



Farm and Ranch Stress Test

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The farm stress test is designed to provide insight into sources of farm financial stress and the extent of stress. It highlights a few key financial measures and provides a visual interpretation of the numbers. Ideally, the numbers used in the stress test come from current financial statements (cash flow statement, balance sheet, income statement) developed in a manner consistent with Farm Financial Standards guidelines (www.FFSC.org). Any financial measure is only as good as the information used in calculating it. Honest insights require honest data. Consecutive years of financial measures developed in a consistent manner provide the best information about changes in financial performance and position of a business.

Financial ratios vary considerably among farms of different types, for instance, dairy operations and stocker operations. What may be critical for one farm might be tolerable for another.

No one measure can indicate farm financial performance or position. Instead, several measures must be calculated to give a more complete picture. Liquidity, solvency, profitability, and repayment capacity are areas for which financial measures are useful.

Liquidity is the ability of the business to generate enough cash to pay farm and family expenses (including debt payments) on time.

Solvency is the ability of the business to pay all debts if it were sold today. The debt/asset ratio measures the proportion of total farm assets owed to creditors. The current ratio indicates the extent to which current farm assets, if sold, would pay liabilities due this year.

Profitability measures the financial performance of the farm over a period of time, usually a year. Net farm income represents the return to land, labor, and management. The rate of return on assets is an index of profitability as is the rate of return on equity.

Repayment capacity focuses on the farm's ability to repay debt from farm and nonfarm income.

A brief description of financial measures included in the stress test follows. Formulas for calculating the ratios are shown in the stress test.

Current ratio. Current assets are those expected to be sold or used up in the coming year; current liabilities are those due in the coming year, including scheduled principal and interest payments on long term debt. The ratio indicates the extent to which current assets, if liquidated, would cover current farm liabilities. Thus, the higher the ratio, the greater

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is business liquidity. Lower ratios indicate the potential for cash flow problems. The ratio can vary significantly during the year, for instance, if a crop has been harvested but not yet sold. Dairies and other businesses with steady inflows of cash can support a lower current ratio than other types of farms.

Debt to asset ratio. This ratio indicates the proportion of total assets owed to creditors. The higher the ratio, the greater financial risk the business faces.

Net farm income from operations. This value represents the return to unpaid labor, management, and owner equity. There is no single standard for farms of different sizes with different enterprises. Net cash income is adjusted for changes in inventory and depreciation. Changes in inventory (accrual adjustments) may add to income (increases in accounts receivable, prepaid expenses, cash investments in growing crops, supplies on hand) or decrease income (increases in accounts payable, taxes due, or other liabilities).

Rate of return on farm assets (ROA). ROA serves as an index of profitability. The higher the value, the more profitable is the business. ROA is most meaningful in year-to-year comparisons if assets are valued using their cost basis. ROA for agricultural assets is typically low compared to nonfarm investments.

Rate of return on farm equity (ROE). ROE also serves as an index of profitability. Like ROA, the higher the value, the more profitable is the business. ROE is most meaningful in year-to-year comparisons if assets are valued using their cost basis. If debt is being used advantageously, ROE will be greater than ROA. ROE can be compared to the return that could be earned in alternative investments, such as certificates of deposits, bonds, or stock mutual funds.

Debt coverage ratio. This ratio indicates the ability of the business to cover term debt. The higher the ratio, the greater the "cushion" to cover all payments. Capital lease payments should be included as part of term debt. What is a reasonable value varies with farm enterprises, diversification, management abilities, and stability of nonfarm income.

Operating expense ratio. This ratio indicates the proportion of total income used to pay expenses. The higher the ratio, the greater the financial risk in periods of low market prices.

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Liquidity

$$\text{Current ratio} = \frac{\text{Current farm assets}}{\text{Current farm debt}}$$

Solvency

$$\text{Debt to asset ratio} = \frac{\text{Total farm debt}}{\text{Total farm assets}}$$

Profitability

$$\text{Net farm income from operations} = \frac{\text{Gross cash farm income} - \text{total cash farm expenses} \pm \text{inventory changes} - \text{depreciation}}{\text{Average farm assets}}$$

$$\text{Rate of return on farm assets} = \frac{(\text{Net farm income from operations} + \text{farm interest expense} - \text{value of operator's labor \& management})}{\text{Average farm assets}}$$

$$\text{Rate of return on farm equity} = \frac{(\text{Net farm income from operations} - \text{value of operator's labor \& management})}{\text{Average farm equity}}$$

Repayment capacity

$$\text{Debt coverage ratio} = \frac{(\text{Net farm income from operations} + \text{net nonfarm income} + \text{depreciation} + \text{interest on term debt} - \text{income and social security taxes} - \text{family living expenses})}{(\text{scheduled principal and interest on term debt})}$$

Efficiency

$$\text{Operating expense ratio} = \frac{(\text{Gross farm expense} - \text{farm interest expense} - \text{depreciation expense})}{\text{Gross farm revenue}}$$

$$\text{Interest expense ratio} = \frac{\text{Interest expense}}{\text{Gross farm revenue}}$$

$$\text{Asset turnover ratio} = \frac{\text{Gross farm revenue}}{\text{Average farm assets}}$$

Low Stress

High Stress



Interest expense ratio. This ratio indicates the proportion of total income committed to interest payments. Farm operations are considered vulnerable once the ratio is 15 percent.

Asset turnover ratio. Profitable and efficient operations generate more revenue with a given set of resources. The ratio can vary substantially between farms of different types, but the higher the ratio, the more efficiently farm assets are being used.

Summary

Financial ratios condense a large amount of information into a convenient form for analysis. Both the magnitude of the measure and relationships between measures should be considered.

For more information on farm financial statements and analysis, see OSU Fact Sheets AGEC-751, AGEC-752, AGEC-753, and AGEC-790. For copies, see <http://www.osuextra.com> or contact your local OSU Extension Center to request educational programs on financial management.

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