Financial Ratios Used in Financial Management

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Financial aspects of the farm business have rapidly increased in importance in recent years. Farm business size has increased. Cash expenses have gone up. Larger amounts of credit are being used.

As the size of an operation increases and credit use is expanded, financial management becomes more critical to the success of the operation. More sophisticated accounting systems are needed to furnish farm financial management information. This calls for tools to help interpret accounting figures. This is where financial ratios come in.

Non-agricultural businesses have used financial ratios to interpret data from financial reports for many years. When investments in farm businesses were small, the need for this type of analysis was minimal. With the magnitude of today's farm businesses, financial ratios can aid in converting the mass of data that is common in a farm accounting system into meaningful information.

A financial ratio is simply a comparison of two measurements of a business to each other. For example, a measurement of income may be compared to a measurement of size. The two measurements are expressed in terms of a ratio of one number to another number. The measurements can also be expressed in terms of the percent that one is to another. For example, a farm business with a net farm income of $50,000 and a gross farm revenue of $250,000 has a net farm income to gross farm revenue ratio of 1:5. Expressed in percentage terms, this same farm business has a net farm income that is 20 percent of the gross farm revenue.

Data for financial ratios come from the balance sheet, the cash flow statement, and the income statement.

The balance sheet is a listing of the assets and liabilities of the business and the resulting equity on a given date. Equity is the difference between the assets and the liabilities. For more detail on the balance sheet see *Balance Sheet — A Financial Management Tool,* MF291.

A cash flow statement records the dollars going in and the dollars going out of a business. It shows where the money comes from — the inflow of cash — and where the money goes — the outflow of cash. For more detail on the cash flow statement, see *Cash Flow Projection for Operating Loan Determination,* MF275.

The income statement is a listing of the receipts and the expenses of a business, including depreciation, and the resulting net income for a specific period. Allowance is made for changes in inventories. Net farm income is equal to receipts minus expenses plus or minus the change in inventories. For more detail on the income statement, see *Income Statement — A Financial Management Tool,* MF294. The actual data used in this publication was obtained from the case farm in these three publications.

Financial ratios can be put to many uses. They may be used by a farm operator or business manager in managerial analysis; they also may be used by a lending agency in credit analysis; and they may be used by an investor in investment analysis.

A number of useful ratios have been found to be indicators of farm financial progress and risk-bearing ability. These ratios can be grouped into five categories:

- Liquidity
- Solvency
- Profitability
- Financial Efficiency
- Repayment Capacity

Liquidity Indicators

Liquidity measures the ability of a farm business to meet financial obligations as they come due in the ordinary course of business, without disrupting the normal operations of the business. The current ratio and working capital measure liquidity and can be calculated using balance sheet data.

The *Current Ratio* indicates the extent to which current farm assets, if liquidated, would cover current farm liabilities. The higher the ratio, the greater the liquidity.

$$\text{Current Ratio} = \frac{\text{Total Current Farm Assets}}{\text{Total Current Farm Liabilities}}$$

Example: 211,982 ÷ 261,221 = 0.81 (0.81:1)

In other words, this operation has $0.81 of current assets for each $1.00 of current liabilities owed to others.

Working Capital is a measure of the amount of funds available to purchase inputs and inventory items after the sale of current farm assets and payment of all current farm liabilities. The amount of working capital considered adequate is related to the size and type of farm business. In this example, the farm has negative working capital, meaning they do not have enough funds to cover their liabilities that will come due this year and may need to refinance.

Working Capital =
Total Current Farm Assets – Total Current Farm Liabilities

Example: 211,982 – 261,221 = $-49,239

Working Capital as a Percent of Gross Revenue adjusts for farm size and can be compared among farms with similar enterprises but that vary in size. A higher ratio could be indicative of a farm with more liquidity.

$$\text{Working Capital to Gross Revenue} = \frac{\text{Working Capital}}{\text{Gross Farm Revenue}}$$

Example: -49,239 ÷ 686,332 = -0.072 (-7.2%)

Solvency Indicators

Solvency measures the amount of debt and other expense obligations used in the farm business relative to the amount of owner equity invested in the business. Solvency ratios provide an indication of the business's ability to repay all financial obligations if all assets were sold, as well as an indication of the ability to continue operations as a viable farm business after a financial adversity, such as a drought or low commodity prices. Financial ratios that measure solvency are calculated from balance sheet data, and are:

- Debt/Asset Ratio
- Equity/Asset Ratio
- Debt/Equity Ratio

The *Debt/Asset Ratio* compares total farm liabilities to the value of total farm assets, and therefore measures financial position. This ratio expresses what proportion of total farm assets is owed to creditors. The ratio is one measure of the risk exposure of the farm business; thus, is important in evaluating the financial trend of the business. The goal of some farm business operators is to approach a debt-free operation. A continual lowering of this ratio is a trend in that direction. The higher the ratio, the greater the risk exposure of the farm business.

$$\text{Debt/Asset Ratio} = \frac{\text{Total Farm Liabilities}}{\text{Total Farm Assets}}$$

Example: 906,459 ÷ 2,938,018 = 0.309 (30.9%)

The *Equity/Asset Ratio* measures the proportion of total farm assets financed by the owner's equity capital, and therefore indicates financial position. The higher the ratio value, the more total capital has been supplied by the owner and less by creditors.

$$\text{Equity/Asset Ratio} = \frac{\text{Total Farm Equity}}{\text{Total Farm Assets}}$$

Example: 2,031,558 ÷ 2,938,018 = 0.691 (69.1%)

The *Debt/Equity Ratio* measures financial position and reflects the extent to which farm debt capital is being combined with farm equity capital. The higher the ratio value, the more total capital has been supplied by creditors and less by the owner.

$$\text{Debt/Equity Ratio} = \frac{\text{Total Farm Liabilities}}{\text{Total Farm Equity}}$$

Example: 906,459 ÷ 2,031,558 = 0.446 (44.6%)

Profitability Indicators

Profitability measures the extent to which a farm business generates a profit from the use of land, labor, management, and capital. Financial ratios and values that measure profitability are calculated from balance sheet and income statement data, and include:

- Rate of Return on Farm Assets
- Rate of Return on Farm Equity
- Operating Profit Margin Ratio
- Net Farm Income

The *Rate of Return on Farm Assets Ratio* is often used as an overall index of profitability of the farm business. The higher the ratio value, the more profitable the farm business.

$$\text{Rate of Return on Farm Assets} = \frac{\text{Net Farm Income + Interest Expense – Unpaid Family Labor}}{\text{Average Total Farm Assets}}$$

Example: (98,640 + 41,748 – 60,000) ÷ 2,938,018= 0.0274 (2.74%)

The *Rate of Return on Farm Equity Ratio* provides a measure of the return on the owner's equity capital employed in the farm business. The higher the ratio value, the more profitable the farm operation.

$$\text{Rate of Return on Farm Equity} = \frac{\text{Net Farm Income – Unpaid Family Labor}}{\text{Average Total Farm Equity}}$$

Example: (98,640 – 60,000) ÷ 2,031,558 = 0.0190 (1.90%)

The *Operating Profit Margin Rati*o measures profitability in terms of return per dollar of value of farm production. A farm business has two ways to increase profits — either by increasing the profit per unit produced, or by increasing the volume of production if the farm business is profitable. A relationship exists between the rate of return on farm assets, the asset turnover ratio, discussed below, and the operating profit margin ratio. If the asset turnover ratio is multiplied by the operating profit margin ratio, the result is the rate of return on farm assets.

$$\text{Operating Profit Margin Ratio} = \frac{\text{Net Farm Income + Interest Expense – Unpaid Family Labor}}{\text{Value of Farm Production}}$$

Example: (98,640 + 41,748 – 60,000) ÷ 664,749= 0.1209 (12.09%)

NOTE: Value of farm production is defined as the sum of livestock, crop, and other income computed on an accrual basis (adjusted for inventory changes) less accrued purchased feed.

Net Farm Income is calculated by matching farm revenues with farm expenses incurred to create those revenues. Net farm income is typically computed on a before-tax basis. It comes directly off of the income statement without any additional calculations.

Example: $98,640

Financial Efficiency Indicators

Financial efficiency measures the intensity with which a farm business uses its assets to generate value of farm production and the effectiveness of production, purchasing, pricing, financing, and marketing decisions. Financial efficiency ratios are calculated from balance sheet and income statement data, and include the following ratios:

- Asset Turnover Ratio
- Operating Expense Ratio
- Depreciation Expense Ratio
- Interest Expense Ratio
- Total Expense Ratio
- Net Farm Income Ratio

The *Asset Turnover Ratio* measures how efficiently farm assets are being used to generate revenue. The higher the value of the ratio, the more efficiently assets are being used to generate revenue. The value of this ratio will vary by type of farm operation and by the percentage of acres owned.

$$\text{Asset Turnover Ratio} = \frac{\text{Value of Farm Production}}{\text{Average Total Farm Assets}}$$

Example: 664,749 ÷ 2,938,018= 0.2263 (22.63%)

The five operational ratios reflect the relationship of expense and income categories to Gross Farm Revenue. The sum of the first three operational ratios equals the total expense ratio. The sum of total expense ratio and net farm income ratio is one.

NOTE: Either *Value of Farm Production* or *Gross Farm Revenue*, can be used to calculate the financial efficiency and operating profit margin ratios.

$$\text{Operating Expense Ratio} = \frac{\text{Total Farm Business Expenses – Depreciation Expense – Interest Expense}}{\text{Gross Farm Revenue}}$$

Example: (587,692 – 48,574 – 41,748) ÷ 686,332 = 0.7248 (72.48%)

$$\text{Depreciation Expense Ratio} = \frac{\text{Depreciation Expense}}{\text{Gross Farm Revenue}}$$

Example: 48,514 ÷ 686,332 = 0.0707 (7.07%)

$$\text{Interest Expense Ratio} = \frac{\text{Interest Expense}}{\text{Gross Farm Revenue}}$$

Example: 41,748 ÷ 686,332 = 0.0608 (6.08%)

$$\text{Total Expense Ratio} = \frac{\text{Total Farm Expense}}{\text{Gross Farm Revenue}}$$

Example: 587,692 ÷ 686,332 = 0.8563 (85.63%)

$$\text{Net Farm Income Ratio} = \frac{\text{Net Farm Income}}{\text{Gross Farm Revenue}}$$

Example: 98,640 ÷ 686,332 = 0.1437 (14.37%)

Repayment Capacity Indicators

Repayment capacity measures are used to determine whether a farm has the ability to cover principal and interest payments, and evaluate the farm's ability to acquire capital and service additional debt.

Income Available for Capital Replacement and Term Debt Repayment can be used to examine a farm's repayment capacity. This measure should be compared to projected capital and term debt payment needs.

Income Available for Capital Replacement and Term Debt Repayment = [Net Farm Income + Total Nonfarm Income + Depreciation Expense – Income Taxes Paid – Unpaid Family Labor]

Example: (98,640 + 28,089 + 48,514– 12,900– 60,000) = $102,343

Uses of Financial Ratios

The establishment of minimum or maximum ratio values that all farm businesses should meet for each financial ratio is extremely difficult. One objective in the use of financial ratios is to evaluate the condition of a farm business as a unit. A specific ratio concentrates attention upon specific details of the business. The use of a single ratio or placing excessive emphasis on one ratio, may be misleading. For example, an operator who has just started a farm business may have a debt/asset ratio that is much higher than an operator who has built the farm business over a longer time. The young operator, even though of equal ability, compares his/her debt to a much smaller asset base. But, this same young operator may show a more desirable rate of return to assets than his/her counterpart, again because of the smaller asset base.

The interpretation of one ratio may be altered by other ratios of the same business. Some lending institutions, farm operators and farm advisors have selected a group of ratios that they believe give a composite picture of the farm business. The calculated ratios of a specific farm business are then interpreted as a group, rather than making judgements on individual ratios.

Another objective in the use of financial ratios is to detect strengths and weaknesses within a farm business. Comparison of ratios of a farm business to ratios of other farm businesses of similar type may detect strengths or weaknesses. Comparing to established standards is helpful. Refer to the *KSU-Farm Financial Benchmarking Tool* available at *www.AgManager.info/Tools* for comparable farm financials in Kansas. Comparison of ratios of a farm business to earlier years also gives indication of progress made within the business.

A good agricultural accounting system should result in an income statement, cash flow statement, and a balance sheet report of the farm business. Values needed in calculating each of the above ratios are listed on these three reports. Once the accounting system provides the data, the ratios can be calculated in a matter of minutes.

Summary

As farm business size increases and credit usage goes up, a means of evaluating the condition of the farm operation as a business unit becomes more critical. Financial ratios provide one method of interpreting data in farm financial reports. The following guidelines furnish a framework for using financial ratios:

1. A financial ratio is a comparison of two measurements of a business. The objective is to evaluate the condition of the farm business as a unit.
2. Data for most financial ratios come from the balance sheet, the income statement, and the cash flow statement.
3. Financial ratios are useful indicators of financial progress and risk-bearing ability.
4. The interpretation of one ratio may be altered by other ratios of the same business.
5. Financial ratios of a specific business are best interpreted as a group, rather than making judgments on individual ratios.
6. Individual ratios may be used to detect strengths and weaknesses within a farm business.

For further information on farm financial management, see the following publications:

- *Cash Flow Projection for Operating Loan Determination*, MF275
- *Balance Sheet - A Financial Management Tool,* MF291
- *Income Statement - A Financial Management Tool,* MF294
- *Computation of Deferred Tax Liability*

Also, see the publication *Financial Guidelines for Agricultural Producers, Recommendations of the Farm Financial Standards Council*, Revised, January 2016, which was used as one of the primary sources for these publications.

Publications from Kansas State University are available at: *www.bookstore.ksre.ksu.edu*

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