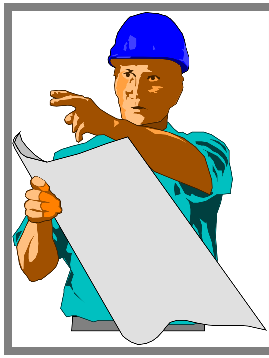
Department of Mechanical Engineering,
Pulchowk campus, Institute of Engineering,
Tribhuvan University

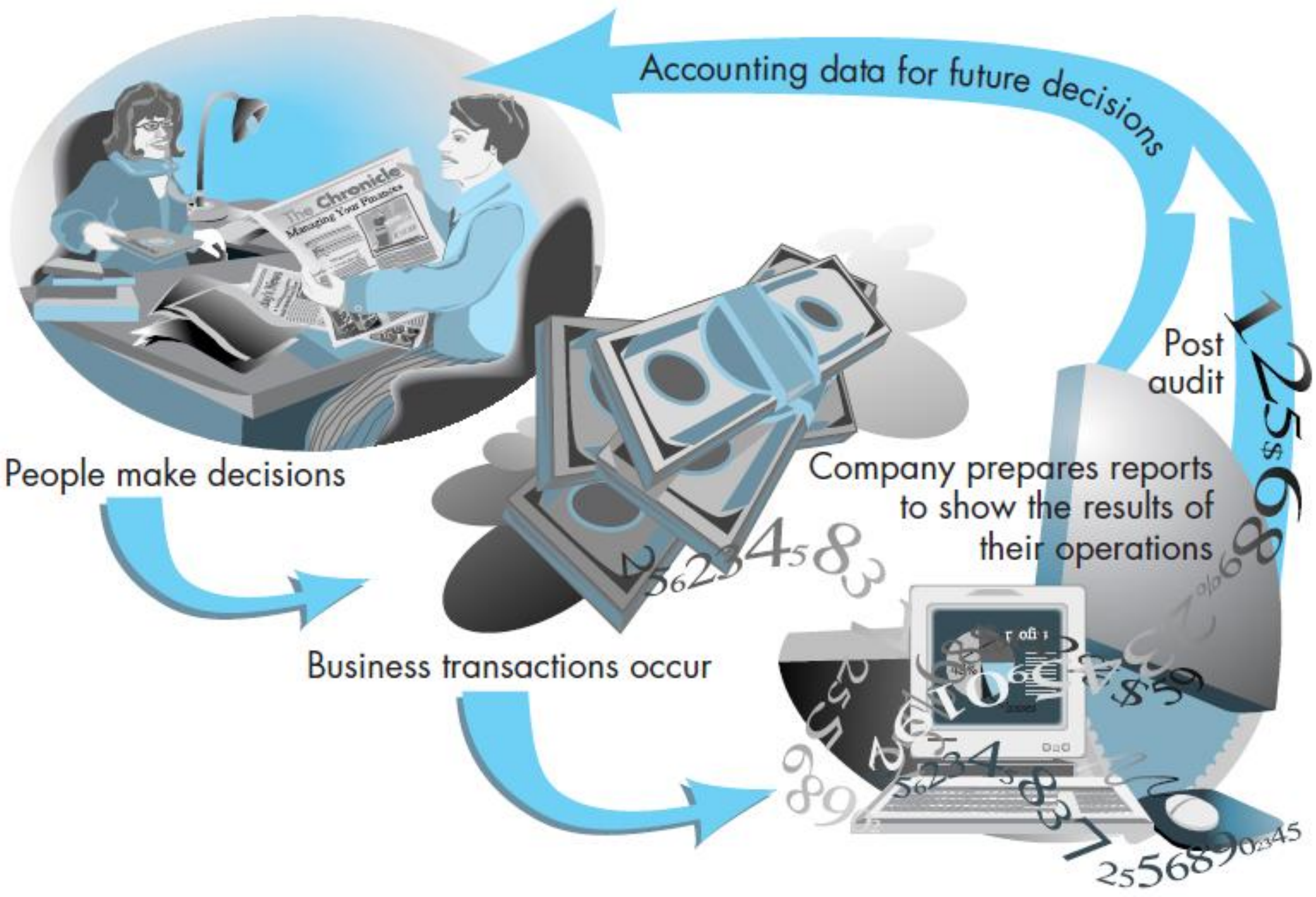
ENGINEERING ECONOMICS

Financial Statement and Ratio Analysis

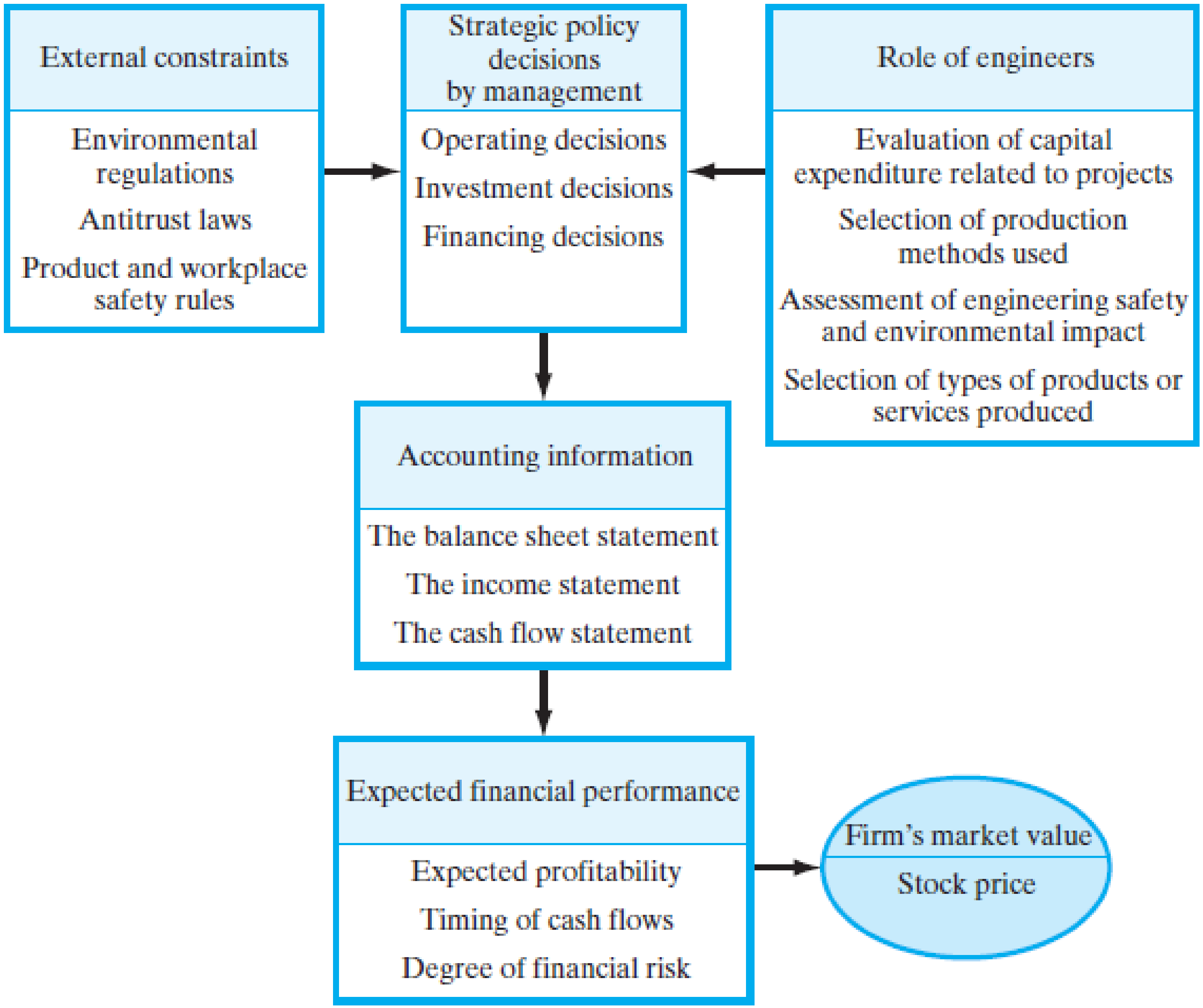


Dr. Shree Raj Shakya
2018

The accounting system and flow of information



Summary of major factors affecting stock prices



Financial Statements

- These are statements of financial information to the managers and the shareholders.
  - Income Statement (Profit and Loss Statement)
  - Balance Sheet
  - Cash Flow Statement

Financial Status for Business

Beginning of fiscal period

How much **profit** did the company make during the fiscal period? → **Income Statement**

How much **cash** did the company generate and spend during the period? → **Cash Flow Statement**

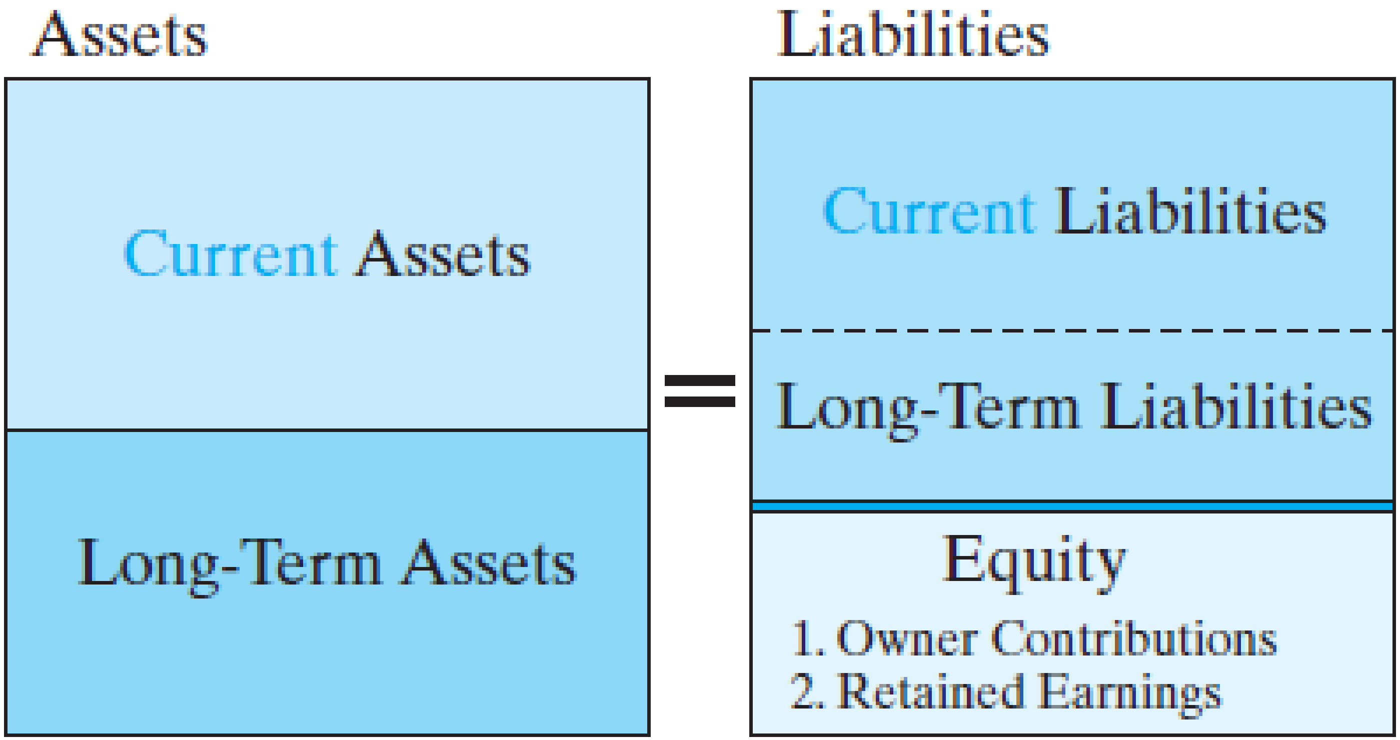
What is the company's **financial position** at the end of fiscal period? → **Balance Sheet**

End of fiscal period

Balance Sheet

- It gives **snapshot summary** of the firm's **financial position** at a **single point in time**.
- The balance sheet **shows the net worth of shareholders at a point in time**, whereas income statement measures changes in net worth.
- **Liabilities** indicate what money has been made available to the firm.
- **Assets** show how the firm has used the money made available to it.

Balance Sheet



Balance Sheet

- **Current Liabilities** are the short -term debt obligations of a firm, with maturities of less than one year.
- **Fixed liabilities** are firm's long-term finance such as long-term debts from banks and the public.
- **Shareholders' equity** is the money invested by the shareholders and the retained earnings.

Balance Sheet

- **Fixed Assets** are acquired for long-term uses in the firm such as plant, building, land, and equipment.
- **Current Assets** are cash, accounts receivables, and inventories of finished goods and raw materials.

Balance Sheet

- **Depreciation** is the allocation of cost of an asset to different time periods.
- **Working Capital** is composed of firm's current assets.
- **Net Working Capital** is the difference between current assets and current liabilities.

Balance Sheet

Fixed Assets

- Land
- Buildings
- Plant and Machinery
- Fixtures and fittings
- Motor vehicles

Balance Sheet

CURRENT ASSETS

- Cash in hand
- Cash in bank
- Marketable securities
- Accounts receivables
- Prepaid expenses
- Deposits

- Finished Products
- Work in progress
- Raw materials
- Other supplies

Balance Sheet

The Workhard Brothers Limited
Balance Sheet
As at Dec. 31, 19X5

ASSETS		LIABILITIES	
Current –		Current –	
Cash	$ 180	Bank Overdraft	$ 500
Accounts Receivable	6,560	Income Taxes Payable	2,500
Inventory	13,150	Accounts Payable	6,600
Total Current	$19,890	Current Portion –	
		Long Term	1,100
		Total Current	$10,700

ASSETS = LIABILITIES + OWNERS' EQUITY

Vehicles	11,500	Less: Current Portion	1,100
	$67,800	Total Long Term	$30,000
Less: Accum. Deprec.	8,100	Total Liabilities	$40,700
Total Fixed	$59,700		
		SHAREHOLDERS' EQUITY	
		Share Capital –	$10,000
		Retained Earnings	28,890
		Total Shareholders' Equity	$38,890
TOTAL ASSETS	$79,590	TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	$79,590

Balance Sheet

Balance Sheet Statement – Dell Computer Corporation				
(in millions)	28-Jan-00	29-Jan-99	Change	Percent
ASSETS				
Current assets:				
Cash	$ 3,809	$ 1,726	$ 2,803	121%
Short-term investments	323	923	(600)	-65%
Account receivables, net	2,608	2,094	514	25%
Inventories	391	273	118	43%
Other	550	791	(241)	-30%
Total current assets	7,681	5,807	1,874	32%
Property, plant and equipment, net	765	523	242	46%
Long-term investments	1,048	532	516	97%
Equity securities and other investments	1,673	-	1,673	
Goodwill and others	304	15	289	1927%
Total assets	**$ 11,471**	**$ 6,877**	**$ 4,594**	**67%**

Balance Sheet

Balance Sheet Statement – Dell Computer Corporation

(in millions)	28-Jan-00	29-Jan-99	Change	Percent
LIABILITIES AND STOCKHOLDERS'EQUITY				
Current liabilities:				
Accounts payable	$ 3,538	$ 2,397	$ 1,141	48%
Accrued and other	1,654	1,298	356	27%
Total current liabilities	5,192	3,695	1,497	41%
Long-term debt	508	512	(4)	-1%
Other	463	349	114	33%
Total liabilities	6,163	4,556	1,607	35%
Stockholders' equity:				
Preferred stock	-			
Common stock and capital in excess of $0.01 par value	3,583	1,781	1,802	101%
Retained earnings	1,260	606	654	108%
Other	465	(66)	531	
Total stockholders' equity	5,308	2,321	2,987	129%
Total liabilities and stockholders' equity	**$ 11,471**	**$ 6,877**	**$ 4,594**	**67%**

Income Statement

- It shows the **record of financial events** between **two points in time**. It has revenue from sales and expenses incurred during the period.
- Net Worth

  The value of total assets minus total liabilities or the value of the owners' claim on the assets.

Income Statements (P/L statement)

- **Expenditures** are all cash outflows
  - Expenses are only those expenditures that affect net worth of the shareholders and appear in the Income Statement.
- **Receipts** are all cash inflows.
  - Revenues are only those receipts that affect net worth and thus appear in the income statement.

Income Statement

Revenue

Costs of Goods Sold (COGS)

Gross Profit

Expenses

Net Income

Income Statement

The Workhard Brothers Limited
Operating Statement
For the 12 months
ended December 31, 19X5

				%
SALES (REVENUE)			$185,000	100.0
COST OF GOODS SOLD				
Opening Inventory		$ 12,000		
Purchases		111,150		
		$123,150		
Closing Inventory		13,150		
TOTAL COST OF GOODS SOLD			110,000	59.5
GROSS PROFIT			$ 75,000	40.5
OPERATING EXPENSES				
Wages & Benefits		$ 30,000		16.2
Advertising		1,500		0.8
Automobile		2,400		1.3
Bad Debts		300		0.2
Equipment Rental		400		0.2
Insurance		1,200		0.7
Interest and Bank Charges		4,000		2.2
Management Salaries		16,000		8.6
Office Supplies		1,100		0.6
Professional Fees		800		0.4
Taxes and Licenses		300		0.2
Telephone		800		0.4
Utilities		2,100		1.1
Depreciation		3,700		2.0
Miscellaneous		400		0.2
TOTAL OPERATING EXPENSES			65,000	35.1
OPERATING PROFIT			$ 10,000	5.5
Less: Taxes	(A)		2,500	1.4
NET PROFIT			$ 7,500	4.1

Income Statement – Dell Computer Corporation

(in millions, except per share amount)	28-Jan-00	29-Jan-99
Net Revenue	$25,265	$18,243
Cost of revenue	20,047	14,137
Gross margin	5,218	4,106
Operating expenses:		
Selling, general and administrative	2,387	1,788
Research, development and engineering	568	272
Total operating expenses	2,955	2,060
Operating income	2,263	2,046
Other income	188	38
Income before income taxes	2,451	2,084
Provision for income taxes	785	624
Net income	**$1,666**	**$1,460**
Earnings per common share:		
Basic	$0.66	$0.58
Diluted	$0.61	$0.53
Weighted average shares outstanding:		
Basic	2,536	2,531
Diluted	2,728	2,772
Retained Earnings:		
Balances at beginning of period	606	607
Net income	1,666	1,460
Repurchase of common stocks	(1,012)	(1,461
Balances at end of period	**$1,260**	**$606**

Cash Flow Statement

- **Source- and -use-of-funds Statement** (cash flow statement) is a **summary of the flow of the financial activity** of the firm. It shows where the firm **obtains cash and how it uses it**.
- **Sources of funds**
  - Increase in liabilities
  - Increase net worth through retained earnings or capital contribution by the shareholders
  - Reduction in assets through sales of assets
- **Uses of funds**
  - reduction in liabilities
  - reduction in net worth through payment of dividends or losses
  - increase in assets

Cash Flow Statement

- Cash flow from **operating activities**
  - – Net profit
  - – Depreciation
  - – Decrease in account receivables
  - – Increase in accounts payables
- Cash flow from **investing activities**
  - – Sales of fixed assets
  - – Investment in new fixed assets

Cash Flow Statement

- Cash flow from **financial activities**
  - – Increase in debt (cash inflow)
  - – Issuance of new shares (cash inflow)
  - – Dividend payment (cash outflow)

Cash Flow Statement – Dell Computer Corporation

(in millions)	28-Jan-00	29-jan-99
Net income	$1,666	$1,460
Depreciation and amortization	156	103
Changes in working capital	2,104	873
Net cash provided by operating activities	3,926	2,436
Cash flows from investing activities:		
Marketable securities:		
Purchase	(3,101)	(1,938)
Sales	2,319	1,304
Capital expenditures	397	(296)
Net cash used in investing activities	(1,183)	(930)
Cash flows from financing activities:		
Purchase of common stock	(1,061)	(1,518)
Issuance of common stock under employee plans	289	212
Proceeds from issuance of long-term debt	20	494
Cash received from sale of equity options and other	63	
Repayment of borrowings	(6)	
Net cash used in financing activities	(695)	(812)
Effect of exchange rate changes on cash	35	(10)
Net increase in cash	**$2,083**	**$684**
Cash at beginning of period	1,726	1,042
Cash at end of period	**$3,809**	**$1,726**

Ratio Analysis

- In ratio analysis, we **relate various items** from the firm's **financial statements** to **each other** with the **aim of assessing and analyzing** the **firm's financial position.**
- By comparing the financial ratios of the same company over different periods, or by comparing with that of other companies in the industry, or the industry average, we can compare the relative performance of the company.
- Common comparisons are:
  1. Same company over several years.
  2. An industry leader or "best practice."
  3. Industry norms found in publications.
  4. A self-developed set of comparable companies.
  5. International variations on 2, 3, and 4.
  6. Rules of "thumb."

Types of ratios used in evaluating a firm's financial health

Financial Ratios

Debt Management

Ratios that show how a firm uses debt financing and its ability to meet debt repayment obligations.

- **Debt ratio**
- **Times-interest-earned ratio**

Market Trend

A set of ratios that relate the firm's stock price to its earnings and book value per share.

- **P/E ratio**
- **Market/book ratio**

Liquidity

Ratios that show the relationship of a firm's cash and other assets to its current liabilities.

- **Current ratio**
- **Quick ratio**

Asset Management

A set of ratios which measure how effectively a firm is managing its assets.

- **Inventory turnover ratio**
- **Day's sales outstanding ratio**
- **Total assets turnover ratio**

Profitability

A set of ratios which show the combined effects of liquidity, asset management, and debt on operating results.

- **Profit margin on sales**
- **Return on total assets**
- **Return on common equity**

Profitability Ratios

Profitability ratios **assess the profitability** of the firm.

Profit Margin = Net income / Revenue

Return on assets = Net income / Total Assets

Return on equity (Return on Investment) = Net income / Owners' Equity

Normally profitability ratios **higher** than comparables are **good** news.

Asset management/ Activity Ratios

These ratios help in **evaluating** the **managerial efficiency** of the firm.

Asset Turnover = Revenue / Total Assets

Days' receivables = Accounts receivables / Average Days Sales

Average days sales = Revenue / 365

Any **turnover ratio**: Normally **higher** than the comparable ratios are **good** news, although for plant and equipment one may worry if necessary repairs and maintenance are being carried out if substantially higher turnover than industry.

Number of days sales in a current asset: Normally **higher** than comparables is **bad** news as your conversion of the asset into cash is slower than the reference industry.

For inventory: **higher** ratios may indicate **old, slow moving inventory**; for **accounts receivable**: a **higher** ratio may indicate **problems collecting A/R**.

Debt management / Leverage Ratios

Leverage ratios measure the **degree to which a firm relies on bank debts** and other debt securities

Debt ratio = Total Liabilities / Total Assets

Debt to equity ratio = Total Liabilities / Owners' Equity

Times interest earned = (Income before taxes + Interest Expense - Equity in earnings of affiliates) / Interest Expense
(Equity in earnings of affiliates are earnings NOT available to pay interest with so many analysts remove it before calculating times interest earned)

Days payables = Accounts payable / Average operating expenses
Average operating expenses = Operating expenses / 365

The amount of debt relative to equity is a major management decision that is discussed in great detail in finance courses. The **higher any debt ratio** is the **greater the company's risk** as fixed interest expenses are increasing. Thus, **higher** debt ratios than comparables may indicate **more risk** than comparables. However, **if the company is well managed**, this risk may be **offset** with **higher returns** to shareholders.
Times interest earned ratios that are **higher** than comparables indicate **greater ease in paying interest**, therefore, **less risk**.

Liquidity ratios

These ratios reflect a firm's **short-term ability to pay its debts**.

Current ratio = Current assets / Current liabilities

Quick ratio = (Cash + Accounts receivable) / Current liabilities

Higher liquidity ratios than comparables are subject to **two interpretations** dependent on context.
Higher liquidity may indicate **better ability to pay short term debts** as they come due
or alternatively may indicate **inadequate controls over credit granting** (for A/R) or inventory buildup.

Market trend/ ratios

These ratios reflect the data from the financial statements to financial market data.
These ratios **provide some insights** into **investors' perception** of the **firm** and **its securities**.

Price/earnings ratio = Year end market price per share / Fully diluted earnings per share

Dividend yield = Dividend per share / Year end price per share

It is a very controversial ratio not easily subject to interpretation.

Research shown that of all ratios, P/E is most context specific in its interpretation. For example, a **high P/E** has been cited as being an indication of a **highly risky stock**, a stock with **high growth potential**, and a stock with an unusually bad current year that is not "normal."

Exercise

2.3, 2.5, 2.6, 2.7

THANK YOU