

## 1. INTRODUCTION

Financial statement analysis involves analysing the information provided in the financial statements. Financial analytical tools can be used to assess company's:

- Past performance
- Present condition
- Future performance

### Sources of data include:

- Company's financial statements
- Notes to financial statements
- Management commentary (operating & financial review or management's discussion and analysis)

Financial statements provide data about the past performance (income, cash flows) and current financial condition (assets, liabilities, equity). However, in order to forecast future results, analysts must use other information available in company's financial reports and information on the economy, industry and comparable companies.

### Equity v/s Credit Analysis:

**Equity Analysis:** It involves an owner's perspective either for valuation or performance evaluation. It is used to assess the ability of a company to generate and grow earnings and cash flows and any risks associated with it. Its focus is on the growth of a company.

**Credit Analysis:** It involves a creditor's (e.g. banker or bondholder) perspective. Its major focus is to evaluate risks of a company and its long-term cash flows.

## 2. THE FINANCIAL ANALYSIS PROCESS

An effective analysis includes both computation and interpretation. In order to perform an effective financial statement analysis, an analyst needs to know:

- Purpose & objective of the analysis and steps required to meet those objectives.
- Company's annual report and other sources of

information available.

- How to process, analyze the data and communicate the results of analysis.

## 3. ANALYTICAL TOOLS AND TECHNIQUES

The commonly used tools for financial statement analysis are:

- Financial Ratio Analysis
- Comparative financial statements analysis:
  - Horizontal analysis/Trend analysis
  - Vertical analysis/Common size analysis/Component Percentages

Ratios and common size financial statements remove size as a factor and thus help in comparing different companies.

### For comparison purposes:

- Financial statements reported in different currencies can be translated into a common currency using exchange rate at the end of a period or using average exchange rates.
- For differences in fiscal year end, trailing twelve months data can be used.

- For differences in accounting standards, analysts must make adjustments.

**Practice: Example 2, Volume 3, Reading 20.**



### 3.1 Ratios

Ratio analysis involves both interpretation and computation of ratios using information from one or more financial statement(s).

#### 3.1.2) Value, Purposes and Limitations of Ratio Analysis

#### Uses of ratio Analysis:

Financial statement ratios provide a method of standardization (i.e. it removes/reduces the effect of size), which facilitates comparison across different companies.

Financial statement ratio analysis can be used to evaluate past performance, current financial position and future performance of a company (i.e. predicting future earnings and equity returns).

Financial statement ratios provide information about firm's:

- Economic characteristics i.e. changes in the company or industry over time
- Competitive strategies
- Financial flexibility
- Ability of management
- Peer companies

Financial statement ratios can be used for making investment decisions and in forecasting financial distress of a firm.

Ratios also express relationships between different financial statements.

#### Limitations of Ratios:

- Heterogeneity or homogeneity of a company's operating activities i.e. when a company has divisions operating in different industries, it is difficult to obtain comparable industry ratios for comparison purposes.
- A ratio is an indicator of some aspect of a company's performance *in the past*. It does not reveal **why** things are as they are. Also a single ratio by itself is not likely to be very useful.
- Ratio analysis may not provide consistent results.
- There is no one definitive set of key ratios and there is no uniform definition for all ratios.
- There are no standard rules regarding the interpretation of financial ratios and they require judgment.
- Differences in accounting policies can distort ratios (e.g. inventory valuation, depreciation methods).
- Not all ratios are necessarily relevant for a particular analysis.
- Financial ratios provide misleading results when companies manipulate or misrepresent their financial information.
- Financial ratios are based on historical results. Thus, they are not always useful to predict future performance.
- It is difficult to determine the target or comparison value for a ratio; thus, analyst has to use some range of acceptable values.

#### NOTE:

Individual ratio values are not meaningful in isolation. They are only valid when compared to those of other firms or to the company's historical performance.

#### 3.1.3) Sources of Ratios

Ratios can be computed using data from financial statements or from databases i.e. Bloomberg.

- Analysts should consider that database providers use judgment in classifying different items.
- Analysts should assess the consistency of formulas and data classifications used by the data sources.

**Practice: Example 3 & 4,  
Volume 3, Reading 20.**



### 3.2 Common-Size Analysis

Common size financial statements can be used for performing cross sectional and time series analysis because they remove the effects of differences in firm size.

- 1) **Vertical Common size analysis:** All items are expressed as a percentage of a common base item within a financial statement.
- 2) **Horizontal analysis** involves comparing a specific financial statement with prior or future periods or to a cross-sectional analysis of a company.

#### 3.2.1) Common-size Analysis of the Balance Sheet

##### Uses of common size balance sheet:

- 1) To identify trends in a company's balance sheet components over time.
- 2) To compare balance sheet components of similar firms e.g. is this firm holding more debt than similar organizations?

A **vertical common size balance sheet** expresses each item on the balance sheet as a percentage of total assets.

It indicates the composition of the balance sheet e.g. increase in A/R as percentage of total assets may indicate:

- Increase in sales on a credit basis.
- Credit standards have been lowered by the company.
- Collection procedures have been relaxed.
- Use of more aggressive revenue recognition policies.

A **horizontal common-size balance sheet** represents the increase or decrease in percentage terms of each balance sheet item from prior year or it can be prepared by dividing each item by a base-year quantity of that item.

- It indicates structural changes in the business.
- It helps in assessing the stability of past trends and chances of change in direction in future.

**For example:**

Period 1 cash = \$39 million  
 Period 2 cash = \$29 million  
 Period 3 cash = \$27 million

- This implies that in period 2, company has  $29 / 39 = 0.74$  or 74% of the amount of cash it had in period 1.
- In period 3, it has  $27 / 39 = 0.69$  or 69% of the amount of cash it had in period 1.

**Example of percentage change in each item:**

Change in cash from Period 1 to 2 =  $(29 / 39) - 1 = -25.6\%$

Change in cash from period 2 to 3 =  $(27 / 29) - 1 = -6.9\%$ .

**3.2.2) Common-Size Analysis of the Income Statement**

A *common-size income statement* expresses each income statement category as a percentage of total sales or revenues.

**3.2.3) Cross-sectional Analysis (a.k.a Relative analysis)**

It involves comparing company's performance with another company or group of companies. It removes the effects of differences in firm size and currencies.

**3.2.4) Trend Analysis**

Trend analysis involves analyzing trends in the data i.e. analyzing whether they are deteriorating or improving. It provides important information regarding historical performance and growth of a company. Analyzing past trends is more useful for stable and mature companies and when macroeconomic and competitive environments are relatively stable.

**3.2.5) Relationship among Financial Statements**

We can compare the trend data generated by a horizontal common-size analysis across different financial statements e.g. we can compare growth of assets with revenue growth rate i.e. if growth rate of revenue > assets growth rate, it may indicate that company is increasing its efficiency. Similarly, when net income is growing at a faster rate than revenue, it may indicate that company's profitability is increasing. However, it is important to assess whether growth in net income is

attributed to continuing operations or non-operating/non-recurring items.

**Practice: Example 5,  
Volume 3, Reading 20.**

**NOTE:**

When the company grows at a rate greater than that of the overall market in which it operates, it is regarded as a positive sign and indicates that the company is easily able to attract equity capital.

**3.3 The Use of Graphs as an Analytical Tool**

- 1) Graphs facilitate in comparing performance and financial structure of a company over time.
- 2) Graphs help to identify significant aspects of business operations.
- 3) Graphs provide a graphical overview of risk trends of a business.
- 4) Graphs can be used to communicate conclusions regarding financial condition and risk management aspects of a firm.

**Pie Charts:** Pie charts can be used to show the composition of a total value.

**Line Graphs:** Line graphs can be used to present the change in amounts for a limited number of items over a relatively longer time period. They also illustrate growth trends in key financial variables.

**Stacked Column Graph:** Stacked column graph can be used to present the composition, amounts and changes in amounts over time.

**3.4 Regression Analysis**

Regression analysis can be used to identify relationships (correlation) between variables.

- For example, in order to evaluate whether the company is cyclical or non-cyclical, regression analysis can be used to identify relationship between company's sales and GDP over time.
- Regression analysis is also helpful in predicting future.

**4. COMMON RATIOS USED IN FINANCIAL ANALYSIS**

Financial Ratios can be classified into five main categories:

**1) Activity Ratios:** Activity ratios measure the efficiency of managing assets in day-to-day operations i.e. how effectively assets are being used by the company e.g. collection of A/R and inventory management etc.

**2) Liquidity ratios:** Liquidity ratios measure firm's ability to meet short-term obligations. They also measure how quickly assets are converted into cash.

**3) Solvency ratios:** Solvency ratios measure firm's ability to meet long-term obligations. They include leverage and long-term debt ratios.

**4) Profitability ratios:** Profitability ratios measure the overall performance and profitability of the firm.

**5) Valuation ratios:** Valuation ratios measure the amount of an asset or earnings associated with ownership of a specified claim e.g. share or ownership of the enterprise.

Note that these categories are not distinct i.e. activity ratios also indicate liquidity of a company because collection of A/R results in increase in cash. Similarly, some profitability ratios also reflect operating efficiency of a firm.

#### 4.1 INTERPRETATION AND CONTEXT

Financial ratios are used in:

- Cross-sectional analysis i.e. comparing ratios of a firm with those of its major competitors.
- Trend analysis i.e. comparing ratios of a firm with its prior periods.

Financial Ratios should be evaluated based on the following factors:

1. Company goals and strategy: Ratios should be compared with the company's goals & strategy.
2. Industry norms or Cross-sectional analysis and Trend analysis i.e. comparing ratios of a firm with those of its major competitors.
3. Economic conditions: Ratios should be evaluated by considering the current phase of business cycle e.g. for cyclical companies, financial ratios tend to improve (deteriorate) when the economy is strong (weak).

#### 4.2 Activity Ratios

Activity ratios are also known as asset utilization ratios or operating efficiency ratios.

$$\text{Inventory Turnover Ratio} = \frac{\text{COGS}}{\text{Average Inventory}}$$

- It measures the efficiency of the firm in managing and selling inventory.
- High ratio represents efficient inventory management i.e. fewer funds tied up in inventories.
- High inventory can also indicate under-stocking and lost orders.
- Slower growth combined with higher inventory turnover may indicate inadequate inventory levels.
- Low turnover can also indicate valid reasons i.e. preparing for a strike, increased demand, etc.

**NOTE:**

- Quarterly turnover ratio can be annualized as follows: Quarterly turnover ratio  $\times$  (12 / 3) or Quarterly turnover ratio  $\times$  (365 / 90).
- In case of rapidly increasing costs, COGS for the 4<sup>th</sup> quarter should be used.

$$\text{Days of Inventory on hand (DOH) = Average \# of days inventory in stock} = \frac{365}{\text{Inventory Turnover Ratio}}$$

- Low ratio represents efficient inventory management.
- Low ratio can also indicate under-stocking and lost orders.

$$\text{Receivable Turnover Ratio} = \frac{\text{Sales or Revenue}}{\text{Average receivables}}$$

- Relatively low turnover ratio may indicate inefficiency, decrease in demand, or earnings manipulations.

**NOTE:**

When available, credit sales should be used instead of net sales since credit sales produce the receivables.

$$\text{Days of Sales Outstanding (DOS) = Average \# of days receivable are outstanding} = \frac{365}{\text{Receivable Turnover}}$$

- It provides information about the firm's credit policy.
- It should be compared with the firm's stated credit policy i.e., if firm policy is 30 days and average collection period is 60 days, it indicates that company is not stringent in collection effort.
- It should be compared with that of industry i.e. low ratio relative to the industry may indicate efficient credit and collection; however, it may also indicate loss sales to competitors.

$$\text{Payable Turnover Ratio} = \frac{\text{Purchases*}}{\text{Average trade payables}}$$

- This ratio reflects how many times per year the company pay off all its creditors.
- High ratio (or low days payable) relative to industry may indicate that company is not making full use of available credit facilities or it may also indicate that company is taking advantage of early payment discounts.
- Low ratio (or high days payable) may indicate that company is facing problems in making payments on time or it may indicate that company is exploiting lenient supplier terms.

\*when not directly available, Purchases = COGS + Ending inventory – beginning inventory or we can use COGS.

$$\text{Number of Days of Payables} = \frac{365}{\text{Payable Turnover}}$$

- This ratio reflects the average number of days the company takes to pay its suppliers.

$$\text{Working Capital Turnover} = \frac{\text{Revenue}}{\text{Average Working Capital}}$$

where,

Working capital = Current assets – Current liabilities.

- Working capital turnover reflects the company's efficiency in generating revenue from its working capital.
- Higher ratio indicates greater efficiency.
- When this ratio is zero or negative, it is meaningless to interpret.

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Sales or Revenues}}{\text{Average net fixed assets}}$$

- It is a measure of the relation between sales and investments in long-lived assets.
- Fixed assets turnover reflects the company's efficiency in generating revenue with its investments in fixed assets.
- Higher ratio indicates greater efficiency.
- Lower ratio indicates inefficiency.
- Lower ratio may also indicate that the company has newer assets (i.e. reported at higher carrying value on B/S due to lower depreciation expense).

$$\text{Total Assets Turnover Ratio} = \frac{\text{Sales}}{\text{Average total assets}}$$

- Total assets turnover reflects the company's overall efficiency in generating revenue with its given level of assets.
- Higher ratio indicates greater efficiency.
- When the asset turnover ratios are low, relative to the industry or historical record, it indicates inefficiencies or it may indicate that either the investment in assets is too heavy and/or sales are slow, or it may be possible that the firm may have taken an extensive plant modernization.

#### NOTE:

Average can be computed as follows:

- For annual data, average can be taken over two data points i.e. beginning & ending of year.
- For semi-annual data, average can be taken over three data points i.e. beginning, middle & ending of year.
- For quarterly data, average can be taken over 5 data points i.e. beginning of year and end of each quarter or for 4 data points i.e. end of each quarter.

**Practice:** Example 6, 7 & 8,  
Volume 3, Reading 20.



## 4.3

### Liquidity Ratios

Following Liquidity ratios reflect company's liquidity position at a specific point in time.

**Cash Conversion Cycle:** It reflects the number of days a company's cash is tied up by its current operating cycle. It is calculated as follows:

**Cash Conversion Cycle or Net Operating cycle =**

Number of days inventory in stock + Number of days receivable are outstanding – Number of days accounts payable are outstanding = DOH + DSO - Number of days accounts payable are outstanding

- A short cash conversion cycle indicates a higher level of liquidity.

$$\text{Current Ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

- A higher ratio indicates a higher level of liquidity.

$$\text{Quick Ratio} = \frac{\text{Cash} + \text{Marketable securities} + \text{Receivables}}{\text{Current Liabilities}}$$

- A higher quick ratio indicates a higher level of liquidity.
- The quick ratio is more conservative relative to current ratio because it includes only the more liquid current assets i.e. it ignores inventory. Therefore, in situations when inventories are illiquid, quick ratio is a better indicator of liquidity compared to current ratio.

$$\text{Cash Ratio} = \frac{\text{Cash} + \text{Marketable securities}}{\text{Current Liabilities}}$$

- A higher ratio indicates a higher level of liquidity.
- It is a better indicator of liquidity in case of crisis situation.

**Defensive Interval ratio=**

$$\frac{\text{Cash} + \text{Marketable Securities} + \text{Accounts Receivables}}{\text{Daily Cash Expenditures} *}$$

- It reflects how long a company is able to pay off its daily cash expenses using only its existing liquid assets without any additional cash inflow.
- A higher ratio indicates a higher level of liquidity.

\*Daily expenditures = total cash expenditures / number of days in a period

where,

Total cash expenditures = sum of all expenses on I/S (e.g. COGS, general, and administrative expenses, R&D) – non-cash expenses (e.g. depreciation & amortization (without taxes))

**Practice:** Example 9 & 10,  
Volume 3, Reading 20.



#### 4.4 Debt & Solvency Ratios

##### Debt Financing and Coverage

The use of debt involves risk because debt involves fixed commitment (interest charges & principal repayment). However, use of debt also introduces the potential for increased benefits to the firm's owners.

**Operating leverage:** It arises from usage of fixed costs in conducting the company's business. Operating leverage tends to **magnify** the effect of changes in sales on operating income of a company. Profitable companies may use operating leverage because when revenues ↑, their operating income ↑ at a higher rate because of operating leverage.

- Greater the operating leverage, greater the risk and lower will be a company's capacity to use financial leverage.

**Financial leverage:** It arises due to use of debt. Financial leverage tends to magnify the effect of changes in EBIT on equity holders returns.

- When return earned by a company > cost of debt, use of debt leads to decrease in overall cost of capital of a company; thus, increases returns to equity-holders.
- Evaluating company's use of debt helps analysts to understand company's future business prospects e.g. the issuance of long-term debt to repurchase common shares may indicate that according to company's management, shares of company are undervalued.
- It must be stressed that use of high financial leverage (i.e. greater debt financing) is regarded as less risky for companies with steady cash flows compared to companies with volatile cash flows.

##### 4.4.1) Calculation of Solvency Ratios

##### Solvency Ratios:

$$\text{Debt-Capital Ratio} = \frac{\text{Total Debt}^*}{\text{Total Debt} + \text{Total Shareholders' Equity}}$$

- It measures the percentage of a company's capital (debt + equity) represented by debt.
- Higher the ratio, greater the financial risk of a company and weaker the solvency position.

$$\text{Debt - Assets (or Total Debt) Ratio} = \frac{\text{Total Debt}}{\text{Total Assets}}$$

- It reflects the percentage of total assets financed with debt.
- Generally, higher the debt, greater the financial risk of a company and weaker the solvency

position.

$$\text{Debt-Equity Ratio} = \frac{\text{Total Debt}^*}{\text{Total Shareholders' equity}}$$

- It measures the amount of debt capital relative to equity capital.
- Higher the ratio, greater the financial risk of a company and weaker the solvency position.

\*Debt = interest-bearing short-term debt + long-term debt, excluding liabilities such as accrued expenses and accounts payable

##### Financial Leverage Ratio (or Leverage Ratio)=

$$\frac{\text{Average Total Assets}}{\text{Average Total Shareholders' equity}}$$

- It measures the amount of total assets supported by one money unit of equity.
- Higher ratio indicates greater amount of debt and thus, weaker solvency.

##### Coverage Ratios:

##### Interest Coverage (or Times interest earned) =

$$\frac{\text{Operating profit (EBIT)}}{\text{Interest payments}}$$

- It reflects the number of times a company is able to pay off its interest payments (service its debt) with its EBIT (operating income).
- Higher ratio indicates stronger solvency.

$$\text{Fixed charge coverage} = \frac{\text{EBIT} + \text{Lease payments}}{\text{Interest Payments} + \text{Lease payments}}$$

- It reflects the number of times a company is able to pay off its interest and lease payments with its earnings (before interest, taxes and lease payments).
- Higher ratio indicates stronger solvency.
- The ratio also indicates quality of the preferred dividend i.e. a higher ratio indicates a more secure preferred dividend.

##### NOTE:

Lease payments are added to numerator because they were deducted to calculate operating profits.

**Practice:** Example 11,  
Volume 3, Reading 20.



#### 4.5 Profitability Ratios

Profitability ratios reflect profit (return) earned by the company *during* a period.

#### 4.5.1) Calculation of Profitability Ratios

**Return on sales Profitability Ratios:** These ratios measure income relative to revenues and include:

$$\text{Gross Profit Margin} = \frac{\text{Gross profit}}{\text{Revenue}}$$

- It reflects the percentage of revenue available to pay operating and other expenses and to generate profit.
- It measures the ability of the firm to control costs of inventories and/or manufacturing cost and the ability to pass increases in input price to customers through sales.
- Higher gross profit margin indicates higher profit either due to higher product pricing or lower product costs or both.
- Gross profit is inversely related to competition in the industry i.e. greater the competition, lower will be the ability to charge a higher price and lower the gross profit.

$$\text{Operating Profit Margin} = \frac{\text{Operating income}}{\text{Revenue}} = \frac{\text{Gross profit} - \text{operating costs}}{\text{Revenue}}$$

- When operating profit margin > gross profit margin, it indicates improvements in controlling operating costs i.e. administrative overheads.

$$\text{Pre-tax margin} = \frac{\text{EBT (earnings before tax but after interest)}}{\text{Revenue}}$$

- It reflects impact of leverage and other non-operating income & expenses on profitability of a company.

$$\text{Net Profit Margin} = \frac{\text{Net Income}}{\text{Revenue}}$$

- It measures overall profitability of the firm taking into account all items i.e. revenues, expenses, tax, interest, etc.
- It also indicates the firm's ability to control the level of expenses relative to revenues generated.

**Return on Investment Profitability Ratios:** These ratios measure income relative to assets, equity or total capital of a company. These include:

$$\text{Operating ROA} = \frac{\text{Operating income}}{\text{Average Total Assets}}$$

- It indicates company's profitability and efficiency in using assets to generate operating profits. Higher the ratio, better it is.

$$\text{Rate of return on assets (ROA)} = \frac{\text{Net income}}{\text{Average Total Assets*}}$$

- ROA measures the return earned by a company on its assets.

- The higher ratio indicates that more income is generated by a given level of assets.

\*ending or beginning assets can also be used.

- When a company has stable level of assets, all three measures of assets will provide almost same result.
- When level of assets are not stable i.e. growing or shrinking, the results will differ among the three measures.
- Generally, rule is to use **average** when the numerator of the ratio represents a number from income statement or cash flow statement and denominator of a ratio represents a number from balance sheet.
- For simplicity, average of the beginning and ending balance sheet amounts is taken. However, for a company with seasonal business, it is better to use average of interim periods (if available).

$$\text{Rate of return on Assets (ROA)} = \frac{\text{Net income} + \text{Interest expense (1-tax rate)}}{\text{Average Total Assets}}$$

- This ratio provides a performance measure that is independent of the financing of the firm's assets.

$$\text{Return on Total Capital} = \frac{\text{EBIT}}{\text{Short-term and long-term debt \& equity}}$$

- It measures the profit earned by a company on all of its capital employed.

$$\text{Return on Shareholders' Equity (ROE)} = \frac{\text{Net income}}{\text{Average Total Shareholders' Equity}}$$

- It measures the return earned by a company on its equity (i.e. common equity, preferred equity and minority equity).

$$\text{Rate of Return on Common Shareholders' Equity (ROE)} = \frac{\text{Net income} - \text{preferred dividends*}}{\text{Average Common Equity}}$$

\*because preferred dividends are a return to preferred equity

- It measures the return earned by a company on its common equity only.

**Practice: Example 12, 13 & 14, Volume 3, Reading 20.**



#### 4.6.2) DuPont Analysis: The Decomposition of ROE

DuPont analysis facilitates an analyst to evaluate the impact of leverage, profit margins, and turnover on shareholder returns, determine the reasons for changes

in ROE over time for a given company and for different companies in a given time period.

- The decomposition reflects ROE as a function of company's efficiency, operating profitability, taxes, and use of financial leverage.

Two variants of the DuPont analysis:

- 1) The original three-part approach
- 2) Extended five part system.

$$\text{ROA} = \frac{\text{Net income}}{\text{Average total Assets}} = \frac{\text{Net income}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Average total Assets}} = \text{Net profit margin} \times \text{Total asset turnover}$$

$$\text{ROE} = \frac{\text{Net income}}{\text{Average total Equity}} = \frac{\text{Net Income}}{\text{Average total Assets}} \times \frac{\text{Average total Assets}}{\text{Average total Equity}} = \text{ROA} \times \text{Leverage}$$

- When a company has no leverage, **ROE = ROA**.
- When borrowing rate < (>) marginal rate earned on investing the borrowed money in business, ROE would increase (decrease) as leverage increases.

### Three component disaggregation of ROE

$$\text{ROE} = \frac{\text{Net Income}}{\text{Average total Equity}} = \frac{\text{Net income}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Average total Assets}} \times \frac{\text{Average total Assets}}{\text{Average total Equity}}$$

$$= \text{Net profit margin} \times \text{Total asset turnover} \times \text{Leverage}$$

### Five component disaggregation of ROE:

$$\text{ROE} = \frac{\text{Net Income}}{\text{Average total Equity}} = \frac{\text{Net income}}{\text{EBT}} \times \frac{\text{EBT}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Average total Assets}} \times \frac{\text{Average total Assets}}{\text{Average total Equity}}$$

$$= \text{Tax burden} \times \text{Interest burden} \times \text{EBIT margin} \times \text{Total asset turnover} \times \text{Leverage}$$

- A higher value for the tax burden indicates a lower tax rate i.e. the company is able to retain a higher percentage of its pre-tax profits.
- Higher value of interest burden indicates lower borrowing costs (i.e. lower interest payments). Lower borrowing costs result in increase in ROE.
- EBIT margin reflects effects of operating margin on ROE.

#### NOTE:

EBIT margin can be decomposed into a non-operating component (EBIT/ Operating income) and an operating component (Operating income/ Revenue).

**Practice: Example 15 & 16, Volume 3, Reading 20.**



## 5.

## EQUITY ANALYSIS

### Methods used by analysts to estimate equity value of a company:

- Valuation ratios (e.g. the price-to-earnings or P/E ratio)
- Discounted cash flow approaches
- Residual income approaches (ROE compared with the cost of capital)

### Ratios used in equity analysis include:

$$1. \text{ Price-to-earnings} = \frac{\text{Price per share}}{\text{Earnings per share}}$$

- It reflects how much an investor in common stock pays per dollar of earnings.
- Due to use of net income, this ratio can be sensitive to non-recurring earnings.

$$2. \text{ Price-to-cash flow} = \frac{\text{Price per share}}{\text{Cash flow per share}}$$

$$3. \text{ Price-to-sales} = \frac{\text{Price per share}}{\text{Sales per share}}$$

$$4. \text{ Price-to-book value} = \frac{\text{Price per share}}{\text{Book value per share}}$$

- This ratio reflects relationship between a company's required rate of return and its actual rate of return.
- A ratio > 1 (< 1) would indicate that the future profitability of the company is expected to be greater (less) than the required rate of return.

$$\text{Basic EPS} = \frac{\text{Net income} - \text{preferred dividends}}{\text{weighted average number of ordinary shares outstanding}}$$

- It is not an appropriate measure for comparison purposes e.g. differences in EPS does not indicate differences in profitability among companies because companies may have identical profits, and differences in EPS only reflects differences in



number of common shares outstanding.

### Diluted EPS =

Net income available for ordinary shares after adjustments made for conversion of dilutive securities / weighted average number of ordinary and potential ordinary shares outstanding

### NOTE:

Calculations are discussed in Detail in Reading 25, section 6.

$$\text{Cash flow per share} = \frac{\text{Cash flow from operations}}{\text{weighted average number of shares outstanding}}$$

$$\text{EBITDA per share} = \frac{\text{EBITDA}}{\text{weighted average number of shares outstanding}}$$

- It can be used to remove the effect of different levels of fixed asset investment across companies.

### Dividends per share =

$$\frac{\text{Common dividends declared}}{\text{weighted average number of ordinary shares outstanding}}$$

$$\text{Dividend payout ratio} = \frac{\text{Common share dividends}}{\text{Net income attributable to common shares}}$$

- It measures the percentage of earnings that the company pays out as dividends to shareholders.

### Retention rate (b) =

$$\frac{\text{Net Income attributable to common shares} - \text{Common share dividends}}{\text{Net income attributable to common shares}}$$

- It reflects the percentage of earnings that the company retains.

**Sustainable growth rate of a firm:** A firm's sustainable growth rate can be calculated as follows:

$$\text{Sustainable growth rate} = \text{Earnings Retention Rate (b)} \times \text{ROE}$$

## 5.2 Industry-Specific Ratios

**Business Risk can be measured by following ratios:**

**Coefficients of variation:** It is used to measure the risk related to a firm's sales, operating income, and net income.

## 6. CREDIT ANALYSIS

Credit analysis refers to evaluating credit risk. It involves:

- Projecting period-by-period cash flows of a firm.
- Credit scoring i.e. a statistical analysis of the determinants of credit default.

### 1) Coefficients of variation of Operating income =

$$\frac{\text{S.D of operating income}}{\text{Average operating income}}$$

### 2) Coefficients of variation of Net income =

$$\frac{\text{S.D of Net income}}{\text{Average Net income}}$$

### 3) Coefficients of variation of Revenues = $\frac{\text{S.D of Revenue}}{\text{Average Revenue}}$

### Financial Sector Ratios include:

#### 1) Capital adequacy (for banks) =

Various components of capital / various measures i.e. risk-weighted assets, market risk exposure, level of operational risk assumed

#### 2) Monetary reserve requirements (Cash reserve ratio):

$$\frac{\text{Reserve held at central bank}}{\text{specified deposit liabilities}}$$

#### 3) Liquidity asset requirement =

$$\frac{\text{Approved "readily marketable" securities}}{\text{specified deposit liabilities}}$$

$$\text{4) Net Interest Margin} = \frac{\text{Net Interest Income}}{\text{Total interest-earning assets}}$$

### Retail Ratios:

1) **Same or comparable store sales** = Average revenue growth year over year for stores open in both periods

#### 2) Sales per square meter (or square foot) =

$$\frac{\text{Revenue}}{\text{Total retail space in square meters (or square feet)}}$$

### Service Companies:

$$\text{1) Revenue per employee} = \frac{\text{Revenue}}{\text{Total number of employees}}$$

$$\text{2) Net income per employee} = \frac{\text{Net income}}{\text{Total number of employees}}$$

### Hotel:

$$\text{1) Average daily rate} = \frac{\text{Room revenue}}{\text{Number of rooms sold}}$$

$$\text{2) Occupancy rate} = \frac{\text{Number of rooms sold}}{\text{Number of rooms available}}$$

### Ratios used in credit analysis include:

#### 1. EBIT interest coverage =

$$\frac{\text{EBIT}}{\text{Gross interest (prior to deduction for capitalized interest or interest income)}}$$

$$2. \text{ EBITDA interest coverage} = \frac{\text{EBITDA}}{\text{Gross interest (prior to deduction for capitalized interest or interest income)}}$$

$$3. \text{ FFO (Funds from Operations) interest coverage} = \frac{\text{FFO} + \text{interest paid} - \text{operating lease adjustments}}{\text{Gross interest (prior to deductions for capitalized interest or interest income)}}$$

$$4. \text{ Return on capital} = \frac{\text{EBIT}}{\text{Average capital}} = \frac{\text{EBIT}}{\text{Equity} + \text{Non current deferred taxes} + \text{Debt}}$$

$$5. \text{ FFO* (Funds from Operations) to debt} = \frac{\text{FFO}}{\text{Total debt}}$$

\*FFO = net income adjusted for non-cash items.

$$6. \text{ Free operating cash flow to debt} = \frac{\text{CFO (adjusted)} - \text{capital expenditures}}{\text{Total debt}}$$

$$7. \text{ Discretionary cash flow to debt} = \frac{\text{CFO} - \text{capital expenditures} - \text{Dividend paid}}{\text{Total debt}}$$

$$8. \text{ Net cash flow to capital expenditures} = \frac{\text{FFO} - \text{dividends}}{\text{Capital expenditures}}$$

$$9. \text{ Debt to EBITDA} = \frac{\text{Total debt}}{\text{EBITDA}}$$

$$10. \text{ Total debt to total debt plus equity} = \frac{\text{Total debt}}{\text{Total debt} + \text{Total equity}}$$

## 7. BUSINESS AND GEOGRAPHICAL SEGMENTS

**Segment Analysis:** In order to perform more detail analysis of a company's financial performance, analysts should analyze business segments and geographic segments separately.

### 7.1 Segment Reporting Requirements

- Companies are required to provide segment information under both IFRS and U.S. GAAP.
- A company is required to disclose separate information about any operating segment which meets certain quantitative criteria i.e. the segment constitutes 10% or more of the combined operating segment's revenue, assets, or profit.
- Information about smaller operating segments and businesses (that are not reported separately) is combined in "all other segments" category.
- Companies are required to:
  - Disclose the factors used to identify reportable segments and the types, products and services sold by each reportable segment.
  - Provide reconciliation between information of reportable segments and consolidated financial statements in terms of the revenue, profit/loss, assets and liabilities.
  - Disclose company's reliance on any single customer i.e. when a single customer represents 10% or more of the company's total revenues. Note that more concentrated customer base a company has, greater the risks.

### 7.2 Segment Ratios

$$1) \text{ Segment margin} = \frac{\text{Segment Profit (loss)}}{\text{Segment Revenue}}$$

- It measures the operating profitability of the segment relative to revenues.

$$2) \text{ Segment turnover} = \frac{\text{Segment Revenue}}{\text{Segment Assets}}$$

- It measures the overall efficiency of the segment i.e. amount of revenue generated per unit of assets.

$$3) \text{ Segment ROA} = \frac{\text{Segment Profit (loss)}}{\text{Segment Assets}}$$

- It measures operating profitability of the segment relative to assets.

$$4) \text{ Segment debt ratio} = \frac{\text{Segment Liabilities}}{\text{Segment Assets}}$$

- It reflects the solvency of the segment i.e. higher the ratio, greater the level of liabilities and weaker the solvency.

**Practice:** Example 17, Volume 3, Reading 20.



**8. MODEL BUILDING AND FORECASTING**

Ratio analysis along with other techniques can be used to construct pro-forma financial statements; based on a forecast of sales growth and assumptions regarding the relation between changes in key items of income statement and balance sheet items and growth of sales.

**Techniques of Forecasting include:**

**Sensitivity Analysis:** It is also known as 'what-if' analysis. It shows the effects of changes in any one input variable at a time and provides a range of possible outcomes based on those changes.

**Scenario analysis:** It can be used to examine several possible situations (e.g. worst case, base case or best case) and provides a range of outcomes based on **simultaneous** changes in key financial variables.

**Simulation:** It is an advanced form of scenario analysis. It involves using computer to make random choices for each variable input. Each event or possible outcome is assigned a predetermined probability. Using these probabilities, a probability distribution is obtained which is used to estimate risky outcomes and to calculate the expected return and standard deviation.

**Practice:** CFA Institute's end of Chapter Practice Problems and FinQuiz Questions.

