2016	2017 ^{2/}	2018	2019	2020
Liquidity Measures (Dec. 31)										
Current ratio	5.51	7.08	4.92	3.52	3.32	3.30	2.77	3.14	2.69	3.06
Working capital	\$235,242	\$518,567	\$453,995	\$437,274	\$398,394	\$350,595	\$334,996	\$324,247	\$326,022	\$356,037
Working capital per \$ of gross revenue	\$0.43	\$0.75	\$0.78	\$0.69	\$0.63	\$0.60	\$0.56	\$0.56	\$0.52	\$0.53
Solvency Measure (Dec. 31)										
Total debt-to-asset ratio	16%	16%	17%	19%	21%	22%	24%	24%	25%	25%
Net worth per acre farmed	\$2,681	\$2,765	\$2,881	\$2,805	\$2,897	\$2,872	\$2,918	\$2,870	\$2,961	\$3,192
Profitability Measures										
Net farm income	\$187,340	\$243,072	\$71,595	\$99,177	\$27,927	\$45,597	\$55,266	\$58,832	\$77,946	\$132,339
Rate of return on farm assets	10.6%	10.6%	2.2%	2.5%	1.1%	1.7%	1.5%	2.2%	2.7%	4.5%
Rate of return on farm equity	11.8%	11.8%	1.8%	2.4%	0.2%	1.0%	0.8%	1.4%	2.1%	4.6%
Operating profit margin ratio	33%	35%	9%	9%	5%	8%	6%	10%	12%	19%
Financial Efficiency Measures										
Operating expense ratio	56%	58%	76%	77%	80%	77%	79%	76%	75%	70%
Depreciation expense ratio	6%	6%	9%	9%	10%	9%	10%	9%	9%	8%
Interest expense ratio	2%	2%	3%	3%	3%	4%	4%	5%	5%	4%
Net farm income ratio	<u>36%</u>	<u>34%</u>	<u>12%</u>	<u>11%</u>	<u>8%</u>	<u>10%</u>	<u>7%</u>	<u>10%</u>	<u>11%</u>	<u>18%</u>
Asset turnover ratio	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Machinery investment per acre	\$352	\$462	\$475	\$504	\$502	\$486	\$474	\$481	\$497	\$515

Source: FM 1789, AgDM C1-10: [Iowa Farm Costs and Returns](http://www.extension.iastate.edu/agdm/wholefarm/pdf/c1-10.pdf), www.extension.iastate.edu/agdm/wholefarm/pdf/c1-10.pdf; Iowa Farm Business Association

^{1/} Revised using weights from the 2012 Census of Agriculture.

^{2/} Revised using weights from the 2017 Census of Agriculture.

Farm Financial Measures by Profitability (2011-2020 Average)

	Profitability (Return to Management)		
	Average of All Farms	High-Profit Third	Low-Profit Third
Liquidity Measures (Dec. 31)			
Current ratio	3.93		
Working capital	\$373,537		
Working capital per \$ gross revenue	\$0.60		
Solvency Measure (Dec. 31)			
Total debt-to-asset ratio	21%	29%	23%
Net worth per acre farmed	\$2,884		
Profitability Measures			
Net farm income	\$99,909	\$272,823	-\$286
Rate of return on farm assets	4.0%	9.4%	0.8%
Rate of return on farm equity	3.8%	11.2%	-0.3%
Operating profit margin ratio	14%	27%	3%
Financial Efficiency Measures			
Operating expense ratio	72%	70%	84%
Depreciation expense ratio	9%	6%	9%
Interest expense ratio	4%	3%	4%
Net farm income ratio	<u>16%</u>	<u>21%</u>	<u>3%</u>
	100%	100%	100%
Asset turnover ratio	24%	34%	20%
Machinery investment per crop acre	\$475	\$418	\$558

Source: FM 1789, AgDM C1-10: [Iowa Farm Costs and Returns](http://www.extension.iastate.edu/agdm/wholefarm/pdf/c1-10.pdf), www.extension.iastate.edu/agdm/wholefarm/pdf/c1-10.pdf; Iowa Farm Business Association

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