Excellence in Financial Management

Course 1: Evaluating Financial Performance

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Chapter 1: Return on Equity

Why use ratios?

It has been said that you must measure what you expect to manage and accomplish. Without measurement, you have no reference to work with and thus, you tend to operate in the dark. One way of establishing references and managing the financial affairs of an organization is to use ratios. Ratios are simply relationships between two financial balances or financial calculations. These relationships establish our references so we can understand how well we are performing financially. Ratios also extend our traditional way of measuring financial performance; i.e. relying on financial statements. By applying ratios to a set of financial statements, we can better understand financial performance.

Calculating Return on Equity

For publicly traded companies, the relationship of earnings to equity or

Return on Equity is of prime importance since management must provide a return for the money invested by shareholders. Return on Equity is a measure of how well management has used the capital invested by shareholders. Return on Equity tells us the percent returned for each dollar (or other monetary unit) invested by shareholders. Return on Equity is calculated by dividing Net Income by Average Shareholders Equity (including Retained Earnings).

EXAMPLE — Net Income for the year was $ 60,000, total shareholder equity at the beginning of the year was $ 315,000 and ending shareholder equity for the year was $ 285,000. Return on Equity is calculated by dividing $ 60,000 by $ 300,000 (average shareholders equity which is $ 315,000 + $ 285,000 / 2). This gives us a Return on Equity of 20%. For each dollar invested by shareholders, 20% was returned in the form of earnings.

SUMMARY — Return on Equity is one of the most widely used ratios for publicly traded companies. It measures how much return management was able to generate for the shareholders. The formula for calculating Return on Equity is:

Net Income / Average Shareholders Equity

Components of Return on Equity

Return on Equity has three ratio components. The three ratios that make up Return on Equity are:

1. Profit Margin = Net Income / Sales

2. Asset Turnover = Sales / Assets

3. Financial Leverage = Assets / Equity

Profit Margin measures the percent of profits you generate for each dollar of sales. Profit Margin reflects your ability to control costs and make a return on your sales. Profit Margin is calculated by dividing Net Income by Sales.

Management is interested in having high profit margins.

> EXAMPLE — Net Income for the year was $ 60,000 and Sales were $ 480,000. Profit Margin is $ 60,000 / $ 480,000 or 12.5%. For each dollar of sales, we generated $ .125 of profits.

Asset Turnover measures the percent of sales you are able to generate from your assets. Asset Turnover reflects the level of capital we have tied-up in assets and how much sales we can squeeze out of our assets. Asset Turnover is calculated by dividing Sales by Average Assets. A high asset turnover rate implies that we can generate strong sales from a relatively low level of capital. Low turnover would imply a very capital-intensive organization.

> EXAMPLE — Sales for the year were $ 480,000, beginning total assets was $ 505,000 and year-end total assets are $ 495,000. The Asset Turnover Rate is $

480,000 / $ 500,000 (average total assets which is $ 505,000 + $ 495,000 / 2) or .96. For every $ 1.00 of assets, we were able to generate $ .96 of sales.

Financial Leverage is the third and final component of Return on Equity. Financial Leverage is a measure of how much we use equity and debt to finance our assets. As debt increases, we financial leverage increases. Generally, management tends to prefer equity financing over debt since it carries less risk. The Financial Leverage Ratio is calculated by dividing Assets by Shareholder Equity.

EXAMPLE — Average assets are $ 500,000 and average shareholder equity is $ 320,000. Financial Leverage Ratio is $ 500,000 / $ 320,000 or 1.56. For each $ 1.56 in assets, we are using $ 1.00 in equity financing.

Now let us compare our Return on Equity to a combination of the three component ratios:

From our example, Return on Equity = $ 60,000 / $ 320,000 or 18.75% or we can combine the three components of Return on Equity from our examples:

Profit Margin x Asset Turnover x Financial Leverage = Return on Equity or .125 x .96 x 1.56 = 18.75%.

Now that we understand the basic ratio structure, we can move down to a more detail analysis with ratios. Four common groups of detail ratios are: Liquidity, Asset Management, Profitability and Leverage. We will also look at market value ratios.

Chapter 2: Liquidity Ratios

Liquidity Ratios help us understand if we can meet our obligations over the short-run. Higher liquidity levels indicate that we can easily meet our current obligations. We can use several types of ratios to monitor liquidity.

Current Ratio

Current Ratio is simply current assets divided by current liabilities. Current

assets include cash, accounts receivable, marketable securities, inventories, and prepaid items. Current liabilities include accounts payable, notes payable, salaries payable, taxes payable, current maturity's of long-term obligations and other current accruals.

> EXAMPLE — Current Assets are $ 200,000 and Current Liabilities are $ 80,000. The Current Ratio is $ 200,000 / $ 80,000 or 2.5. We have 2.5 times more current assets than current liabilities.

A low current ratio would imply possible insolvency problems. A very high current ratio might imply that management is not investing idle assets productively. Generally, we want to have a current ratio that is proportional to our operating cycle. We will look at the Operating Cycle as part of asset management ratios.

Acid Test or Quick Ratio

Since certain current assets (such as inventories) may be difficult to convert into cash, we may want to modify the

Current Ratio. Also, if we use the LIFO (Last In First Out) Method for inventory accounting, our current ratio will be understated. Therefore, we will remove certain current assets from our previous calculation. This new ratio is called the Acid Test or Quick Ratio; i.e. assets that are quickly converted into cash will be compared to current liabilities. The Acid Test Ratio measures our ability to meet current obligations based on the most liquid assets. Liquid assets include cash, marketable securities, and accounts receivable. The Acid Test Ratio is calculated by dividing the sum of our liquid assets by current liabilities.

EXAMPLE — Cash is $ 5,000, Marketable Securities are $ 15,000, Accounts Receivable are $ 40,000, and Current Liabilities are $ 80,000. The Acid Test Ratio is ($ 5,000 + $ 15,000 + $ 40,000) / $ 80,000 or .75. We have $ .75 in liquid assets for each $ 1.00 in current liabilities.

Defensive Interval

Defensive Interval is the sum of liquid assets compared to our expected daily cash outflows. The Defensive Interval is calculated as follows:

(Cash + Marketable Securities + Receivables) / Daily Operating Cash Outflow

> EXAMPLE — Referring back to our last example, we have total quick assets of $ 60,000 and we have estimated that our daily operating cash outflow is $ 1,200. This would give us a 50 day defensive interval ($ 60,000 / $ 1,200). We have 50 days of liquid assets to cover our cash outflows.

Ratio of Operating Cash Flow to Current Debt Obligations

The Ratio of Operating Cash Flow to Current Debt Obligations places emphasis on cash flows to meet fixed debt obligations. Current maturities of long-term debts along with notes payable

comprise our current debt obligations. We can refer to the Statement of Cash Flows for operating cash flows. Therefore, the Ratio of Operating Cash Flow to Current Debt Obligations is calculated as follows:

Operating Cash Flow / (Current Maturity of Long-Term Debt + Notes Payable)

> EXAMPLE — We have operating cash flow of $ 100,000, notes payable of $ 20,000 and we have $ 5,000 in current obligations related to our long-term debt. The Operating Cash Flow to Current Debt Obligations Ratio is $ 100,000 / ($ 20,000 + $ 5,000) or 4.0. We have 4 times the cash flow to cover our current debt obligations.

Chapter 3: Asset Management Ratios

A second group of detail ratios is asset management ratios. Asset management ratios measure the ability of assets to generate revenues or earnings. They also

compliment our liquidity ratios. We looked at one asset management ratio already; namely Total Asset Turnover when we analyzed Return on Equity. We will now look at five more asset management ratios: Accounts Receivable Turnover, Days in Receivables, Inventory Turnover, Days in Inventory, and Capital Turnover.

Accounts Receivable Turnover

Accounts Receivable Turnover measures the number of times we were able to convert our receivables over into cash. Higher turnover ratios are desirable. Accounts Receivable Turnover is calculated as follows:

Net Sales / Average Accounts Receivable

> EXAMPLE — Sales are $ 480,000, the average receivable balance during the year was $ 40,000 and we have a $ 20,000 allowance for sales returns. Accounts Receivable Turnover is ($ 480,000 - $ 20,000) / $ 40,000 or 11.5. We were able to turn our receivables over 11.5 times during the year.

> NOTE — We are assuming that all of our sales are credit sales; i.e. we do not have any significant cash sales.

Days in Accounts Receivable

The Number of Days in Accounts Receivable is the average length of time required to collect our receivables. A low number of days is desirable. Days in Accounts Receivable is calculated as follows:

365 or 360 or 300 / Accounts Receivable Turnover

> EXAMPLE — If we refer to our previous example and we base our calculation on the full calendar year, we would require 32 days on average to collect our receivables. 365 / 11.5 = 32 days.

Inventory Turnover

Inventory Turnover is similar to accounts receivable turnover. We are measuring

how many times did we turn our inventory over during the year. Higher turnover rates are desirable. A high turnover rate implies that management does not hold onto excess inventories and our inventories are highly marketable. Inventory Turnover is calculated as follows:

Cost of Sales / Average Inventory

> EXAMPLE — Cost of Sales were $ 192,000 and the average inventory balance during the year was $ 120,000. The Inventory Turnover Rate is 1.6 or we were able to turn our inventory over 1.6 times during the year.

Days in Inventory

Days in Inventory is the average number of days we held our inventory before a sale. A low number of inventory days is desirable. A high number of days implies that management is unable to sell existing inventory stocks. Days in Inventory is calculated as follows:

365 or 360 or 300 / Inventory Turnover

> EXAMPLE — If we refer back to the previous example and we use the entire calendar year for measuring inventory, then on average we are holding our inventories 228 days before a sale. 365 / 1.6 = 228 days.

Operating Cycle

Now that we have calculated the number of days for receivables and the number of days for inventory, we can estimate our operating cycle. Operating Cycle = Number of Days in Receivables + Number of Days in Inventory. In our previous examples, this would be 32 + 228 = 260 days. So on average, it takes us 260 days to generate cash from our current assets.

If we look back at our Current Ratio, we found that we had 2.5 times more current assets than current liabilities. We now want to compare our Current Ratio to our Operating Cycle. Our turnover within the Operating Cycle is 365 / 260 or 1.40. This is lower than our Current Ratio of 2.5. This indicates that we have additional assets to cover the turnover of current

assets into cash. If our current ratio were below that of the Operating Cycle Turnover Rate, this would imply that we do not have sufficient current assets to cover current liabilities within the Operating Cycle. We may have to borrow short-term to pay our expenses.

Capital Turnover

One final turnover ratio that we can calculate is Capital Turnover. Capital Turnover measures our ability to turn capital over into sales. Remember, we have two sources of capital: Debt and Equity. Capital Turnover is calculated as follows:

Net Sales / Interest Bearing Debt + Shareholders Equity

> EXAMPLE — Net Sales are $ 460,000, we have $ 50,000 in Debt and $ 200,000 of Equity. Capital Turnover is $ 460,000 / ($ 50,000 + $ 200,000) = 1.84. For each $ 1.00 of capital invested (both debt and equity), we are able to generate $ 1.84 in sales.

Chapter 4: Profitability Ratios

A third group of ratios that we can use are profitability ratios. Profitability Ratios measure the level of earnings in comparison to a base, such as assets, sales, or capital. We have already reviewed two profitability ratios: Return on Equity and Profit Margin. Two other ratios we can use to measure profitability are Operating Income to Sales and Return on Assets.

Operating Income to Sales

Operating Income to Sales compares Earnings Before Interest and Taxes (EBIT) to Sales. By using EBIT, we place more emphasis on operating results and we more closely follow cash flow concepts. Operating Income to Sales is calculated as follows:

EBIT / Net Sales

> EXAMPLE — Net Sales are $ 460,000 and Earnings Before Interest and Taxes is $

100,000. This gives us a return of 22% on sales, $ 100,000 / $ 460,000 = .22. For every $ 1.00 of sales, we generated $ .22 in Operating Income.

Return on Assets

Return on Assets measures the net income returned on each dollar of assets. This ratio measures overall profitability from our investment in assets. Higher rates of return are desirable. Return on Assets is calculated as follows:

Net Income / Average Total Assets

EXAMPLE — Net Income is $ 60,000 and average total assets for the year are $ 500,000. This gives us a 12% return on assets, $ 60,000 / $ 500.000 = .12.

Return on Assets is often modified to ensure accurate measurement of returns. For example, we may want to deduct out preferred dividends from Net Income or maybe we should include operating assets only and exclude intangibles,

investments, and other assets not managed for an overall rate of return.

Chapter 5: Leverage Ratios

Another important group of detail ratios are Leverage Ratios. Leverage Ratios measure the use of debt and equity for financing of assets. We previously looked at the Financial Leverage Ratio as part of Return on Equity. Three other leverage ratios that we can use are Debt to Equity, Debt Ratio, and Times Interest Earned.

Debt to Equity

Debt to Equity is the ratio of Total Debt to Total Equity. It compares the funds provided by creditors to the funds provided by shareholders. As more debt is used, the Debt to Equity Ratio will increase. Since we incur more fixed interest obligations with debt, risk increases. On the other hand, the use of debt can help improve earnings since we get to deduct interest expense on the tax return. So we want to balance the use of debt and equity such that we maximize

our profits, but at the same time manage our risk. The Debt to Equity Ratio is calculated as follows:

Total Liabilities / Shareholders Equity

> EXAMPLE — We have total liabilities of $ 75,000 and total shareholders equity of $ 200,000. The Debt to Equity Ratio is 37.5%, $ 75,000 / $ 200,000 = .375. When compared to our equity resources, 37.5% of our resources are in the form of debt.
>
> KEY POINT — As a general rule, it is advantageous to increase our use of debt (trading on the equity) if earnings from borrowed funds exceeds the costs of borrowing.

Debt Ratio

The Debt Ratio measures the level of debt in relation to our investment in assets. The Debt Ratio tells us the percent of funds provided by creditors

and to what extent our assets protect us from creditors. A low Debt Ratio would indicate that we have sufficient assets to cover our debt load. Creditors and management favor a low Debt Ratio. The Debt Ratio is calculated as follows:

Total Liabilities / Total Assets

EXAMPLE — Total Liabilities are $ 75,000 and Total Assets are $ 500,000. The Debt Ratio is 15%, $ 75,000 / $ 500,000 = .15. 15% of our funds for assets comes from debt.

NOTE — We use Total Liabilities to be conservative in our assessment.

Times Interest Earned

Times Interest Earned is the number of times our earnings (before interest and taxes) covers our interest expense. It represents our margin of safety in making fixed interest payments. A high ratio is desirable from both creditors and management. Times Interest Earned is calculated as follows:

Earnings Before Interest and Taxes / Interest Expense

> EXAMPLE — Earnings Before Interest Taxes is $ 100,000 and we have $ 10,000 in Interest Expense. Times Interest Earned is 10 times, $ 100,000 / $ 10,000. We are able to cover our interest expense 10 times with operating income.

Chapter 6: Market Value Ratios

One final group of detail ratios that warrants some attention is Market Value Ratios. These ratios attempt to measure the economic status of the organization within the marketplace. Investors use these ratios to evaluate and monitor the progress of their investments.

Earnings Per Share

Growth in earnings is often monitored with Earnings per Share (EPS). The EPS

expresses the earnings of a company on a "per share" basis. A high EPS in comparison to other competing firms is desirable. The EPS is calculated as:

Earnings Available to Common Shareholders / Number of Common Shares Outstanding

> EXAMPLE — Earnings are $ 100,000 and preferred stock dividends of $ 20,000 need to be paid. There are a total of 80,000 common shares outstanding. Earnings per Share (EPS) is ($ 100,000 - $ 20,000) / 80,000 shares outstanding or $ 1.00 per share.

P / E Ratio

The relationship of the price of the stock in relation to EPS is expressed as the Price to Earnings Ratio or P / E Ratio. Investors often refer to the P / E Ratio as a rough indicator of value for a company. A high P / E Ratio would imply that investors are very optimistic (bullish) about the future of the company since the

price (which reflects market value) is selling for well above current earnings. A low P / E Ratio would imply that investors view the company's future as poor and thus, the price the company sells for is relatively low when compared to its earnings. The P / E Ratio is calculated as follows:

Price of Stock / Earnings per Share *

* Earnings per Share are fully diluted to reflect the conversion of securities into common stock.

> EXAMPLE — Earnings per share is $ 3.00 and the stock is selling for $ 36.00 per share. The P / E Ratio is $ 36 / $ 3 or 12. The company is selling for 12 times earnings.

Book Value per Share

Book Value per Share expresses the total net assets of a business on a per share basis. This allows us to compare the book values of a business to the stock price and gauge differences in valuations. Net

Assets available to shareholders can be calculated as Total Equity less Preferred Equity. Book Value per Share is calculated as follows:

Net Assets Available to Common Shareholders * / Outstanding Common Shares

* Calculated as Total Equity less Preferred Equity.

> EXAMPLE — Total Equity is $ 5,000,000 including $ 400,000 of preferred equity. The total number of common shares outstanding is 80,000 shares. Book Value per Share is ($ 5,000,000 - $ 400,000) / 80,000 or $ 57.50

Dividend Yield

The percentage of dividends paid to shareholders in relation to the price of the stock is called the Dividend Yield. For investors interested in a source of income, the dividend yield is important since it gives the investor an indication of how much dividends are paid by the

company. Dividend Yield is calculated as follows:

Dividends per Share / Price of Stock

> EXAMPLE — Dividends per share are $ 2.10 and the price of the stock is $ 30.00 per share. The Dividend Yield is $ 2.10 / $ 30.00 or 7%

Chapter 7: Comparing Financial Statements

One final way of evaluating financial performance is to simply compare financial statements from period to period and to compare financial statements with other companies. This can be facilitated by vertical and horizontal analysis.

Vertical Analysis

Vertical analysis compares line items on a financial statement over an extended period of time. This helps us spot trends and restate financial statements to a common size for quick analysis. For the

Balance Sheet, we will use total assets as our base (100%) and for the Income Statement, we will use Sales as our base (100%). We will compare different line items on the financial statements to these bases and express the line items as a percentage of the base.

EXAMPLE — Income Statements for the last three years are summarized below:

	1990	1991	1992
Sales	$ 300,000	$ 310,000	$ 330,000
Cost of Goods Sold	(110,000)	(105,000)	(110,000)
G & A Expenses	(80,000)	(100,000)	(105,000)
Net Income	$ 110,000	$ 105,000	$ 115,000

< - - - - - - - Vertical Analysis - - - - - - - - - - >

	1990	1991	1992
Sales	100%	100%	100%
Cost of Goods Sold	37%	34%	33%

G & A Expenses   27%
32%   32%
Net Income   37%
34%   35%

By expressing balances as percentages, we can easily notice that G & A Expenses are trending up while Cost of Goods Sold is moving down. This may require further analysis to determine what is behind these trends.

Horizontal Analysis

Horizontal analysis looks at the percentage change in a line item from one period to the next. This helps us identify trends from the financial statements. Once we spot a trend, we can dig deeper and investigate why the change occurred. The percentage change is calculated as:

(Dollar Amount in Year 2 - Dollar Amount in Year 1) / Dollar Amount in Year 1

EXAMPLE — Sales were $ 310,000 in 1991 and $ 330,000

in 1992. The percentage change in sales is:

($ 330,000 - $ 310,000) / $ 310,000 = 6.5%

We can apply this analysis "horizontally" down the financial statement for the year 1992:

Sales   6.5%
Cost of Goods Sold   4.8%
G & A Expenses   5.0%
Net Income   9.5%

Summary

We started our look at ratio analysis with Return on Equity since this one ratio is at the heart of financial management; namely we want to maximize returns for the shareholders of the company. Secondly, we have three ways of influencing Return on Equity. We can change our profit margins, we can change our turnover of assets, or we can change our use of financial leverage. Next, we looked at how we can influence

the three components of Return on Equity.

There are several detail ratios that we can monitor, such as acid test, inventory turnover, and debt to equity. Detail ratios help us monitor specific financial conditions, such as liquidity or profitability.

Ratios are best used when compared or benchmarked against another reference, such as an industry standard or "best in class" within our industry. This type of comparison helps us establish financial goals and identify problem areas.

We also can use vertical and horizontal analysis for easy identification of changes within financial balances.

It should be noted that ratios do have limitations. After all, ratios are usually derived from financial statements and financial statements have serious limitations. Additionally, comparisons are usually difficult because of operating and financial differences between companies. None-the-less, if you want to analyze a set of financial statements, ratio analysis is probably one of the most popular approaches to understanding financial performance.

Final Exam

Select the best answer for each question. Exams are graded and administered over the internet at www.exinfm.com/training.

1. Which ratio is best used for measuring how well management did in managing the funds provided by shareholders?

    a. Profit Margin

    b. Debt to Equity

    c. Return on Equity

    d. Inventory Turnover

2. If sales are $ 600,000 and assets are $ 400,000, then asset turnover is:

    a. .67

    b. 1.50

    c. 2.00

    d. 3.50

3. An extremely high current ratio implies:

    a. Management is not investing idle assets productively.

    b. Current assets have been depleted and the company is insolvent.

c. Total assets are earning a very low rate of return.

d. Current liabilities are higher than current assets.

4. If we have cash of $ 1,500, accounts receivables of $ 25,500 and current liabilities of $ 30,000, our quick or acid test ratio would be:

a. 1.88

b. 1.33

c. 1.11

d. .90

5. The number of times we convert receivables into cash during the year is measured by:

a. Capital Turnover

b. Asset Turnover

c. Accounts Receivable Turnover

d. Return on Assets

6. If our cost of sales are $ 120,000 and our average inventory balance is $ 90,000, then our inventory turnover rate is:

a. .50

b. .75

c. 1.00

d. 1.33

7. We can estimate our Operating Cycle by taking the sum of:

a. Receivable Turnover + Inventory Turnover

b. Days in Receivables + Days in Inventory

c. Asset Turnover + Return on Sales

d. Days in Sales + Days in Assets

8. If Operating Income (Earnings Before Interest Taxes) is $ 63,000 and Net Sales are $ 900,000, then Operating Income to Sales is:

a. 18%

b. 12%

c. 7%

d. 4%

9. If the price of the stock is $ 45.00 and the Earnings per Share is $ 9.00, then the P / E Ratio is:

a. 2

b. 5

c. 9

d. 15

10. Net Income for 1996 was $ 400,000 and Net Income for 1997 was $ 420,000. The percentage change in Net Income is:

a. 1%

b. 3%

c. 5%

d. 10%