

Financial Ratio Analysis for Agricultural Cooperatives

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Financial statements contain information that describes the cooperative firm's financial position and performance. Cooperative leaders need to analyze and interpret that information in order to make informed financial decisions. This process can be improved using the tools and techniques of Financial Statement Analysis. Some of the common components of financial statement analysis include:

- Comparative Analysis
- Common Size Analysis
- Financial Ratio Analysis
- Trend Analysis

Comparative Analysis

The development of comparative financial statements is one of the most commonly used techniques for analyzing financial statements. This technique compares the financial statements from two or more time periods or compares the current statement with the budgeted statement. Comparative analysis is typically limited to the income statement and balance sheet. The comparative balance sheet can be used to determine how the financial position of the firm has changed. The comparative income statement can be used to examine how the cooperative's current performance compares with previous periods.

Examples of comparative Balance Sheet and Income and Expense Statement are provided below. We can note several changes in the cooperative. Total assets actually decreased and the cooperative made significant reduction in its long term debt. The cooperative's sales increased over the previous year as did its cost of goods sold and operating expenses. The net result was a decrease in local savings. A cooperative board of directors would likely use a more detailed version of the financial statements. That would allow the comparison of individual expense categories. The comparative statements would help them analyze the cooperative financial situation and performance relative to the previous year or to a series of previous years.

Balance Sheet		
	2016	2015
Current Assets		
Cash	23,047,115	13,369,337
Receivables	6,900,122	10,441,837
Inventory	23,307,346	34,088,821
Prepaid Expenses	2,957,753	6,167,646
Deferred Tax Asset	153,068	166,384
Total Current Assets	56,569,755	64,944,402
Non-Current Assets		
Land	8,257,699	8,222,498
Property Plant and Equipment	111,648,529	108,275,499
Accumulated Depreciation	(60,538,441)	(54,793,748)
Net Property Plant and Equipment	51,110,088	53,481,751
Investment in Cooperatives	14,425,588	13,938,756
Total Non-Current Assets	73,793,375	75,643,005
Total Assets	130,363,130	140,587,407
	2016	2015
Current Liabilities		
Accounts Payable	29,034,680	33,927,221
Current Portion of Long Term Debt	3,296,379	3,429,202
Notes Payable	9,794,665	10,259,170
Accrued Expenses	3,369,112	2,506,119
Patronage Refunds Payable	556,940	1,124,461
Total Current Liabilities	46,051,776	51,246,173
Long Term Liabilities		
Notes Payable	11,053,637	18,212,231
Members Equity		
Membership Stock	4,961,411	1,982,883
Qualified Revolving Equity	20,100,202	21,297,892
Non-qualified Revolving Equity	20,000,000	23,703,808
Unallocated Equity	28,196,104	24,144,420
Total Member Equity	73,257,717	71,129,003
Total Liabilities and Equity	130,363,130	140,587,407

Income and Expense Statement	2016	2015
Sales	255,862,563	233,692,387
Cost of Goods Sold	226,668,114	205,804,496
Gross Margin	29,194,449	27,887,891
Other Revenue	12,952,545	12,702,659
Total Revenue	42,146,994	40,590,550
Operating Expenses	38,390,643	35,156,183
Local Savings	3,756,351	5,434,367
Patronage Dividend Income	2,101,955	2,100,129
Total Savings Before Taxes	5,858,306	7,534,496
Income Tax	444,509	499,727
Net Savings after Taxes	5,413,797	7,034,769

Common Size Analysis

Comparing the financial statements with previous years or budget estimates can provide useful insights. The analysis of individual categories can be challenging if the cooperative's sales changed due to weather or other factors or if the cooperative's asset based changed which is typical for a growing firm. Common size analysis is an additional technique that can be used to analyze and interpret financial statements. In common size analysis each line on the financial statement is expressed as a percentage of the base for that period. In the case of the income statement the base is the total sales for the period while the balance sheet entries are expressed as a percent of total assets.

Common size analysis has several advantages. First, it further facilitates comparative analysis. When a cooperative's sales increase year over year, one would expect the cost of goods sold and operating expenses to also increase. That raises the question as to whether changes in those categories were simply due to the change in sales or if they indicate problems in expense control. Expressing the comparative statements in a common size format adjusts for the change in sales and allows the board and CEO to see what categories were changing relative to total sales.

Common size analysis also emphasizes the contribution of each income and expense item to net income and each balance sheet income to total assets. That helps cooperative leaders to focus on areas where there are changes in categories that have significant impact. Finally, common size analysis facilitates comparison with other firms of different sizes.

Examples of common size balance sheet and income and expense statements are shown below. The common size format makes it much easier to identify changes from the comparison year. Examining the common size balance sheet, we can see that current assets now represent a smaller portion of total assets and that long term debt decreased, relative to total assets. Examining the common size income statement we can see that the cost of goods sold increased

relative to sales while the amount of other income and patronage income received from regional cooperatives decreased. The result was a lower after tax profit margin. We can also note that while operating expenses increased in dollar terms, the level of operating expense to sales was constant.

Balance Sheet		
	2016	2015
Current Assets		
Cash	17.7%	9.5%
Receivables	5.3%	7.4%
Inventory	17.9%	24.2%
Prepaid Expenses	2.3%	4.4%
Deferred Tax Asset	0.1%	0.1%
Total Current Assets	43.4%	46.2%
Non-Current Assets		
Land	6.3%	5.8%
Property Plant and Equipment	85.6%	77.0%
Accumulated Depreciation	-46.4%	-39.0%
Net Property Plant and Equipment	39.2%	38.0%
Investment in Cooperatives	11.1%	9.9%
Total Non-Current Assets	56.6%	53.8%
Total Assets	100.0%	100.0%
	2016	2015
Current Liabilities		
Accounts Payable	22.3%	24.1%
Current Portion of Long Term Debt	2.5%	2.4%
Notes Payable	7.5%	7.3%
Accrued Expenses	2.6%	1.8%
Patronage Refunds Payable	0.4%	0.8%
Total Current Liabilities	35.3%	36.5%
Long Term Liabilities		
Notes Payable	8.5%	13.0%
Members Equity		
Membership Stock	3.8%	1.4%
Qualified Revolving Equity	15.4%	15.1%
Non-qualified Revolving Equity	15.3%	16.9%
Unallocated Equity	21.6%	17.2%
Total Member Equity	56.2%	50.6%
Total Liabilities and Equity	100.0%	100.0%

Income and Expense Statement	2016	2015
Sales	100.0%	100.0%
Cost of Goods Sold	88.6%	88.1%
Gross Margin	11.4%	11.9%
Other Revenue	5.1%	5.4%
Total Revenue	16.5%	17.4%
Operating Expenses	15.0%	15.0%
Local Savings	1.5%	2.3%
Patronage Dividend Income	0.8%	0.9%
Total Savings Before Taxes	2.3%	3.2%
Income Tax	0.2%	0.2%
Net Savings after Taxes	2.1%	3.0%

Financial Ratio Analysis

Ratio analysis is one the important tools for financial statement analysis. Financial ratios highlight the relationship between two or more entries on the financial statements. Financial ratios can be tracked over time to determine if the cooperative is making progress toward its financial goals and the ratios can be compared with industry benchmarks. A more advanced analysis can be performed by examining the relationship between multiple financial ratios. Financial ratios are typically classified based on their purpose. The common categories of financial ratios are:

- Liquidity Ratios
- Solvency Ratios
- Efficiency or Activity Ratios
- Profitability Ratios

Liquidity Ratios

Liquidity relates to a firm's ability to meet its short term obligations. In simple terms liquidity measures determine if the firm has enough cash or assets that will be converted to cash to meet the obligations that will require cash in the coming year.

One of the most common liquidity ratio is the current ratio which is defined as:

$$\text{Current Ratio} = \text{Current Assets} \div \text{Current Liabilities}$$

At a minimum a cooperative would need to maintain a current ratio of 1:00 to be able to pay its obligations as they come due. A common benchmark for the current ratio is a minimum of 2:00 .

Another measure of liquidity is working capital which is defined as:

$$\text{Working capital} = \text{current assets} - \text{current liabilities}.$$

Cooperative leaders can develop specific goals for the dollar amount of working capital. The cooperative's loan covenants often specify minimum working capital level. The appropriate dollar amount of working capital changes as a cooperative grows. For that reason, working capital is often measured with the working capital to sales ratio.

$$\text{Working Capital to Sales} = \text{Working capital} \div \text{total sales}.$$

A common benchmark the working capital to sales ratio is a minimum of 1.5% of grain sales plus 2.5% of farm supply sales. A diversified commodity marketing and farm supply cooperative would therefore likely have a benchmark of 2.0% or higher.

Solvency Ratios

Solvency refers to the amount of debt the cooperative is employing relative to its assets and owner's equity. This category of ratios can also measure whether the firm's cash flow are sufficient to meet the required debt payments. Some of the common solvency ratios include:

$$\text{Debt to Asset Ratio} = \text{Total Debt} \div \text{Total Assets}$$

In many cooperatives the seasonal debt or short term debt can be a significant part of the total debt. There is also significant variation in the amount of short term debt during a normal year. A good portion of the seasonal debt is used to finance inventory which is ordinarily converted to cash within the year. For that reason, many cooperatives place more focus on solvency ratios measuring long term debt.

$$\text{Long term Debt to Asset Ratio} = \text{Long Term Debt} \div \text{Total Assets}$$

A common benchmark for the Long Term Debt to Asset Ratio is a maximum of 50%. Many cooperatives strive for lower levels.

Some equivalent ratios are the *Debt to Equity Ratio* or *Long Term Debt to Equity Ratio*. A Debt to Equity Ratio of 100% is equivalent to a Debt to Asset Ratio of 50%.

As opposed to measuring the amount of debt the Debt Coverage Ratio measures the cooperative's ability to meet the required debt payments. The calculation of the Debt Service Ratio can be somewhat complex. In principle the ratio measures all of the funds the cooperative has available to make debt and lease payments relative to the amount of those payments. One definition of the Debt Coverage Ratio is:

$$\text{Debt Coverage Ratio} = \frac{\text{Earnings before Interest, Taxes, Loan Principle and Lease Payments}}{\text{Loan Interest and Principle Payments} + \text{Lease Payments}}$$

A common benchmark for the Debt Coverage Ratio is 1.75 to 2.00 or higher.

Calculations for the Debt Service Coverage Ratio also often subtract the gain or loss on asset sales and other non-typical items from the earnings side of the ratio. The adjustment would make the ratio reflect the debt coverage that the cooperative would achieve in a typical year.

Activity and Efficiency Ratios

This category or ratios measures how efficiently the firm is employing its assets and how well it is controlling expenses. A sub-set of these ratios is known as “turnover ratios which measure the relationship between sales and particular asset categories. It is easy to visualize the concept of turnover when we consider the inventory turnover ratio. When the average inventory is much lower than the total annual sales then it is obvious that the inventory “turns over” (is replaced) multiple time during the year. A high inventory turnover ratio indicates the firm is generating a lot of sales from its inventory investment. Some common turnover ratio and common benchmarks include:

$$\text{Total Asset Turnover} = \text{Sales} \div \text{Total Assets}$$

(A common benchmark is a minimum of 2.0

$$\text{Fixed Asset Turnover} = \text{Total Sales} \div \text{Total Assets}$$

(A common benchmark is a minimum of 5.0)

$$\text{Inventory Turnover Ratio} = \text{Farm Supply Sales} \div \text{Average Inventory}$$

(Benchmark depends on the sales profit margin)

$$\text{Accounts Receivable Turnover} = \text{Credit Sales} \div \text{Average Accounts Receivable Balance}$$

(A common benchmark is a minimum of 8:00, depending on the credit terms).

The Accounts Receivable Turnover ratio reflects how long on average it takes the cooperative to collect each dollar of credit sales. A turnover ratio of 8:00 implies an average collection period of 45 days. An equivalent ratio is:

$$\text{Average Collection Period} = \text{Average Accounts Receivable} \div \text{Average Credit Sales per Day}$$

The benchmarks for the Accounts Receivable Turnover Ratio and Average Collection Period also depend on the credit terms being offered. Some cooperatives also calculate the percent of the accounts receivable balance that is past the credit terms, for example many cooperatives strive to keep the portion of accounts receivable past 60 days below 20%

Expense Control Ratios

Other efficiency ratios measure how well the cooperative is controlling expenses. Because the level of expenses would be expected to change with the level of sales, expense ratios are calculated as a percent of sales or percent of gross margin on sales. Many agricultural cooperatives that are marketing bulk commodities or selling bulk inputs strive for a target profit margin per unit. For example a grain marketing cooperative might strive for a \$.50 margin per bushel while a farm supply cooperative might try and achieve a \$50 margin per ton. For that

reason, expense ratios for agricultural cooperatives are typically expressed as a percent of gross margin. That removes the effects of volatile commodity prices from the expense ratio.

In the calculation of gross margin for expense ratios, other operating income such as grain storage income or fertilizer application income that is typically included in the gross margin calculation. Some common expense ratios include:

$$\text{Total Expenses to Gross Margin} = \text{Total Expenses} \div \text{Total Gross Margin}$$

A common benchmark would be less than 80%

$$\text{Personnel Expense to Gross Margin} = \text{Personnel Expense} \div \text{Gross Margin}$$

Common benchmarks would be less 35% for grain only cooperatives and less than 45% for farm supply cooperatives.

$$\text{Fixed Expense to Gross Margin} = \text{Fixed Expenses} \div \text{Gross Margin}$$

A common benchmark for the fixed expense ratio is not to exceed 25% = 30%

$$\text{Other Expense to Gross Margin} = \text{Other Expense} \div \text{Gross Margin}$$

A common benchmark for the other expense ratio is not to exceed 25%

$$\text{Total Operating Expenses to Gross Margin} = \text{Total Operating Expenses} \div \text{Gross Margin}$$

A common benchmark for the total expense ratio is not to exceed 80-85

Profitability Ratios%

Profitability ratios measures the cooperative's success in generating a return for its user-members. While there can be other dimensions of the cooperative value package, profitability is a key objective. Many of the other characteristics of a firm, which are measured by the other financial ratios, ultimately impact profitability. Profitability ratios reflect the level of sales generated, the efficiency of asset utilization, expense control and the capital structure of the firm. Profitability ratios include margin ratios and return ratios.

Margin ratio measure how profit is being generated from sales and gross revenues. Some of the most common margin ratios measure the relation of gross profit, operating profit and net profit to total sales. Managers find margin ratios useful in comparing the cooperative's performance over time. They are more difficult to compare to industry benchmarks because different types of products and services typically yield different profit margins. Margin ratios measure the profit per dollar of sales but not the profitability of the firm. The profitability of the firm depends on both the profit margin per sales dollars and the amount of total sales.

Return Ratios

As the names imply, profitability return ratios measure the financial return the firm is generating. The two most common ratios are the Return on Assets which measures the return the firm is generating from its total assets and the Return on Equity which measures the return to the

owner's invested capital. Both of these return ratios combine information from the income statement with information from the balance sheet.

Return on Assets= Net after Tax Savings ÷ Total Assets

The sole purpose of a cooperative investing in assets is to generate revenue and ultimately produce profits. The return on total asset ratio measures how efficiently the cooperative is utilizing and managing its assets to produce a profit during the current period. A common benchmark for the Return on Total Assets is a minimum of 8%.

Return on Equity = Net Savings after Taxes ÷ Member Equity

The ultimate goal of the cooperative is to generate a return for its user-owners. The return on equity ratio measures how much profit is being generated with each dollar of the owner's equity investment. The return on equity reflects both how well the firm is utilizing its assets and also how the firm used debt and equity financing. When the cooperative is generating returns in excess of the interest rate then the use of debt financing increases the return on equity. This is often referred to as "financial leverage". The use of debt financing also increases the risk of the firm since the loan payments must be paid regardless of profitability. A common benchmark for the return on equity is a minimum of 10%.

Return on Local Assets =:Local Savings ÷ Local Assets

(Where Local Assets =Total Assets – Investment in Regional Cooperatives)

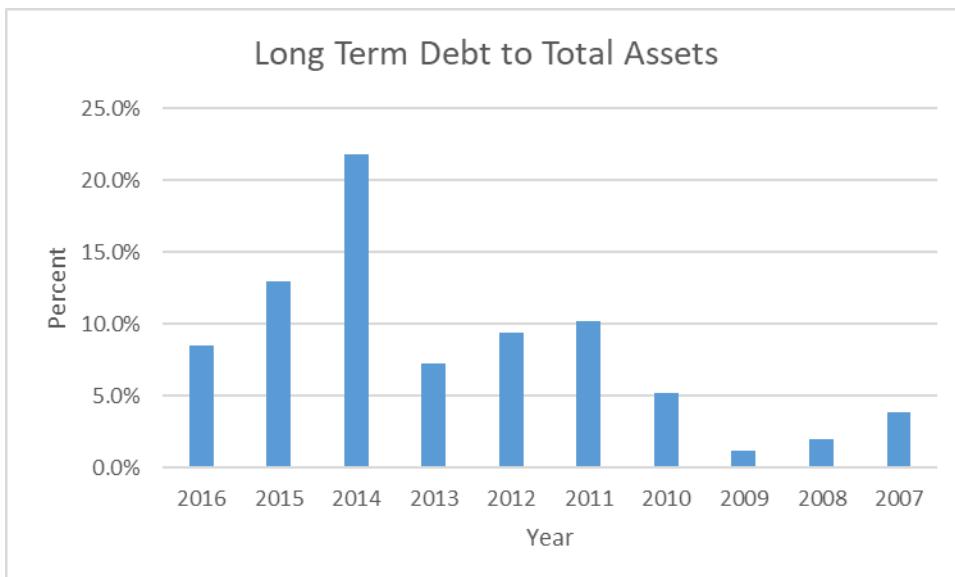
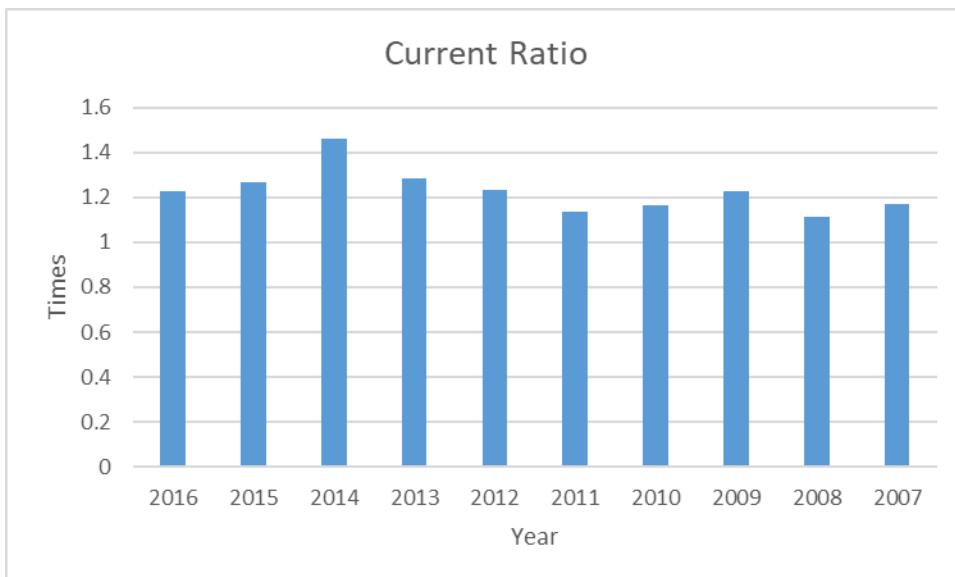
Return on Local Equity = Local Savings ÷ Local Equity –

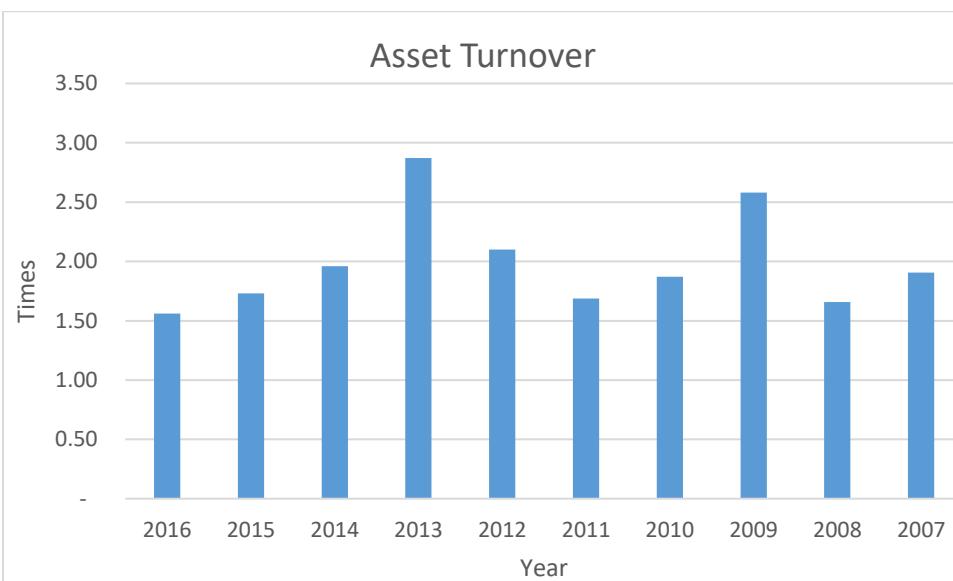
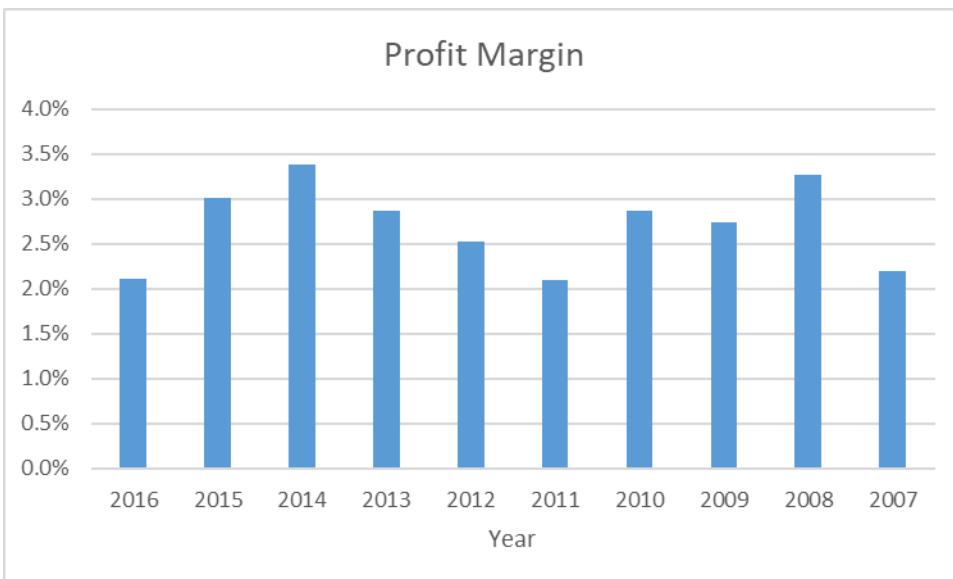
(Where Local Equity = Members equity -Investment in Regional Cooperatives)

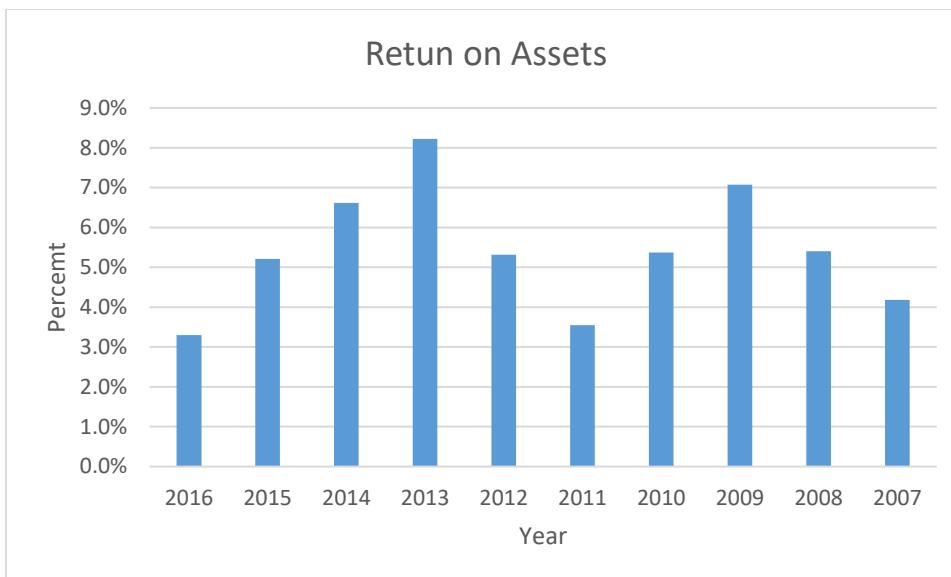
Many local cooperatives are members of regional cooperatives. Under that two tier system the local cooperative receives patronage in both cash and equity from the regional cooperative. The members of the local cooperative are directly impacted by the performance of their local cooperative and indirectly by the performance of the regional cooperative. Because the performance of the regional cooperative is not under the control of the manager and board of the local cooperative, lenders and other parties often look at local savings ratios. These ratios are based on local savings (savings before regional patronage) and local assets (total assets minus equity in regional cooperatives) and local equity (total equity minus equity in regional cooperatives). The same typical benchmarks are used for the local savings ratios but they are more stringent measures since poor performance at the local level cannot be offset by regional patronage. The calculation of local savings is made before taxes so the effects of income taxes are not considered. Agricultural cooperatives have traditionally had low taxable income because they distributed tax deductible patronage refunds. For that reason, the omission of the tax payment has little impact on the difference between local and total savings and the resulting ratios.

Trend Analysis

It is difficult to identify underlying issues with a cooperative's financial condition or performance from a single year's financial statements. Agricultural cooperatives are impacted by weather, commodity prices and the general agricultural economy. Cooperative leaders also sometimes make strategical and financial decisions that temporarily impact the firm's financial position. One of the important steps in financial statement analysis is to examine ratios over time and identify any positive or negative trends. The figures below illustrate a time series of financial ratios from an actual mid-western grain and farm supply cooperative.







In analyzing the trends in the financial ratios we see very little trend in liquidity. The cooperative was able to improve its current ratio for a number of years and is now seeing a slight decline. If the board is satisfied with this level of liquidity and the declining trend in the most recent years does not continue, there are no alarming trends. The graph of Debt to Total Asset Ratios shows that the cooperative has maintained very low leverage. The cooperative's leverage increased during 2014, perhaps because of a capital expenditure project. The cooperative appears to be successfully working down their long term debt load.

The income statement ratios tell a more interesting story. Over the most recent four years the cooperative's profit margin and total asset turnover have both declined. The cooperative is generating less sales from its assets and capturing less profit from each dollar of sales. The result is evident in the last graph showing the trend in the Return on Assets. The cooperative's ROA is declining and has in fact reached the lowest level in the ten year period. The trend analysis identifies a negative trend in profitability and asset utilization that needs to be addressed.

Summary

The financial condition of your cooperative reflects both current decisions and longer run trends and strategies. By closely analyzing your financial statements you will be able to assess the financial position and performance of the cooperative firm and note any favorable or unfavorable trends. Comparative analysis and common size analysis are useful tools to analyze and understand changes from the previous period(s).

