ENGINEERING ECONOMY

SME4833

PART II: ACCOUNTING
Chapter 3
FINANCIAL STATEMENTS AND ANALYSIS

Lecturer

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FINANCIAL STATEMENTS AND ANALYSIS

3.1 Introduction to Financial Accounting

3.2 The Financial Statements

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3.4 Balance Sheet statement

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3.6 Chapter Summary

Materials in these slides are extracted from a published text. Readers who are interested to get detail explanation can refer to the following text:

Muhamad Zameri Mat Saman, Wan Harun Wan Harun Wan Hamid, Masine Md Tap, Rozlina Md Sirat*. Engineering Economy and Accounting for Engineers, Pearson Malaysia Sdn. Bhd., Malaysia, 2012.*

Learning outcome

1. Identify method to identify gross profit, net profit before tax, net profit after tax and retained earnings.
2. Identify method to develop balance sheet for balance.
3. Determine a company's status through financial analysis.
4. Calculate ratios from the accounting data.

3.1 Introduction to Financial Accounting

- Recording and analysis method for monetary transaction.
- Report results for decision making.

Form and classification of business organisation.

- Business organisation
  - Individual ownership (Sole proprietor)
- Partnership
  - Owned by 2 or more individuals (partners).
- Private Limited (Sendirian Berhad)
  - Owned by a group of shareholders.

3.2 Financial Statement

Business transaction is recorded with the purpose of:

1. To determine the value of assets and liabilities.
2. Identify profit and loss for each accounting period.

2 user groups of this information:

1. External – share holders, financial institute, government, creditors, clients and potential investors.
2. Internal – company's staff.

Terms in Financial Statement

Starting stock – inventories from previous accounting period and is brought forward to the current accounting period.

End stock - inventories that could not be used or sold in the current accounting period and will be brought forward to the next accounting period. (to become starting stock for the next accounting period).

Cost of sale – only consider cost of goods that was sold in the current period.

Gross profit – net sales minus cost of sale in the accounting period.

Net profit - gross profit minus all administrative and sale overhead costs in the accounting period.

Terms in Financial Statement

Asset classification :

Fixed asset – assets acquired to operate the company and has a long life (longer than 1 year) for example: machine, building and equipment.

Current asset – assets which can change its form from time to time (For example: from cash to stock) or can change to cash quickly also known as liquid asset. (For example : accounts receivable, bank balance)

Non tangible assets – Assets which are non physical (Example: Value of patent, copyright, trademarks and goodwill)

Terms in Financial Statement

Liability classification:

Long term liabilities – company's debt that it does not have to pay back in 12 months. Example: Long term bank loans.

Current liability – debts / liabilities that need to be paid within 12 months from the date of the balance sheet. Example : Bank overdraft, creditors.

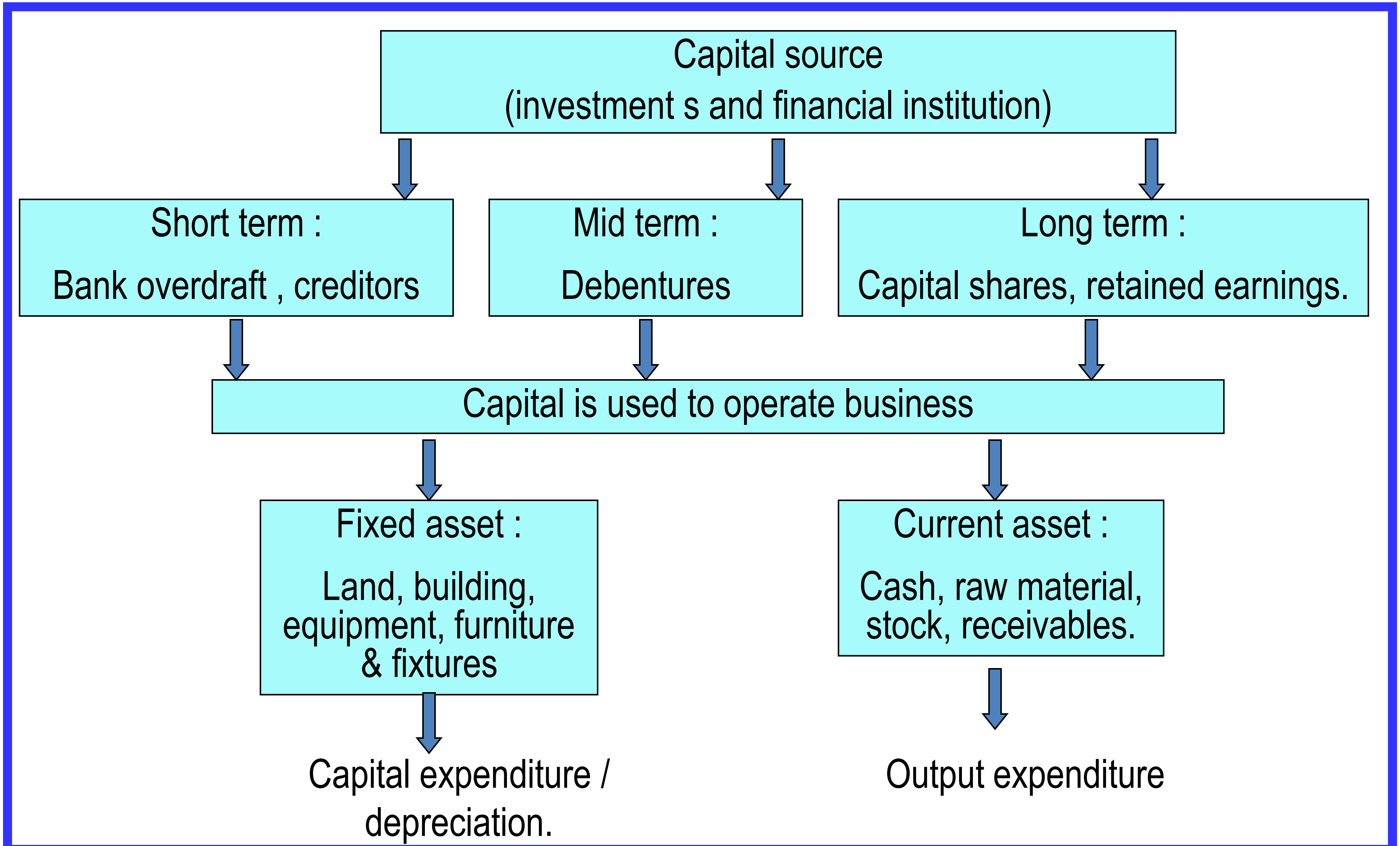
Ownership equity – consists of capital and net profit (retained earnings).

Owner's'draw –withdrawal from owner capital, only occur in sole proprietor or partnership.

Financial structure of a business organisation

- Source of capital
  - Investment (shares)
  - Financial institution
  - Retained earnings
- Capital utilization
  - The expenditure of capital to acquire fixed assets (Example: building) and current assets (Example: stock, cash, debtors)
- Purpose of profit
  - Pay taxes.
  - Pay dividend.
  - Retain earnings – entered into ownership.

Financial Structure of a Business Organisation



Important formulae

- Long term loan = debts that has to be paid in within a period of more than 12 months.

  (Usually long term loan is used to buy fixed assets)

- Normal share – a permanent investment in a business organisation.

- Companies need to balance the ratio of distribution.
  - Distribution ratio = ratio between total sponsor /support through normal shares and total loan/debt

- $\sum$ assets = fixed asset + current asset

Methods to increase funds

- Issue new shares.
- Offer convertible loans (from loans to equity).
- Make mortgage loans and non-mortgage loan.
- Sell fixed asset.
- Increase total lenders.
- Decrease total borrowings.
- Reduce inventory.

3.3 Profit and Loss statement (Income statement)

Income statement

Accounting relationship:

Gross profit (loss) = Net sales – Cost of sales

Net profit = (Gross profit + other revenues) – Administrative cost & overhead

Explains :

Net income from operation (sales).

Costs involved to secure / get sales.

Profit before and after tax.

Concluding the income and expenditure for a specific period.

Structure of Income Statement

To determine the gross and net profit.

- Gross profit = net sales – cost of sales
- *Where : cost of sales = starting stock + purchase – end stock*
- Net profit = (Gross profit + revenues from other sources) – Administrative and sales expenditure (overhead)
- Net profit (before tax) – tax = Net profit after tax.
- Net profit after tax – dividend = retained profit.
- Two formats – I format & T format

Income statement (I Format)

Income statement for year ending 31 December 2006

Sales			180,000
Minus:	**COST OF SALES**		
	Beginning stock	2,000	
	Purchase	30,000	
	Cost of goods sold	32,000	
	Minus ending stock r	10,000	
	Cost of sale		22,000
GROSS PROFIT			158,000
Add :	**REVENUE**		
	Rent receive	8,000	
	Commision received	15,000	
			23,000
Minus:	**ADMINISTRATIVE & SALES EXPENDITURE:**		
	Insurance	20,000	
	Wages	50,000	
	Utilities (electricity, water)	25,000	
			95,000
NET PROFIT			**86,000**

Income statement (T format)

Beginning stock	2,000	Sales	180,000
Purchase	30,000		
Cost of goods sold l	32,000		
Minus ending stock	(10,000)		
Cost of sales	22,000		
Gross profit	158,000		158,000

Wages	50,000	Gross profit	158,000
Utilities	25,000	Rent received	8,000
Insurance	20,000	Commision received	15,000
	95,000		181,000
Net Profit	86,000		86,000

Case Involving Depreciation

1. Shown as expenditure in Profit/Loss Account and as a reduction to the asset value in Balance sheet .
2. Profit and loss statement for year ending 31st December 2006 (Example)

Wages	50,000	Gross profit	158,000
Depreciation	1,000		
Utilities	25,000	Rent received	8,000
Insurance	20,000	Commission received	15,000
	96,000		181,000
Net Profit	85,000		85,000

3. In Balance sheet (Example)

Fixed Asset				
Furniture Minus: Depreciation	**10 000.** **(2 000)**	**8 000**		

Calculating profit after taxes

- Statement shows :
  - Net income from operations (sales turnover)
  - Cost involved in producing sales
  - Profit before taxation
  - Net profit after taxes
  - Dividend
  - Retained earnings that is turned into capital.

Net profit after tax = Net profit before tax – tax.

Example: Calculation for Net Profit After Tax from Income Statement:

Income statement year ending 31st December 2006

SALES			180,000
Minus:	COST OF SALES Beginning stock Purchase ***Cost of goods sold*** Minus ending stock ***Cost of sales***	 2,000 30,000 32,000 10,000	 22,000
GROSS PROFIT			158,000
Add :	REVENUE Rent received Comission received	 8,000 15,000	 23,000
Minus:	EXPENDITURE Insurance Wages Utilities (electricity, water)	 20,000 50,000 25,000	 95,000
NET PROFIT			86,000
Minus:	**Tax (25% of net profit)**		21,500
	Net profit after tax		64,500

Example: Determine Net Profit After Tax

Income statement at year ending 31 December 2006

Wages	50,000	Gross profit	158,00 0
Electricity and water	25,000	Rent received	8,000
Insurance	20,000	Commision received	15,000
Vehicle depreciation	1,000		
	96,000		
Net profit (before tax)	85,000	**Net profit (Before taxes)**	85,000
Tax (20% of net profit)	17,000		**17,000**
Net profit after taxes	**68,000**		**68,000**

Determining Retained Earnings

Retained earnings = net profit after tax – dividend that has to be paid to shareholders.

dividend= % of net profit after tax

Determining retained earnings – Income statement (year ending 31st December 2006)

SALES			180,000
Minus:	COST OF SALES Beginning stock Purchase ***Cost of goods sold*** Minus ending stock ***Cost of sales***	 2,000 30,000 32,000 10,000	22,000
GROSS PROFIT			158,000
Add:	REVENUE Rent received Commission received	 8,000 15,000	23,000
Minus:	EXPENDITURE Insurance Wages Utilities (electricity, water)	 20,000 50,000 25,000	95,000
NET PROFIT			86,000
Minus:	Taxes (25% of net profit)		21,500
	Net profit after taxes		**64,500**
Minus:	**Dividend (60% of net profit after taxes)**		**38,700**
	Retained earnings		**25,800**

Determine retained earning in Profit & Loss Account

(year ending 31st December 2006)

Wages	50,000	Gross profit	158,000
Water & electricity	25,000	Rent received	8,000
Insurances	20,000	Commission received	15,000
Vehicle transportation	1,000		
	96,000		
Net profit (before taxes)	85,000	Net profit (before taxes)	85,000
Taxes (20% of net profit)	17,000		17,000
Net profit after taxes	**68,000**		**68,000**
Dividend (40% of net profit after taxes)	**27,200**	**Dividend (40% of net profit after taxes)**	**27,200**
Retained earnings	**40,800**	**Retained earnings**	**40,800**

3.4 Balance Sheet

- A statement record of assets, liabilities and capital (ownership) at a specific time/date.
- Shows the financial status of a business organization.

Accounting formula :

Asset = Liability + Ownership Equity (ownership capital)

Asset = monetary value of an assets owned by the company. It is sponsored by source of capital (internal or external). Classification of assets:

Fixed asset *(Aset tetap)* – assets acquired for the operation of the company and has a long term life (For example, machines, buildings, equipments)

Current asset *(Aset semasa)*– assets that can be convert its form from time to time(For example from cash to stock, to accounts receivable, bank balance and others) It can be converted to cash quickly(liquid asset)

Intangible assets (*Aset tak ketara*) – asset that has no physical form. (For example, copyright, brand names, patents, goodwill and others.)

Balance Sheet

Accounting formula :

Asset = Liability + Ownership Equity (ownership capital)

Liability= monetary value of debt or liabilities of a company.

Long term liability – company's debts that does not have to be paid within 12 months. Example: creditors or bank loans.

Current liability – debts/ liabilities that has to be paid within 12 months from the date of the balance sheet. Example: bank overdraft, creditors.

Accounting formula :

Asset = Liability + Ownership Equity (ownership capital)

Ownership equity = actual value of the capital owned(also called net value, shareholders' fund)

Capital owned by ownership is acquired from :

- Investment (shares issued)
- Reserves
- Retained earnings
- Owner's draw (for sole proprietor / partnership only)

Balance Sheet (T form)

31st December 2006

Fixed asset			**Ownership equity**	
Furnitures and fixtures	XX		Capital	XX
Minus depreciation	XX		Net profit	**XX**
		YY		YY
Buildings		XX	(Owner's draw)	**(XX)**
Vehicle	XX			YY
Minus depreciation	XX			
		YY		
Current asset			**Long term liability**	
Ending stock		XX	Debenture	
Cash		XX	**Short term liability**	XX
Accounts receivables *(Penghutang)*		XX	Creditors (*Pemiutang*)	
Bank		XX	Overdraft	XX
				XX
		YY		YY

Example : Balance sheet (T form)

Balance sheet on ________________

Fixed asset			Equity		
....	20		....	40	
....	30	50	....	10	50
Current asset			Long debt/liability		
....	30		....	10	
....	20	50	....	20	30
		100			
			Current liability		
			....	10	
			....	10	20
					100

Balance sheet (I format)

Balance sheet at ________________

Fixed asset	RM		RM	RM	
…………		20			
…………		30			50
Current asset					
…………		30			
…………		20	50		
Minus current liability					
…………		10			
…………		10	(20)		
Net current asset (working capital)					30
Total asset minus current liability (net capital used)				80	
Minus loan				(30)	
Net value of company					50
Net value of company funded by :					
……….	40				
……..	10				50
					100

Example 1

Financial record for Berlian Utama Ptd Ltd. ending 31st December. Depreciation per year is 5% of fixed asset.

a) 28% tax in charged on net profit.
b) Dividend - 7.5% of net profit after taxes. .

Determine the gross profit and retained earnings. Include this in the Balance sheet.

Item	**RM**
Stock on 1st Jan 2005	10 000
Stock on 31st Dec 2005	8 000
Capital	80 000
Bank	127 000
Purchase	30 000
Owner's draw	2 000
Cash	3 500
Accounts receivable	9 000
Creditors	15 000
Overdraft	2 092
Sales	200 000
Administartion & sales expenditure.	27 500
Furniture and fixtures.	50 000
Depreciation allocation for furniture and fixture	5 000
Debenture	8,000

Solution

Procedure:

Step 1: Categorize accounts according to types.

Step 2: Build income statement (in this case) **or** Commerce and Profit/loss accounts.

Step 3: Determine the gross profit and net profit.

Step 4: Build the Balance Sheet.

Income Statement for year ending 31st December 2006.

Sales			200 000
Minus: Cost of sales	Beginning stock Purchase Cost of good sold Minus: Ending stock Cost of sales	10 000 30 000 40 000 (8 000)	 32 000
Gross profit			168 000
Minus: Expenditure	Administration and sales expenditure Depreciation (5%)	27 500 2 500	30 000
Net profit Minus: Taxes (28%)			138 000 (38 640)
Net profit after taxes. Minus: Dividend (7.5%)			99 360 (7 452)
Retained earning			91 908

Balance Sheet at 31st December 2006

Fixed assets Furniture & fixtures 50 000 Minus: Allocation for depreciation (7 500) *(5 000+ 2500)*	 42 500	**Ownership equity** Capital Retained earnings Minus: Owner's draws	 80 000 91 908 171908 (2 000) 169 908
Current assets Ending stock Cash Accounts receivable Bank	 8 000 3 500 9 000 127 000	**Long term liabilities** Debenture **Short term liabilities** Creditors Overdraft	 8 000 10 000 2 092
	190 000		190 000

3.5 Analysis of Financial Ratios

- Use data from financial report (Profit/Loss statement and Balance Sheet)
- Relationship between data in Profit/Loss statement and Balance Sheet for evaluation of company's performance.
- Uses :
  - Evaluate trend.
  - Performance comparison between companies.
  - Link interdependent factors to evaluate performance.
  - Planning, forecasting and control.

Parties interested in ratio analysis.

- **Investors**
  - Interested in ratios that measures profitability such as return in investments and dividend.
- **Financial institutions, debenture holders and creditors**
  - Interested in ratios that measures ability to pay current and long term liabilities
- **Business creditors**
  - Interested in ratios that measures ability to pay current and long term liabilities
- **Management and staff of company**
  - Interested in the overall performance of company for planning, control and incentive schemes.

Types of accounting ratio analysis

Analysis on the level of liquidity of company

- Related to current assets, current liabilities, inventory turnover accounts receivable turnover *(pusing ganti inventori, penghutang & pemiutang.)*

- Analysis on financial performance
  - Related to sales and assets and the returns on the capital that was utilized.

- Analysis on business performance
  - Related to business performance from the investors perspectives.
  - Related to return on share value and dividend and other investments factors.

How ratios are compared

- Ratio values is meaningless if it is not compared with another value.

Comparison may be done through :

1. Periodic cycles (Example : every years for several years)

2. Between other companies in similar industries.

3. Comparison with a standard (Example: average ratio that represents an industry)

3.6 Accounting ratio

The interpretations for accounting ratios may be classified as:

i) Liquidity ratios (*Nisbah kecairan*)

ii) Activity ratios (*Nisbah aktiviti*)

iii) Capital ratios (*Nisbah modal/keumpilan*)

iv) Profit ratios (*Nisbah keberuntungan/keunt*ungan)

v) Return in investment ratios (*Nisbah pasaran saham/pulangan pelaburan)*

Ratio and its relationships

Liquidity Ratios *(Nisbah kecairan)*

Current ratio = <u>current asset</u>
current libilities

Nisbah semasa = <u>*Aset semasa*</u>
Liabiliti semasa

Quick ratio (acid test ratio)
= <u>Current asset – End stock</u>
Current liabilities - overdraft

Nisbah cepat (ujian asid)
= <u>*Aset semasa – stok akhir*</u>
Liabiliti semasa-overderaf

Evaluate company's ability to pay current liabilities.

Activity Ratio (*Nisbah aktiviti*)

Inventory turnover
= $\frac{\text{Sales cost}}{\text{Average stock}}$

Stock period
= $\frac{\text{No. of days a year}}{\text{Inventory turnover}}$

Nisbah pusing ganti inventori (NPI)

= $\frac{\textit{Kos jualan}}{\textit{stok (purata)}}$

Tempoh stok
= *bil hari setahun/NPI*

Accounts receivable turnover
= $\frac{\Sigma \text{ sales}}{\text{accounts receivable}}$

Nisbah pusing ganti penghutang

= $\frac{\Sigma \textit{ Jualan}}{\textit{Penghutang}}$

Asset turnover
= $\frac{\Sigma \text{ Sales}}{\Sigma \text{ Total asset}}$

Nisbah pusing ganti terhadap aset
= $\frac{\Sigma \textit{ Jualan}}{\Sigma \textit{ Jumlah aset}}$

Evaluate ability in generating income (sales) , that is operation efficiency.

Capital Ratio *(Nisbah keumpilan/modal)*

Debt ratio
= Total liability / Total asset

Nisbah jumlah hutang kepada jumlah aset
= Jumlah liabiliti / Jumlah aset

Total debt to equity ratio
= Total liability / Total equity

Nisbah jumlah hutang kepada ekuiti
= Jumlah liabiliti / Jumlah ekuiti

Times-interest earned ratio
= Net profit (before tax & interest) / Interest expense

Nisbah lindungan faedah
= Untung bersih (sebelum tolak faedah dan cukai) / Faedah yang dikenakan

Evaluate financial strength and company's ability to pay long term liability.

Profitability Ratio (*Nisbah keuntungan*)

Gross profit ratio
= Gross profit ÷ sales

Nisbah untung kasar
= Untung kasar÷jualan

Net profit ratio (after tax)
= Net profit (after tax)÷sales

Nisbah untung bersih (selepas cukai)
= Untung bersih (selepas cukai) ÷ Jualan

Rate of return on total asset
= net profit (after tax) ÷ Total asset

Nisbah pulangan terhadap aset
= Untung bersih (selepas cukai) ÷ Jumlah aset

Net profit (before tax)
= Net profit (before tax) ÷ Sales

Nisbah untung bersih (sebelum cukai)
= Untung bersih (sebelum cukai) ÷ Jualan

Rate of return on net equity
= Net profit (after tax) ÷ net equity

Nisbah pulangan terhadap nilai bersih (ekuiti)
= Untung bersih (selepas cukai) ÷ Nilai bersih ekuiti

Measure ability to generate profit

Share or Investment ratios
(*Nisbah pasaran saham*)

Earnings per share ratio (EPS)
= Net profit after tax ÷ number of shares

Nisbah perolehan sesaham (EPS)
= *Untung bersih selepas cukai* / *Bilangan unit saham*

Price/earnings ratio (PER)
= market price per ordinary share ÷ Earnings per share

Nisbah harga saham terhadap perolehan
= *Harga pasaran per saham* / *Nisbah perolehan per saham*

Measure performance in terms of return of investment to shareholders

Example 1

Balance sheet for AB company as of 31st December 2001

Fixed asset			**Ownership Equity**	
Building		129000	Normal share	111,000
Machine	20000		Retained earnings	27,000
Minus provision for depreciation	12000	8000		
Current asset			**Fixed Liability**	25,000
Stock		28,000	Debenture	
Accounts receivable		16,000		
Cash		2000	**Current Liability**	
			Creditors	13,000
			Bank overdraft	7,000
		183,000		183,000

Example1: Solution

1. Current ratio :

$$= \frac{28000 + 16000 + 2000}{13000 + 7000}$$

$$= 2.3 : 1$$

Interpretation : Every RM1 current liability is sustained by RM2.30 of current asset. There is sufficient current asset to pay for all its current liabilities.

2. Acid-Test ratio $= \frac{16000 + 2000}{13000}$

$$= 1.38 : 1$$

Interpretation : Company has RM1.38 of liquid asset to support every RM1 current liability. There is adequate liquid asset. .

(Quick ratio < 1:1 shows that the company has some difficultyies in fulfilling its short term liabilities)

Example 2

AB Ptd Ltd: Financial account for year ending 31st December 2002

Beginning stock	25 000	Sales	150 000
Purchase	95 000		
Cost of goods	120 000		
Minus ending stock	30 000		
Cost of sales	90 000		
Gross profit	60 000		
	150 000		150 000

Profit/Loss account for year ending 31st December 2002

Administrative expenditures	15 000	Gross profit	60 000
Sales expenditure	6 000		
Net profit	39 000		
	60 000		60 000
Company's taxes	12 000	Net profit before taxes	39 000
Net profit after taxes	27 000		
	39 000		39 000

** No dividend was issued.*

Balance Sheet at 31st December 2002

Fixed asset			Equity	
Building		124 000	Normal shares	120 000
Machines	40 000		Reserves	42 000
Minus allocation for depreciation	12 000	28 000	Retained earning	27 000
Current asset			Fixed liability	
Stock		30 000	Loan	12 500
Account receivables		16 000	Current liability	
Cash		15 500	Creditors	12 000
		213 500		213 500

Example 2: Solution

i)Inventory turnover ratio = Cost of goods sold ÷ average inventories

$$= 90\,000 / \frac{(25\,000+30\,000)}{2}$$

= 3.27: 1 (3.27 times per year)

OR 365days/ 3.27

= 111.6 days per cycle

Interpretation: Shows the management's efficiency in using its assets.

ii) Accounts receivables turnover

=150 000/ 16 000

=9.375: 1(9.4 kali setimes per year) or 365/ 9.375

=38.94 days

Interpretation: Average number of days that it takes for customers to pay is 38.94 days

iii) Asset turnover = Sales/ Total asset

= 150000/ 213 500

=0.70:1

Interpretations: The company ia able to generate RM 0.70 for every RM1 it invested in assets. (It is better than 0.60: 1).

Solution (continue)

iv) Liability to equity ratio = Total liability/Total equity

= 24500/ 189000

=0.13: 1

Interpretation: Company's liability is 13 cents for each Ringgit of equity. A declining value shows a stable financial status. Company rely less on external sources of capital.

v) Total liability to total asset ratio

= Total liability / Total asset

= 12 500+ 12 000 / 30 000+ 16000+ 15500+124000+28000

=24500/213500

=0.11:1

Interpretations: From RM1 asset, 11 cents is financed by liability.

Solution (continue)

Profitability Ratios :

vi) Gross profit ratio = Gross profit/ sales

=60 000/ 150 000

=0.4: 1

Interpretations:

Company gets 40 cents gross profit for every RM1 sales.

vii) Net profit ratio (before tax) = Net profit (before tax) / sales

=39 000/ 150 000

= 0.26:1

Interpretations: Shows that the company achieved 26 cents net profit before tax for every RM1 sales. This value is low (operation cost is high)

viii) Net profit ratio (after tax) = Net profit after tax / sales

=27 000/ 150 000

= 0.18:1

Interpretations: It shows low ratio that is, 18 cents of net profit after tax for every RM1 sales, the effect of tax on profit.

Solution (continue)

ix) Rate of return on asset = net profit (after tax) / total asset
= 27000/ 213500
= 0.126:1

Interpretation: Company acquire 12.6 cents net profit after tax for every RM1 investment in asset.

x) Rate of return on net equity = Net profit (after tax)/Net equity
=27000/120000+ 27000+ 42000
= 27000/189000
=0.14:1

Interpretation: Shareholders will receive 14 cent return for every RM1 invested in the company.

Solution (continue)

Share / Investment ratio

Xi) Earnings per share ratio = Net profit (after tax) / Number of shares

(Lets say number of share units are 142 000 units),

=27 000/ 142000

=0.19:1

Interpretations: Company returns 19 cents perunit share.

ii) Price/Earnings ratio = $\frac{\text{Market price per ordinary share}}{\text{Earnings per share}}$

(Lets say market price per share = RM 1.60),

=1.6/0.19

=8.42:1

Interpretations: Cost to acquire a share is 8.42 times its earnings.

Accuracy of Ratio Analysis

Difficult to make comparison if :

- Difference in the operations between companies (stock value, depreciation, income and assets)

- If initial value/cost (historical cost) is used without taking into considerations inflation and current price.
-
- The interaction between companies that uses transfer price complicates comparison.

3.7 Chapter Summary

- Ratio analysis can evaluate the past performance, can serve as a long term guideline for the company.

- Benchmarking – comparison with leading company in a specific industry. Also used between main/critical processes.