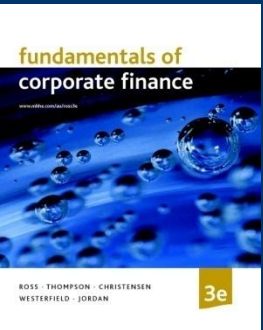




Chapter Two

Financial Statement Analysis

Chapter Organization



2.1 The Statement of Financial Position
(Balance Sheet)

2.2 The Statement of Financial Performance
(Income Statement)

2.3 Liquidity

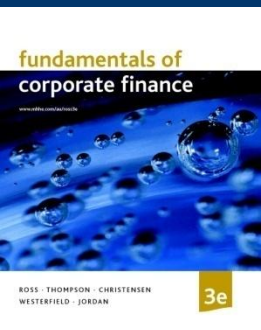
2.4 Book Value & Market Value

2.5 Financial Ratios

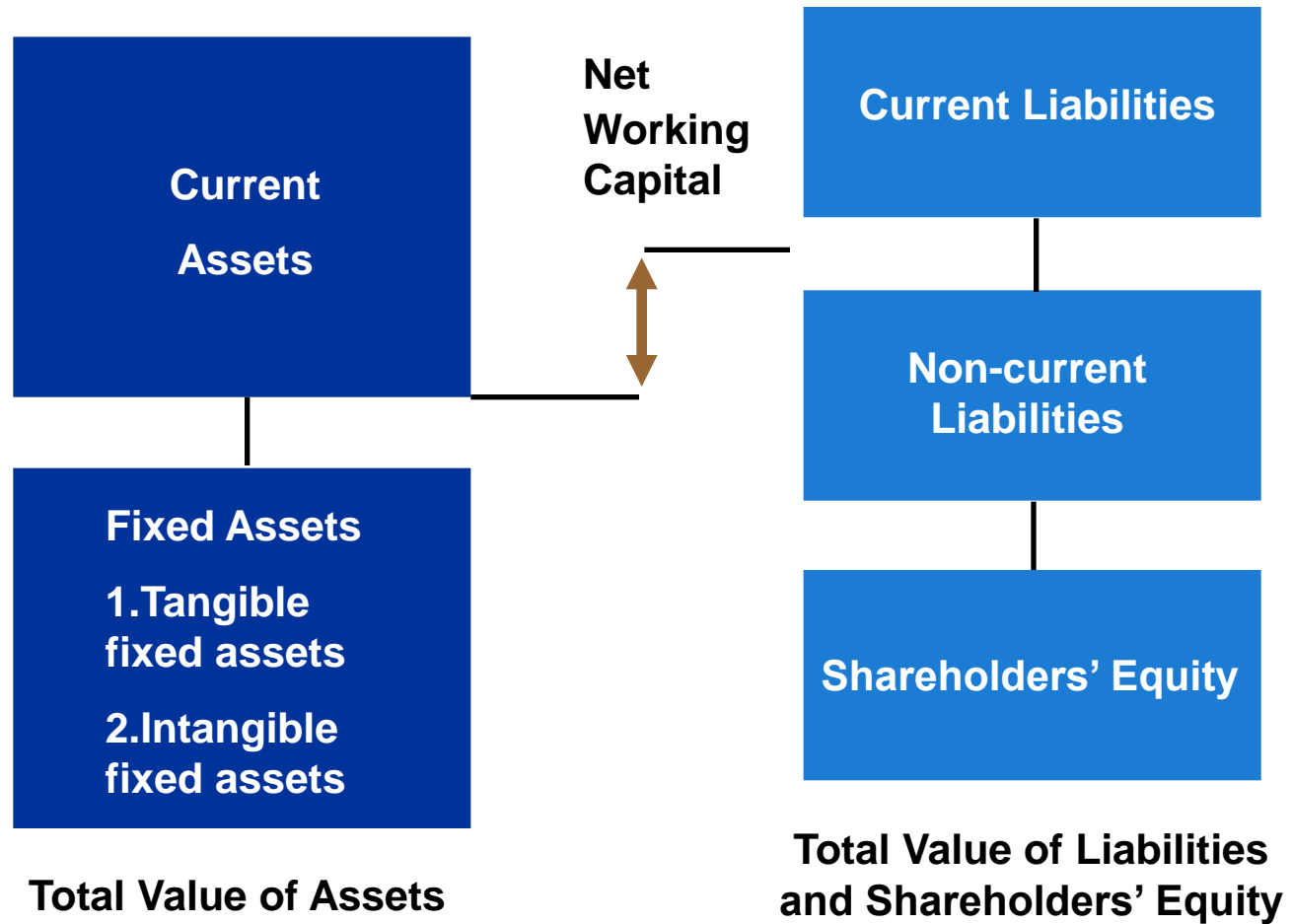
2.6 Test Questions & True/False Questions

The Balance Sheet

- The balance sheet is a snapshot of the firm's assets and liabilities at a given point in time.
- It is a convenient means of organizing and summarizing what a firm owns (its assets), what a firm owes (its liabilities), and the difference between the two (the firm's equity) at a given point in time.
- the left-hand side lists the assets of the firm, and the right-hand side lists the liabilities and Equity



The Statement of Financial Position (balance sheet)



Assets: The Left-Hand Side

- Assets are classified as either **current** or **fixed**.
- A fixed asset is one that has a relatively long life. Fixed assets can be either tangible, such as a truck or a computer, or intangible, such as a trademark or patent.
- Current asset has a life of less than one year. This means that the asset will convert to cash within 12 months. For example, inventory would normally be purchased and sold within a year and is thus classified as a current asset. Obviously, cash itself is a current asset. Accounts receivable (money owed to the firm by its customers) is also a current asset.



Liabilities and Owners' Equity: The Right-Hand Side



- The firm's liabilities are the first thing listed on the right-hand side of the balance sheet.
- These are classified as either current or long-term. Current liabilities, like current assets, have a life of less than one year (meaning they must be paid within the year) and are listed before long-term liabilities. Accounts payable (money the firm owes to its suppliers) is one example of a current liability.
- A debt that is not due in the coming year is classified as a long-term liability

Liabilities and Owners' Equity: The Right-Hand Side



- the difference between the total value of the assets (current and fixed) and the total value of the liabilities (current and long-term) is **the shareholders' equity**, also called common equity or owners' equity.
- This feature of the balance sheet is intended to reflect the fact that, if the firm were to sell all of its assets and use the money to pay off its debts, then whatever residual value remained would belong to the shareholders.
- So, the balance sheet “**balances**” because the value of the left-hand side always equals the value of the right-hand side.

The Balance Sheet Equation

- the value of the firm's assets is equal to the sum of its liabilities and shareholders' equity

$$\text{Assets} = \text{Liabilities} + \text{Shareholders' equity}$$

- This is the balance sheet identity, or equation, and it always holds because shareholders' equity is defined as the difference between assets and liabilities.



U.S. Corporation Balance Sheet



U.S. CORPORATION 2006 and 2007 Balance Sheets (\$ in millions)					
Assets			Liabilities and Owner's Equity		
	2006	2007		2006	2007
Current assets			Current liabilities		
Cash	\$ 104	\$ 160	Accounts payable	\$ 232	\$ 266
Accounts receivable	455	688	Notes payable	196	123
Inventory	553	555	Total	\$ 428	\$ 389
Total	<u>\$1,112</u>	<u>\$1,403</u>			
Fixed assets					
Net plant and equipment	<u>\$1,644</u>	<u>\$1,709</u>	Long-term debt	\$ 408	\$ 454
			Owners' equity		
			Common stock and paid-in surplus	600	640
			Retained earnings	1,320	1,629
			Total	<u>\$1,920</u>	<u>\$2,269</u>
Total assets	<u>\$2,756</u>	<u>\$3,112</u>	Total liabilities and owners' equity	<u>\$2,756</u>	<u>\$3,112</u>

Liquidity

Liquidity refers to the speed and ease with which an asset can be converted to cash. Gold is a relatively liquid asset; a custom manufacturing facility is not. Liquidity actually has two dimensions: ease of conversion versus loss of value.

Any asset can be converted to cash quickly if we cut the price enough. A highly liquid asset is therefore one that can be quickly sold without significant loss of value. An illiquid asset is one that cannot be quickly converted to cash without a substantial price reduction.



Liquidity (cont.)

Assets are normally listed on the balance sheet in order of decreasing liquidity, meaning that the most liquid assets are listed first.

Current assets are relatively liquid and include cash and those assets that we expect to convert to cash over the next 12 months. Accounts receivable, for example, represents amounts not yet collected from customers on sales already made. Naturally, we hope these will convert to cash in the near future.

Liquidity is valuable. The more liquid a business is, the less likely it is to experience Financial distress (that is, difficulty in paying debts or buying needed assets).



Debt versus Equity

To the extent that a firm borrows money, it usually gives first claim to the firm's cash flow to creditors.

Equity holders are only entitled to **the residual value**, the portion left after creditors are paid. The value of this residual portion is the shareholders' equity in the firm, which is just the value of the firm's assets less the value of the firm's liabilities:

$$\text{Shareholders' equity} = \text{Assets} - \text{Liabilities}$$

The use of debt in a firm's capital structure is called **financial leverage**. The more debt a firm has (as a percentage of assets), the greater is its degree of financial leverage. So, financial leverage increases the potential reward to shareholders, but it also increases the potential for financial distress and business failure.

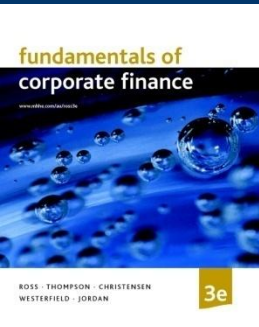


Market Value versus Book Value

- Generally Accepted Accounting Principles (GAAP) require audited financial statements to show assets at historical cost or book value.
- Market value is the price at which the assets, liabilities, or equity can actually be bought or sold.
- The shareholders' equity figure on the balance sheet and the true value of the stock need not be related. For financial managers, then, the accounting value of the stock is not an especially important concern; it is the market value that matters. Henceforth, whenever we speak of the value of an asset or the value of the firm, we will normally mean its market value.
- So, when we say the goal of the financial manager is to increase the value of the stock, we mean the market value of the stock.



Example—Market Value versus Book Value



KLINGON CORPORATION					
Balance Sheets					
Market Value versus Book Value					
	Book	Market		Book	Market
Assets			Liabilities and Shareholders' Equity		
Net working capital	\$ 400	\$ 600	Long-term debt	\$ 500	\$ 500
Net fixed assets	700	1,000	Shareholders' equity	600	1,100
	<u>\$1,100</u>	<u>\$1,600</u>		<u>\$1,100</u>	<u>\$1,600</u>

The Statement of Financial Performance (The Income Statement)



The income statement measures performance over some period of time, usually a quarter or a year. The income statement equation is:

$$\text{Revenues} - \text{Expenses} = \text{Profit}$$

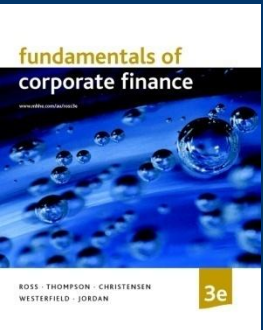
- The difference between net profit and cash dividends is called retained earnings, which is added to the retained earnings account on the balance sheet.

Example—Statement of Financial Performance



U.S. CORPORATION 2007 Income Statement (\$ in millions)		
Net sales		\$1,509
Cost of goods sold		750
Depreciation		<u>65</u>
Earnings before interest and taxes		\$ 694
Interest paid		<u>70</u>
Taxable income		\$ 624
Taxes		<u>212</u>
Net income		<u><u>\$ 412</u></u>
Dividends	\$103	
Addition to retained earnings	309	

Financial Ratios



A way of avoiding the problems involved in comparing companies of different sizes is to calculate and compare **financial ratios**

Such ratios are ways of comparing and investigating the relationships between different pieces of financial information. Using ratios eliminates the size problem because the size effectively divides out

Types of financial Ratios

1. Short-term solvency or liquidity ratios

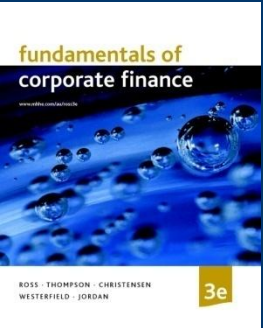
- 1.1. Current ratio
- 1.2. Quick (Acid test) ratio

2. Long-term solvency or financial leverage ratios

- 2.1. Total debt ratio
- 2.2. Debt-equity ratio
- 2.3. Equity multiplier

3. Asset management or turnover ratios

- 3.1. Inventory turnover
- 3.2. Days' sales in inventory
- 3.3. Receivables turnover



Types of financial Ratios (cont.)



4. Profitability ratios

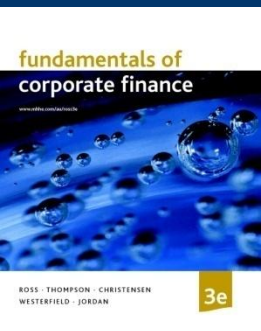
- 4.1. Profit margin
- 4.2. Return on assets (ROA)
- 4.3. Return on equity (ROE)

5. Market value ratios

- 5.1. Price-earnings ratio (P/E)
- 5.2. Market-to-book ratio (P/B)

1. Short-term solvency or liquidity ratios

- As the name suggests, short-term solvency ratios as a group are intended to provide information about a firm's liquidity, and these ratios are sometimes called *liquidity measures*.
- The primary concern is the firm's ability to pay its bills over the short run without undue stress. Consequently, these ratios focus on current assets and current liabilities.
- liquidity ratios are particularly interesting to short-term creditors. Because financial managers are constantly working with banks and other short term lenders, an understanding of these ratios is essential.



1.1. Current ratio

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

To a short-term creditor such as a supplier, the higher the current ratio, the better. To the firm, a high current ratio indicates liquidity, but it also may indicate an inefficient use of cash and other short-term assets.

Absent some extraordinary circumstances, we would expect to see a current ratio of at least 1, because a current ratio of less than 1 would mean that net working capital (current assets less current liabilities) is negative. This would be unusual in a healthy firm, at least for most types of businesses.

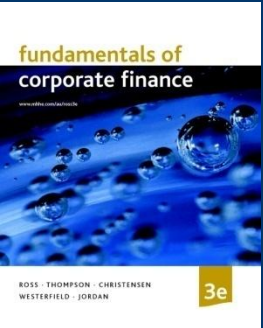


1.2. Quick (Acid test) ratio

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$$

To further evaluate liquidity, the quick or acid-test ratio is computed just like the current ratio, except inventory is omitted. Because Inventory is often the least liquid current asset

2. Long-term solvency ratios (financial leverage ratios)



Long-term solvency ratios are intended to address the firm's long-run ability to meet its obligations, or, more generally, its financial leverage.

These are sometimes called financial leverage ratios or just leverage ratios

2.1. Total debt ratio

The total debt ratio takes into account all debts of all maturities to all creditors. It can be defined in several ways, the easiest of which is:

$$\text{Total debt ratio} = \frac{\text{Total assets} - \text{Total equity}}{\text{Total assets}}$$



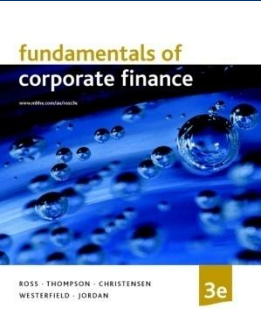
2.2. Debt-equity ratio

$$\text{Debt-equity ratio} = \text{Total debt} / \text{Total equity}$$

2.3. Debt-equity ratio

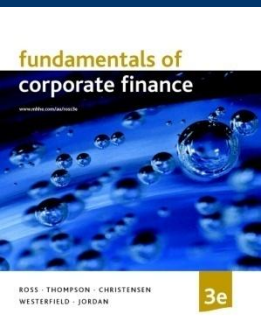
$$\text{Equity multiplier} = \text{Total assets} / \text{Total equity}$$

3. Asset management or turnover ratios



- The measures are sometimes called *asset utilization ratios*.
- *The specific ratios* we discuss can all be interpreted as measures of turnover. What they are intended to describe is how efficiently or intensively a firm uses its assets to generate sales.

3.1. Inventory turnover



$$\begin{aligned}\text{Inventory turnover} &= \frac{\text{Cost of goods sold}}{\text{Inventory}} \\ &= \frac{\$1,344}{\$422} = 3.2 \text{ times}\end{aligned}$$

In a sense, X corporation sold off or turned over the entire inventory 3.2 times.

As long as we are not running out of stock and thereby forgoing sales, the higher this ratio is, the more efficiently we are managing inventory.

3.2. Days' sales in inventory

$$\begin{aligned}\text{Days' sales in inventory} &= \frac{365 \text{ days}}{\text{Inventory turnover}} \\ &= \frac{365 \text{ days}}{3.2} = 114 \text{ days}\end{aligned}$$

- This tells us that inventory sits 114 days on average before it is sold.

Alternatively, assuming we have used the most recent inventory and cost figures, it will take about 114 days to work off our current inventory

4. Profitability ratios

These measures are intended to measure how efficiently the firm uses its assets and how efficiently the firm manages its operations. The focus in this group is on the bottom line, net income.

4.1. Profit Margin

$$\begin{aligned}\text{Profit margin} &= \frac{\text{Net income}}{\text{Sales}} \\ &= \frac{\$363}{\$2,311} = 15.7\%\end{aligned}$$

- This tells us that X corporation, in an accounting sense, generates a little less than 16 cents in profit for every dollar in sales.

4.2. Return on assets (ROA)

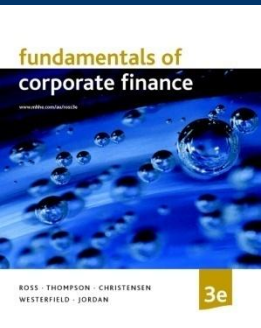
Return on assets (ROA) is a measure of profit per dollar of assets.

$$\text{Return on assets} = \frac{\text{Net income}}{\text{Total assets}}$$

4.3. Return on Equity (ROE)

Return on equity (ROE) is a measure of how the stockholders fared during the year. ROE is the true bottom-line measure of performance

$$\text{Return on equity} = \frac{\text{Net income}}{\text{Total equity}}$$



5. Market value ratios

Our final group of measures is based, in part, on information not necessarily contained in financial statements—the market price per share of the stock.

Obviously, these measures can only be calculated directly for publicly traded companies.

5.1. Price-earnings ratio (P/E)

5.2. Market-to-book ratio (P/B)



5.1. Price-earnings ratio (P/E)

$$\text{PE ratio} = \frac{\text{Price per share}}{\text{Earnings per share}}$$

- Because the PE ratio measures how much investors are willing to pay per dollar of current earnings, higher PEs are often taken to mean the firm has significant prospects for future growth.
- Of course, if a firm had no or almost no earnings, its PE would probably be quite large; so, as always, care is needed in interpreting this ratio.



5.2. Market-to-book ratio (P/B)

$$\text{Market-to-book ratio} = \frac{\text{Market value per share}}{\text{Book value per share}}$$

Because book value per share is an accounting number, it reflects historical costs.

In a loose sense, the market-to-book ratio therefore compares the market value of the firm's investments to their cost.

A value less than 1 could mean that the firm has not been successful overall in creating value for its stockholders

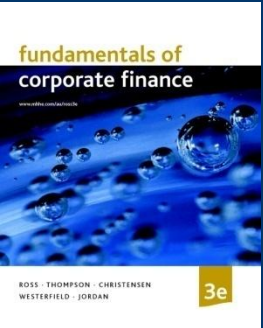
TABLE 3.8 Common Financial Ratios

I. Short-term solvency, or liquidity, ratios		II. Long-term solvency, or financial leverage, ratios	
Current ratio = $\frac{\text{Current assets}}{\text{Current liabilities}}$		Total debt ratio = $\frac{\text{Total assets} - \text{Total equity}}{\text{Total assets}}$	
Quick ratio = $\frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}}$		Debt-equity ratio = $\frac{\text{Total debt}}{\text{Total equity}}$	
Cash ratio = $\frac{\text{Cash}}{\text{Current liabilities}}$		Equity multiplier = $\frac{\text{Total assets}}{\text{Total equity}}$	
Net working capital to total assets = $\frac{\text{Net working capital}}{\text{Total assets}}$		Long-term debt ratio = $\frac{\text{Long-term debt}}{\text{Long-term debt} + \text{Total equity}}$	
Interval measure = $\frac{\text{Current assets}}{\text{Average daily operating costs}}$		Times interest earned ratio = $\frac{\text{EBIT}}{\text{Interest}}$	
		Cash coverage ratio = $\frac{\text{EBIT} + \text{Depreciation}}{\text{Interest}}$	
III. Asset utilization, or turnover, ratios		IV. Profitability ratios	
Inventory turnover = $\frac{\text{Cost of goods sold}}{\text{Inventory}}$		Profit margin = $\frac{\text{Net income}}{\text{Sales}}$	
Days' sales in inventory = $\frac{365 \text{ days}}{\text{Inventory turnover}}$		Return on assets (ROA) = $\frac{\text{Net income}}{\text{Total assets}}$	
Receivables turnover = $\frac{\text{Sales}}{\text{Accounts receivable}}$		Return on equity (ROE) = $\frac{\text{Net income}}{\text{Total equity}}$	
Days' sales in receivables = $\frac{365 \text{ days}}{\text{Receivable turnover}}$		ROE = $\frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}} \times \frac{\text{Assets}}{\text{Equity}}$	
NWC turnover = $\frac{\text{Sales}}{\text{NWC}}$		V. Market value ratios	
Fixed asset turnover = $\frac{\text{Sales}}{\text{Net fixed assets}}$		Price-earnings ratio = $\frac{\text{Price per share}}{\text{Earnings per share}}$	
Total asset turnover = $\frac{\text{Sales}}{\text{Total assets}}$		PEG ratio = $\frac{\text{Price-earnings ratio}}{\text{Earnings growth rate}}$	
		Price-sales ratio = $\frac{\text{Price per share}}{\text{Sales per share}}$	
		Market-to-book-ratio = $\frac{\text{Market value per share}}{\text{Book value per share}}$	
		Tobin's Q Ratio = $\frac{\text{Market value of assets}}{\text{Replacement cost of assets}}$	

Choosing a Benchmark

- Given that we want to evaluate a division or a firm based on its financial statements, a basic problem immediately comes up. How do we choose a benchmark, or a standard of comparison?
- Time-Trend Analysis
- Peer Group Analysis

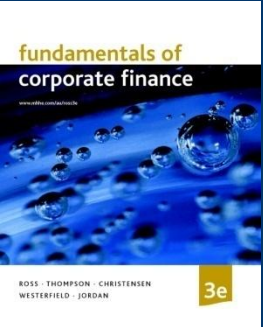
Time-Trend Analysis



One standard we could use is history. Suppose we found that the current ratio for a particular firm is 2.4 based on the most recent financial statement information.

Looking back over the last 10 years, we might find that this ratio had declined fairly steadily over that period.

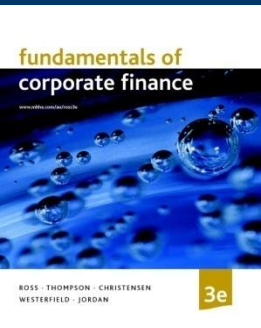
Peer Group Analysis



The second means of establishing a benchmark is to identify firms similar in the sense that they compete in the same markets, have similar assets, and operate in similar ways. In other words, we need to identify a *peer group*.

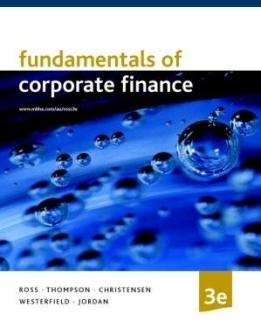
There are obvious problems with doing this since no two companies are identical. Ultimately, the choice of which companies to use as a basis for comparison is subjective.

Problems with Financial Statement Analysis



1. One particularly severe problem is that many firms are conglomerates, owning more or less unrelated lines of business.
2. different firms use different accounting procedures—for inventory, for example. This makes it difficult to compare statements

Problems with Financial Statement Analysis (cont.)



3. different firms end their fiscal years at different times. For firms in seasonal businesses, this can lead to difficulties in comparing balance sheets because of fluctuations in accounts during the year
4. for any particular firm, unusual or transient events, such as a one-time profit from an asset sale, may affect financial performance. In comparing firms, such events can give misleading signals.

Test Questions



1. Five areas that financial ratios concentrate on are:

1. liquidity, profitability, debt, efficiency, market related
2. profitability, strategy, liquidity, auditing, share prices
3. liquidity, current ratio, quick ratio, interest cover, dividend cover
4. market related, share prices, dividend policy, debt policy, strategy

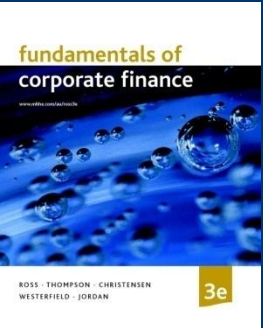
Test Questions



2. Ratios that measure the ability of the company to pay its short-term debts are called:

1. debt ratios
2. liquidity ratios
3. profitability ratios
4. none of the above.

Test Questions



3. The quick ratio is defined as:

1. current assets divided by current liabilities
2. current assets divided by total debt
3. current assets less inventory, divided by total liabilities
4. current assets less inventory, divided by current liabilities

Test Questions



4. Return on sales, return on assets and return on equity are examples of:

1. liquidity ratios
2. profitability ratios
3. efficiency ratios
4. market-related ratios

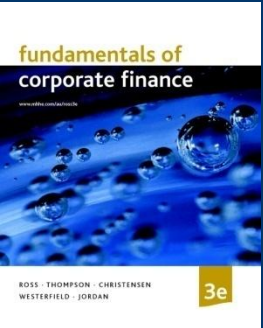
Test Questions



5. Net income divided by shareholders' equity is the definition of:

1. return on sales
2. return on assets
3. return on equity
4. none of the above.

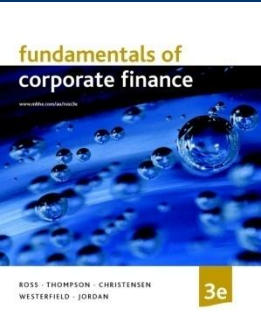
Test Questions



6. The debt to equity ratio measures;

1. the likelihood of the company going bankrupt in the short term
2. the efficiency of the company
3. the relative proportions of debt and equity in the capital structure
4. liquidity

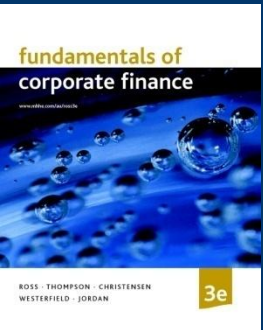
Test Questions



7. To measure the efficiency with which inventory is used the following ratio should be used:

1. inventory turnover ratio
2. inventory holding period
3. lower of cost or market valuation of inventory
4. a or b, but not c

Test Questions



8. Earnings per share is affected by:

1. net income
2. number of shares
3. dividends
4. a & b, but not c

Test Questions



9. Total asset turnover, receivables turnover and inventory turnover ratios measure:

1. liquidity
2. profitability
3. efficiency
4. debt

Test Questions



10 . The stock price multiplied by the number of shares outstanding is called:

1. market centralization
2. market capitalization
3. market stabilization
4. market compensation

True or False Questions

Are the following statements true or false?

1. Financial statements can assist you in monitoring your business' financial health.
2. Current assets are those assets which form part of the infrastructure of the business.
3. Current liabilities are those amounts owed which need to be paid within a short period of time (i.e. usually within 12 months).



True or False Questions

4. Is the following statement true or false?

Ratio analysis helpful to assessing profitability, liquidity and financial stability.

5. Is the following statement true or false?

Financial statements generally show trends, relationships, strengths and weaknesses in key areas of your business.



Concept Questions

1. What is the balance sheet identity?
2. What is liquidity?
3. Explain the difference between accounting value and market value. Which is more important to the financial manager?
4. What are the five groups of ratios? Give two or three examples of each kind
5. Distinguish between fixed assets and current assets.