

Farm Financial Analysis Series: Ratios to Measure Farm Financial Health

Financial statements are essential tools for managing farm businesses. Often, an accountant or bookkeeper will produce financial statements from the business's financial records. Although the manager and/or owner may not be the person who develops the statements, they should understand the information these statements provide about the business's financial condition and how to improve poor financial performance.

This publication is part of the Farm Financial Analysis Series. Other publications in this series include [P3709 *Managing Farm Finances in Turbulent Times*](#), [P3713 *Balance Sheet*](#), [P3710 *Cash Flow Statement*](#), and [P3707 *Income Statement*](#). To ensure you get a full picture of your farm's financial situation, be sure to use all five publications in the series.

The financial health of a farm business can be determined by using a series of ratios, which provide insight for solving financial problem areas. These ratios allow for comparisons of the farm's current situation to benchmarks, other farms, or historical farm information to show where improvements can be made. In this publication, we will describe a few key ratios and explain how to use them to determine financial stability. Table 1 shows the full list of ratios.

Table 2 shows an example of how these ratios are calculated using values from the example balance sheet, cash flow statement, and income statement in the Farm Financial Analysis Series. These ratios provide some warning signs that we will use to diagnose problem areas and suggest possible solutions.

Financial Ratios

Several financial ratios of particular use to farmers can be calculated from the balance sheet, income statement, and cash flow statement. Financial health is estimated by measures of liquidity, solvency, profitability, repayment capacity, and financial efficiency and can reveal levels of financial health when compared to benchmarks. Table 1 shows the ratios discussed below, with the formula and value ranges for strong, stable, and weak levels.

Liquidity

Liquidity measures use current assets and current liabilities to determine a business's ability to pay short-term expenses without making long-term changes, such as unexpectedly selling land or equipment or getting a new loan. **Current assets** are assets that can be readily converted to cash, such as bank accounts, investments, and inventories. Current liabilities are liabilities due within a year, such as accounts payable, production loans, and current portions of noncurrent debt.

The **current ratio** is calculated by dividing current farm assets by current farm liabilities. It is a healthy sign to have an increasing liquidity ratio above 2.0, as this signifies that more expenses can be paid on time and cash is available for unexpected needs. **Working capital** is calculated by subtracting current farm liabilities from current farm assets. Positive working capital indicates that the farm business can use this working capital solely for short-term payment, with no long-term debt changes.

Solvency

While liquidity measures consider the current period, solvency ratios consider a farm business's ability to cover all liabilities with all assets. The **debt-to-asset ratio** is calculated by dividing total farm liabilities by total farm assets. A debt-to-asset ratio above 60 percent signals a weak condition (though experts disagree on this threshold). What represents a weak debt-to-asset ratio often depends on the type of enterprise (such as a dairy or grain farm), the stage of the business (such as entry level or consolidation phase), and the level of land ownership. Because larger and beginning farms are more inclined to borrow money, debt can be a larger portion of the business, putting them at higher risk than smaller farms. Operating on rented land tends to lead to high debt-to-asset ratios because the operation does not have land as an asset.

Profitability

Net farm income, rate of return on assets, and rate of return on equity are all measures of profitability. Higher values indicate desirable levels of profit. **Net farm income** is calculated by matching revenues with expenses incurred to create those revenues, plus the gain or loss on the sale of business assets but before

taxes. The **rate of return on farm assets** is calculated as income from operations less owner withdrawal for unpaid labor and management, divided by average total farm assets. Similarly, the **rate of return on farm equity** is calculated as income from operations less farm interest expense less owner withdrawal for unpaid labor and management, divided by average total farm equity. The **operating profit margin ratio** is calculated as income from operations less owner withdrawal for unpaid labor and management, divided by gross revenue.

You can improve profitability by increasing the volume of production or the selling price. When investigating cost-cutting strategies, evaluate enterprise budgets to gain insight into the use and cost of inputs.

Repayment Capacity

Repayment capacity measures the business's ability to generate enough cash to pay current debt commitments. **Capital debt repayment capacity** estimates the amount of cash generated for debt repayment and is calculated as income from operations plus nonfarm income plus depreciation, less interest on term debt, less income and social security taxes, less family living withdrawals. The **debt coverage ratio** is calculated by dividing capital debt repayment capacity by the scheduled principal and interest on term debt. In simpler terms, all the cash generated to repay debts is divided by the total principal and interest due in the current period. A value of less than 1 signals that the business is unable to pay current liabilities with cash generated. This does not necessarily mean that the business cannot repay the debts but that additional cash must come from other sources.

Financial Efficiency

The operating expense, interest expense, and asset turnover ratios all indicate financial efficiency. The **operating expense ratio** illustrates the proportion of revenue being used for operating expenses and is calculated by dividing gross farm expense less farm interest expense less depreciation expense by gross farm revenue. The **interest expense ratio** illustrates the proportion of revenue used for interest expense and is calculated by dividing total farm interest expense by gross farm revenue. Finally, the **asset turnover ratio** shows how efficiently assets are used on the farm and is calculated by dividing gross farm revenue by average farm assets.

Using Ratio Analysis

Table 1 lists the financial ratios discussed, with relative strength measures of strong, stable, and weak. These indicators are generally agreed upon by agricultural finance experts and can be adjusted for regional or individual circumstances. A good example is the difference in the rate of return on farm assets between farm businesses that consist primarily of owned land versus rented land. A farm business with mostly owned land has lower ratios for strong and stable conditions because the average total farm assets value in the denominator is greater than for a farm business that has mostly rented land.

Ratio calculations are shown in Table 2, using balance sheet (Publication 3713), income statement (Publication 3707), and cash flow statement (Publication 3710) values. The liquidity and solvency measures in the example show stable financial health. For profitability measures, the rate of return on assets and operating profit margin ratio are both stable, but the rate of return on equity is weak. To improve the rate of return on equity, the farm manager can focus on increasing sales volume by expanding the operation, increasing the sales price by using additional marketing tools, or increasing off-farm income to offset owner withdrawals.

Values for the asset turnover ratio and term debt coverage ratios are both considered weak. To improve these measures, the farm manager can focus on increasing sales volume and selling price as described previously. The term debt coverage ratio can also be improved by decreasing owner withdrawals or increasing off-farm income.

Note: When comparing financial ratios to benchmarks, ensure the farm value is calculated the same way as the benchmark value. Otherwise, you may be incorrectly convinced that your farm is struggling or succeeding. Pay special attention to trends in the financial ratio analysis; these can indicate future financial stress to plan for.

Table 1. Financial ratios with relative strength measures.

Liquidity				
Ratio	Formula	Relative Strength		
Current Ratio ^a	Total current farm assets / Total current farm liabilities	<1.0	1.0–2.0	>2.0
		Weak	Stable	Strong
Solvency				
Ratio	Formula	Relative Strength		
Debt-to-Asset Ratio ^a	Total farm liabilities / Total farm assets	<0.30	0.30–0.60	>0.60
		Strong	Stable	Weak
Profitability				
Ratio	Formula	Relative Strength		
Net Farm Income from Operations ^{bc}	Gross cash farm income – total cash farm expenses +/- inventory changes – depreciation	Look at trends; varies with cyclical nature of agricultural prices and income		
Rate of Return on Farm Assets (mostly owned) ^{abc}	(Income from operations – owner withdrawal for unpaid labor and management) / Average total farm assets	<0.01	0.01–0.05	>0.05
		Weak	Stable	Strong
Rate of Return on Farm Assets (mostly rented or leased) ^{abc}	(Income from operations – owner withdrawal for unpaid labor and management) / Average total farm assets	<0.03	0.03–0.12	>0.12
		Weak	Stable	Strong
Rate of Return on Farm Equity ^{abc}	Income from operations – farm interest expense – owner withdrawal for unpaid labor and management) / Average total farm equity	<0.05	0.05–0.10	>0.10
		Weak	Stable	Strong
Operating Profit Margin Ratio ^{bc}	(Income from operations – owner withdrawal for unpaid labor and management) / Gross revenue	<0.10	0.10–0.25	>0.25
		Weak	Stable	Strong
Efficiency				
Ratio	Formula	Relative Strength		
Operating Expense Ratio ^c	(Total operating expenses – depreciation/amortization expense) / Gross revenue	<0.60	0.60–0.80	>0.80
		Strong	Stable	Weak
Interest Expense Ratio ^c	Total farm interest expense / Gross revenue	<0.10	0.10–0.20	>0.20
		Strong	Stable	Weak
Asset Turnover Ratio ^{a,c}	Gross revenue / Average total farm assets	<0.20	0.20–0.40	>0.10
		Weak	Stable	Strong
Term Debt Coverage ^{abc}	(Income from operations +/- total miscellaneous revenues/expenses + total nonfarm income + depreciation/amortization expense – total income tax expense – owner withdrawals (total) – interest expense on current debt) / Total principal and interest on term debt	<1.10	1.10–1.50	>1.50
		Weak	Stable	Strong

^a Numbers obtained from the balance sheet.

^b Numbers obtained from the cash flow statement.

^c Numbers obtained from the income statement.

Table 2. Financial ratio example calculations.

Ratio	Calculations from Balance Sheet	Relative Strength
Current Ratio ^a	$337,981 / 218,372 = 1.55$	Stable
Debt-to-Asset Ratio ^a	$1,508,398 / 4,124,590 = 0.366$	Stable
Rate of Return on Farm Assets (ROA) ^{bc}	$(175,314 - 55,740) / 4,077,326 = 0.0293$	Stable
Rate of Return on Farm Equity (ROE) ^{abc}	$(175,314 - 39,309 - 55,740) / 2,552,593 = 0.0314$	Weak
Operating Profit Margin Ratio ^{bc}	$(175,314 - 55,740) / 735,682 = 0.1625$	Stable
Operating Expense Ratio ^c	$(560,368 - 67,204 - 13,506) / 735,682 = 0.652$	Stable
Interest Expense Ratio ^c	$39,309 / 735,682 = 0.053$	Strong
Asset Turnover Ratio ^a	$735,682 / 4,077,326 = 0.180$	Weak
Term Debt Coverage ^{abc}	$(175,314 + 0 + 28,089 + 80,710 - 48,622 - 68,420 - 3,648) / (100,926 + 13,506 + 39,309) = 1.063$	Weak

^a Numbers obtained from the balance sheet.

^b Numbers obtained from the cash flow statement.

^c Numbers obtained from the income statement.

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