

Ratio Analysis

Introduction to Management Accounting

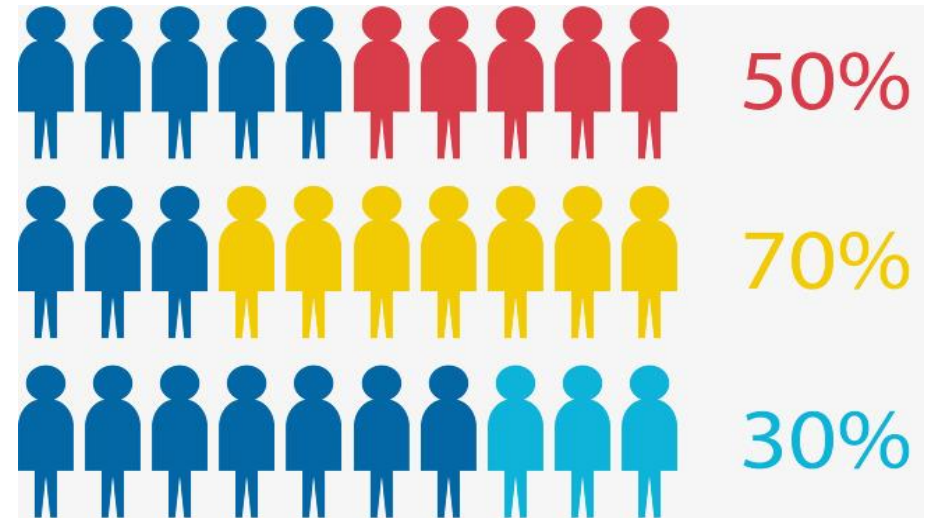
Unit 3

RATIOS

3:7



Ratio Analysis



Financial Ratio

- Ratio shows the relationship between two related financial variables
- Variables are sales, expenses, profit, capital etc.,
- Absolute numbers are not much useful
- Ratio shows the relation between two numbers
- It helps in comparison

NITT Student Cycle Shop

- Investment Rs100000/-
- Purchase 25 cycles @Rs4000 each
- Fit and sell @Rs5000 each

NITT Students Cycle Shop									
Profit and loss a/c for the period from 25.07.2018 to 10.08.2018									
Particulars		Amount Rs	Particulars		Amount Rs			Ratio	
To Purchases (4000x25)		100000	By sales (5000x25)		125000	Gross Profit ratio=	(GP/Sales)x100 =	12	%
To Wages (200x25)		5000							
To carriage In (200x25)		5000							
To Gross profit		15000							
Total		125000	Total		125000				
To Salary		5000	By Gross profit		15000				
To Rent		5000							
To Operating profit		5000				Operating profit ratio=	(OP/sales)x100 =	4	%
Total		15000	Total		15000				
To Interest Charges		0	By operating profit b/d		5000				
To Net Profit		5000				Net profit ratio=	(NP/sales)x100 =	4	%
Total		5000	Total		5000				
Balance sheet as on 10.08.2018									
Particulars		Amount Rs	Particulars		Amount Rs				
Capital	100000		Cash		105000	Return on equity=	(NP/Equity capital)x100 =	5	%
Add:Net Profit	5000	105000							
loan		0							
Total		105000	Total		105000				

NITT Student Cycle Shop

- Investment Rs100000/-
 - Purchase 25 cycles @Rs4000 each
 - Fit and sell @Rs5000 each
 - ROE is just 5%
-
- CHANGE1: Try to reduce the carriage charges

NITT Students Cycle Shop									
Profit and loss a/c for the period from 25.07.2018 to 10.08.2018									
Particulars		Amount Rs	Particulars		Amount Rs			Ratio	
To Purchases (4000x25)		100000	By sales (5000x25)		125000	Gross Profit ratio=	(GP/Sales)x100 =	14	%
To Wages (200x25)		5000							
To carriage In (100x25)		2500							
To Gross profit		17500							
Total		125000	Total		125000				
To Salary		5000	By Gross profit		17500				
To Rent		5000							
To Operating profit		7500				Operating profit ratio=	(OP/sales)x100 =	6	%
Total		17500	Total		17500				
To Interest Charges		0	By operating profit b/d		7500				
To Net Profit		7500				Net profit ratio=	(NP/sales)x100 =	6	%
Total		7500	Total		7500				
Balance sheet as on 10.08.2018									
Particulars		Amount Rs	Particulars		Amount Rs				
Capital	100000		Cash		107500	Return on equity=	(NP/Equity capital)x100 =	7.5	%
Add:Net Profit	7500	107500							
loan		0							
Total		107500	Total		107500				

NITT Student Cycle Shop

- ROE improves to 7.5%

CHANGE2: Now Try to sell the entire lot in three days and get fresh lot once in 3 days
In 15 days time purchase and sell 5 lots of 25 cycles

NITT Students Cycle Shop					
Profit and loss a/c for the period from 25.07.2018 to 10.08.2018					
Particulars		Amount Rs	Particulars		Amount Rs
To Purchases (4000x125)		500000	By sales (5000x125)		625000
To Wages (200x125)		25000			
To carriage In (100x125)		12500			
To Gross profit		87500			
Total		625000	Total		625000
To Salary & Bonus		32500	By Gross profit		87500
To Rent		5000			
To Operating profit		50000			
Total		87500	Total		87500
To Interest Charges		0	By operating profit b/d		50000
To Net Profit		50000			
Total		50000	Total		50000
Balance sheet as on 10.08.2018					
Particulars		Amount Rs	Particulars		Amount Rs
Capital	100000		Cash		150000
Add:Net Profit	50000	150000			
loan		0			
Total		150000	Total		150000

		Ratio	
Gross Profit ratio=	(GP/Sales)x100 =	14	%
Operating profit ratio=	(OP/sales)x100 =	8	%
Net profit ratio=	(NP/sales)x100 =	8	%
Return on equity=	(NP/Equity capital)x100 =	50	%
Number of times investment is rotated		5 times	

NITT Student Cycle Shop

- ROE improves to 50%

CHANGE 3 : Borrow loan of Rs 100000 @10% interest for 15 days
In each lot purchase 50 cycles

Profit and loss a/c for the period from 25.07.2018 to 10.08.2018											
Particulars		Amount Rs	Particulars		Amount Rs			Ratio			
To Purchases (4000x250)		1000000	By sales (5000x250)		1250000	Gross Profit ratio=		(GP/Sales)x100 =		14 %	
To Wages (200x250)		50000									
To carriage In (100x250)		25000									
To Gross profit		175000									
Total		1250000	Total		1250000						
To Salary & Bonus		65000	By Gross profit		175000						
To Rent		5000									
To Operating profit		105000				Operating profit ratio=		(OP/sales)x100 =		8.4 %	
Total		175000	Total		175000						
To Interest Charges		10000	By operating profit b/d		105000						
To Net Profit		95000				Net profit ratio=		(NP/sales)x100 =		7.6 %	
Total		105000	Total		105000						
Balance sheet as on 10.08.2018											
Particulars		Amount Rs	Particulars		Amount Rs						
Capital	100000		Cash		295000	Return on equity=		(NP/Equity capital)x100 =		95 %	
Add:Net Profit	95000	195000									
Loan		100000									
Total		295000	Total		295000						

How ROE Grows to 95%

- $ROE = NP / \text{equity}$
- $= (NP / \text{sales}) \times (\text{sales} / \text{Investment in assets}) \times (\text{inv in asset} / \text{equity})$
- $= \text{NP ratio} \times \text{No. of times Turnover} \times \text{Equity multiplier}$

Break up of Profit and Loss Account for the year ending

A. Net Sales	xxx
B. Cost of Goods sold	<u>xxx</u>
C. Gross Profit (A-B)	xxx
D. Less: Selling & Administrative expenses	<u>xxx</u>
E. Operating income (C-D)	xxx
F. Add: Other income	<u>xxx</u>
G. Earning before interest and tax (EBIT) (E+F)	xxx
H. Less: Interest	<u>xxx</u>
I. Profit before tax (PBT) (G-H)	xxx
J. Provision for tax	<u>xxx</u>
K. Profit after tax (PAT) (I-J)	xxx
L. Dividend distributed	<u>xxx</u>
M. Retained earnings (K-L)	xxx

Break up of Balance Sheet as on...

A. Net Worth			
Equity Share capital	XXXX		
Preference Share capital	XXXX		
Reserves	XXXX		
Net worth			XXXX
B. Long-Term Borrowings			
Long-term: Debentures	XXXX		
Others	XXXX		
Long-term debt	XXXX		
Long-term borrowings			XXXX
C. Capital Employed (A+B)			XXXX
D. Fixed Assets			
Gross block	XXXX		
Less: depreciation	XXXX		
Net block		XXXX	
Other non-current assets		XXXX	
Net fixed assets			XXXX
E. Current Assets			
Inventories:			
Raw material	XXXX		
Stock in process	XXXX		
Finished goods	XXXX		
Inventories		XXXX	
Debtors		XXXX	
Cash and bank balance		XXXX	
Others		XXXX	
Current assets			XXXX
F. Less: Current Liabilities			
Trade creditors		XXXX	
Bank overdraft/cash credit		XXXX	
Provision and others		XXXX	
Current liabilities			XXXX
G. Net Current Assets (E-F)			XXXX
H. Net Assets (D+G)			XXXX

The above statement shows

Application/Uses of financial statement ratios

- Assessing credit worthiness
- Assessing corporate performance
- Valuing equity shares
- Predicting Bond rating
- Estimating market risk
- Forecasting bankruptcy

Types of Ratios

1. Profitability ratio
2. Turnover ratio
3. Leverage ratio
4. Liquidity ratio
5. Valuation ratio

1. Profitability Ratio

Profitability ratios can be computed either from sales or investment.

Profitability Ratios Related to Sales	Profitability Ratios Related to Investments
(i) Profit Margin	(i) Return on Investments
(ii) Expenses Ratio	(ii) Return on Equity
	(iii) EPS

Profit Margin

Gross Profit Margin

Gross profit margin measures the percentage of each sales rupee remaining after the firm has paid for its goods.

$$\text{Gross profit margin} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

Net Profit Margin

Net profit margin measures the percentage of each sales rupee remaining after all costs and expense including interest and taxes have been deducted.

Net profit margin can be computed in three ways

$$\text{i. Operating Profit Ratio} = \frac{\text{Earning before interest and taxes}}{\text{Net sales}}$$

$$\text{ii. Net Profit Ratio} = \frac{\text{Earning after interest and taxes}}{\text{Net sales}}$$

Expenses Ratio

$$\text{i. Cost of goods sold} = \frac{\text{Cost of goods sold}}{\text{Net sales}} \times 100$$

$$\text{ii. Operating expenses} = \frac{\text{Administrative exp.} + \text{Selling exp.}}{\text{Net sales}} \times 100$$

$$\text{iii. Administrative expenses} = \frac{\text{Administrative expenses}}{\text{Net sales}} \times 100$$

$$\text{iv. Selling expenses ratio} = \frac{\text{Selling expenses}}{\text{Net sales}} \times 100$$

$$\text{v. Operating ratio} = \frac{\text{Cost of goods sold} + \text{Operating expenses}}{\text{Net sales}} \times 100$$

$$\text{vi. Financial expenses} = \frac{\text{Financial expenses}}{\text{Net sales}} \times 100$$

Return on Investment

Return on Investments measures the overall effectiveness of management in generating profits with its available assets.

i. Return on Assets (ROA)

$$\text{ROA} = \frac{\text{EAT}}{\text{Average total assets}}$$

Return on Equity

Return on shareholders equity measures the return on the owners (both preference and equity shareholders) investment in the firm.

Return on equity =

$$\frac{\text{Net profit after taxes}}{\text{Average total shareholders' equity}} \times 100$$

$$\frac{\text{Earnings Per Share (EPS)}}{\text{No. of shares outstanding}} = \frac{\text{Net Profit after Tax}}{\text{No. of shares outstanding}}$$

Earnings Per Share – EPS Formula

2. Turnover ratios (or) Efficiency Ratios

- ❖ **Inventory Turnover Ratio**
- ❖ **Debtors Turnover Ratio**
- ❖ **Creditors Turnover Ratio**

Inventory Turnover Ratio

The ratio indicates how fast inventory is sold. A high ratio is good from the viewpoint of liquidity and *vice versa*. A low ratio would signify that inventory does not sell fast and stays on the shelf or in the warehouse for a long time.

$$\text{Inventory turnover ratio} = \frac{\text{Cost of goods sold Or Sales}}{\text{Average inventory}}$$

The cost of goods sold means sales minus gross profit.

The average inventory refers to the simple average of the opening and closing inventory.

Example 1: Inventory Turnover Ratio

A firm has sold goods worth Rs 3,00,000 with a gross profit margin of 20 per cent. The stock at the beginning and the end of the year was Rs 35,000 and Rs 45,000 respectively. What is the inventory turnover ratio?

$$\text{Inventory turnover ratio} = \frac{(\text{Rs } 3,00,000 - \text{Rs } 60,000)}{(\text{Rs } 35,000 + \text{Rs } 45,000) \div 2} = 6 \text{ (times per year)}$$

$$\text{Inventory holding period} = \frac{12 \text{ months}}{\text{Inventory turnover ratio, (6)}} = 2 \text{ months}$$

Debtors Turnover Ratio

The ratio measures how rapidly receivables are collected. A high ratio is indicative of shorter time-lag between credit sales and cash collection. A low ratio shows that debts are not being collected rapidly.

$$\text{Debtors turnover ratio} = \frac{\text{Net credit sales}}{\text{Average debtors}}$$

Net credit sales consist of gross credit sales minus returns, if any, from customers.

Average debtors is the simple average of debtors (including bills receivable) at the beginning and at the end of year.

Example 2: Debtors Turnover Ratio

A firm has made credit sales of Rs 2,40,000 during the year. The outstanding amount of debtors at the beginning and at the end of the year respectively was Rs 27,500 and Rs 32,500. Determine the debtors turnover ratio.

$$\text{Debtors turnover ratio} = \frac{\text{Rs 2,40,000}}{(\text{Rs 27,500} + \text{Rs 32,500}) \div 2} = 8 \text{ (times per year)}$$

$$\text{Debtors collection period} = \frac{12 \text{ Months}}{\text{Debtors turnover ratio, (8)}} = 1.5 \text{ Months}$$

Creditors Turnover Ratio

A low turnover ratio reflects liberal credit terms granted by suppliers, while a high ratio shows that accounts are to be settled rapidly. The creditors turnover ratio is an important tool of analysis as a firm can reduce its requirement of current assets by relying on supplier's credit.

$$\text{Creditors turnover ratio} = \frac{\text{Net credit purchases}}{\text{Average creditors}}$$

Net credit purchases = Gross credit purchases - Returns to suppliers.

Average creditors = Average of creditors (including bills payable) outstanding at the beginning and at the end of the year.

Example 3: Creditors Turnover Ratio

ABC firm has made credit purchases of Rs 1,80,000. The amount payable to the creditors at the beginning and at the end of the year is Rs 42,500 and Rs 47,500 respectively. Find out the creditors turnover ratio.

$$\text{Creditors turnover ratio} = \frac{(\text{Rs } 1,80,000)}{(\text{Rs } 42,500 + \text{Rs } 47,500) \div 2} = 4 \text{ (times per year)}$$

$$\text{Creditor's payment period} = \frac{12 \text{ months}}{\text{Creditors turnover ratio, (4)}} = 3 \text{ months}$$

Asset Turnover Ratio

$$\text{Total asset turnover ratio} = \frac{\text{Cost of Goods sold}}{\text{Average Total assets}}$$

$$\text{Fixed asset turnover ratio} = \frac{\text{Cost of Goods sold}}{\text{Average Net Fixed assets}}$$

3. Leverage(or) Solvency (or) Capital Structure Ratio

There are two aspects of the long-term solvency of a firm:

- (i) Ability to repay the principal when due, and
- (ii) Regular payment of the interest .

Capital structure or leverage ratios throw light on the long-term solvency of a firm.

Accordingly, there are two different types of leverage ratios.

First type: These ratios are computed from the balance sheet

- (a) Debt-equity ratio
- (b) Debt-assets ratio
- (c) Capital gearing ratio

Second type: These ratios are computed from the Income Statement

- (a) Interest coverage ratio
- (b) Debt service coverage ratio

I. Debt-equity ratio

Debt-equity ratio measures the ratio of long-term or total debt to shareholders equity.

$$\text{Debt-equity ratio} = \frac{\text{Total Debt}}{\text{Shareholders' equity fund}}$$

Long-term Debt + Short term debt + Other Current Liabilities = Total external Obligations

If the D/E ratio is high, the owners are putting up relatively less money of their own. It is danger signal for the lenders and creditors. If the project should fail financially, the creditors would lose heavily.

A low D/E ratio has just the opposite implications. To the creditors, a relatively high stake of the owners implies sufficient safety margin and substantial protection against shrinkage in assets.

II. Debt to assets ratio

Debt to asset Ratio

Debt to asset ratio indicates the extent to which borrowed funds support the firms asset.

$$\text{Debt to total assets ratio} = \frac{\text{Total debt}}{\text{Total assets}}$$

III. Capital Gearing ratio

$$\text{Capital Gearing Ratio} = \frac{\text{Loan Capital}}{\text{Equity Capital}}$$

Capital Gearing Ratio

It expresses the relationship between equity capital and fixed interest bearing securities and fixed dividend bearing shares.

$$\text{CGR} = \frac{\text{Fixed interest bearing securities} + \text{fixed dividend bearing shares}}{\text{Equity shareholders funds}}$$

Components of fixed interest bearing securities

- Debentures
- Long-term loans
- Long-term fixed deposits

Components of equity shareholders funds

- Equity share capital
- Accumulated reserves & profits
- Less losses and fictitious assets

IV. Interest Coverage Ratio

Interest coverage ratio

Interest Coverage ratio measures the firm's ability to pay interest

$$\text{Interest coverage ratio} = \frac{\text{EBIT} + \text{Depreciation}}{\text{Interest}}$$

V. Debt service coverage ratio

DEBT SERVICE COVERAGE RATIO

Debt-service coverage ratio (DSCR) is considered a more comprehensive and apt measure to compute debt service capacity of a business firm.

DSCR

=

EAT $+$ Interest $+$ Depreciation $+$ Other Non cash charges

Interest on term loan + Repayment of loan + lease rental

Debt service capacity is the ability of a firm to make the contractual payments required on a scheduled basis over the life of the debt.

4. Liquidity Ratios (or) Short term solvency Ratio

Liquidity ratios measure the ability of a firm to meet its short-term obligations.

Current Ratio

Current Ratio is a measure of liquidity calculated dividing the current assets by the current liabilities

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Particulars	Firm A	Firm B
Current Assets	Rs 1,80,000	Rs 30,000
Current Liabilities	Rs 1,20,000	Rs 10,000
Current Ratio	= 3:2 (1.5:1)	3:1

Quick ratio (or) Acid-Test Ratio

The quick or acid test ratio takes into consideration the differences in the liquidity of the components of current assets.

$$\text{Acid-test Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

$$\text{Quick Assets} = \text{Current assets} - \text{Stock} - \text{Pre-paid expenses}$$

Example 1: Acid-Test Ratio

Cash	Rs 2,000
Debtors	2,000
Inventory	<u>12,000</u>
Total current assets	<u>16,000</u>
Total current liabilities	8,000
(1) Current Ratio	2 : 1
(2) Acid-test Ratio	0.5 : 1

Cash Ratio

Cash ratio measures availability of liquid cash and marketable securities in firm to repay liability.

$$\text{Cash ratio} = \frac{\text{Cash \& bank Balance} + \text{Current investments}}{\text{Current liabilities}}$$

5. Valuation Ratio

- Yield $= (\text{Dividend} + \text{Price Change}) / \text{Initial price}$
- Price earning ratio $= \text{Market price per share} / \text{Earnings per share}$
- Market value to book value $= \text{Market price per share} / \text{Book value per share}$

Du Pont Analysis (or) Integrated Analysis of Ratios

Integrated ratios provide better insight about financial and economic analysis of a firm.

(ii) Du Pont equation

Return on equity = Net profit Margin x Total asset turnover X Equity Multiplier

$$= \frac{\text{Net profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average Total asset}} \times \frac{\text{Average Total Asset}}{\text{Average Equity}}$$

(1) Rate of return on assets (ROA) can be decomposed in to

$(\text{EAT}/\text{Sales}) \times (\text{Sales}/\text{Total assets})$

(i) Net profit margin (EAT/Sales)

(ii) Assets turnover (Sales/Total assets)

(2) Return on Equity (ROE) can be decomposed in to

$(\text{EAT}/\text{Sales}) \times (\text{Sales}/\text{Assets}) \times (\text{Assets}/\text{Equity})$

(i) Net profit margin (EAT/Sales)

(ii) Assets turnover (Sales/Total assets)

(iii) Equity Multiplier (Total assets/Equity)

Problem 5. The Financial statement of Matrix Limited are given below.

(i) Calculate Current ratio, quick ratio, cash ratio, debt equity ratio, interest coverage ratio, inventory turnover ratio, debtors turnover ratio, fixed asset turnover ratio, total asset turnover ratio, Gross profit margin, net profit margin, return on asset, earnings power and return on equity. (ii) Show Dupont decomposition

Matrix limited		
Profit and Loss a/c for the year ending 31.03.2017		
Particulars	Rs in Million	Rs in Million
	2016-2017	2015-2016
Revenue from operation	1065	950
Other income	-	-
Total Revenue	1065	950
Less: Cost of goods sold	805	720
Stock	600	520
wages	120	110
Other manufacturing expenses	85	90
Gross profit	260	230
Less: Operating expenses	90	75
Depreciation	50	40
Selling and general administration	40	35
Profit before interest and tax	170	155
Less: Interest	35	30
Profit before Tax	135	125
Less: Tax	50	45
Profit after tax	85	80
Less: Dividends	35	30
Retained earnings	50	50

Matrix Limited			
Balance sheet as at 31.03.2017			
Particulars	Rs in Million	Rs in Million	
	31.03.2017	31.03.2016	
Equity and Liabilities			
Share holders fund	505	455	
Share capital (Par value Rs10)	125	125	
Reserves and surplus	380	330	
Non Current liabilities	190	205	
Long term borrowings	190	205	
Deffered tax liabilities	0	0	
Long term provisions	0	0	
Current liabilities	240	193	
Short term borrowings	90	55	
Trade payables	100	90	
Other current liabilities	20	18	
Short term provisions	30	30	
Total (A)+(B)= (C)	935	853	
Assets			
Non current assets	570	515	
Fixed assets	550	495	
Non-current investments	20	20	
Long term loans and advances	--	--	
Current assets	365	338	
Current investments	10	5	
Inventories	160	138	
Trade Receivables	120	115	
Cash and cash equivalent	25	20	
Short term loans and advances	50	60	
Total (D)+(E)	935	853	

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$= \frac{365}{240}$$

$$\text{Current ratio} = 1.52$$

$$\text{Acid-test Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

$$\text{Quick Assets} = \text{Current assets} - \text{Stock} - \text{Pre-paid expenses}$$

$$\text{Quick asset} = 365 - 160 = 205$$

$$\text{Quick ratio (or) acid test ratio} = \frac{205}{240}$$

$$\text{Quick ratio} = 0.85$$

$$\text{Cash-flow from operations ratio} = \frac{\text{Cash \& bank Balance} + \text{Current investments}}{\text{Current liabilities}}$$

$$\text{Cash ratio} = \frac{(25 + 10)}{240}$$

$$\text{Cash ratio} = 0.15$$

Problem 5. The Financial statement of Matrix Limited are given below.

(i) Calculate Current ratio, quick ratio, cash ratio, debt equity ratio, interest coverage ratio, inventory turnover ratio, debtors turnover ratio, fixed asset turnover ratio, total asset turnover ratio, Gross profit margin, net profit margin, return on asset, earnings power and return on equity. (ii) Show Dupont decomposition

Matrix limited		
Profit and Loss a/c for the year ending 31.03.2017		
Particulars	Rs in Million	Rs in Million
	2016-2017	2015-2016
Revenue from operation	1065	950
Other income	-	-
Total Revenue	1065	950
Less: Cost of goods sold	805	720
Stock	600	520
wages	120	110
Other manufacturing expenses	85	90
Gross profit	260	230
Less: Operating expenses	90	75
Depreciation	50	40
Selling and general administration	40	35
Profit before interest and tax	170	155
Less: Interest	35	30
Profit before Tax	135	125
Less: Tax	50	45
Profit after tax	85	80
Less: Dividends	35	30
Retained earnings	50	50

Matrix Limited			
Balance sheet as at 31.03.2017			
Particulars	Rs in Million	Rs in Million	
	31.03.2017	31.03.2016	
Equity and Liabilities			
Share holders fund	505	455	
Share capital (Par value Rs10)	125	125	
Reserves and surplus	380	330	
Non Current liabilities	190	205	
Long term borrowings	190	205	
Deffered tax liabilities	0	0	
Long term provisions	0	0	
Current liabilities	240	193	
Short term borrowings	90	55	
Trade payables	100	90	
Other current liabilities	20	18	
Short term provisions	30	30	
Total (A)+(B)= (C)	935	853	
Assets			
Non current assets	570	515	
Fixed assets	550	495	
Non-current investments	20	20	
Long term loans and advances	--	--	
Current assets	365	338	
Current investments	10	5	
Inventories	160	138	
Trade Receivables	120	115	
Cash and cash equivalent	25	20	
Short term loans and advances	50	60	
Total (D)+(E)	935	853	

$$\text{Debt-equity ratio} = \frac{\text{Total Debt}}{\text{Shareholders' equity fund}}$$

$$= \frac{190+240}{505}$$
$$= 430/505$$

$$\text{Debt equity ratio} = 0.85$$

$$\text{Interest coverage ratio} = \frac{\text{EBIT} + \text{Depreciation}}{\text{Interest}}$$

$$= \frac{170+50}{35}$$
$$= 220/35$$

$$\text{Interest coverage ratio} = 6.29$$

Problem 5. The Financial statement of Matrix Limited are given below.

(i) Calculate Current ratio, quick ratio, cash ratio, debt equity ratio, interest coverage ratio, inventory turnover ratio, debtors turnover ratio, fixed asset turnover ratio, total asset turnover ratio, Gross profit margin, net profit margin, return on asset, earnings power and return on equity. (ii) Show Dupont decomposition

Matrix limited		
Profit and Loss a/c for the year ending 31.03.2017		
Particulars	Rs in Million	Rs in Million
	2016-2017	2015-2016
Revenue from operation	1065	950
Other income	-	-
Total Revenue	1065	950
Less: Cost of goods sold	805	720
Stock	600	520
wages	120	110
Other manufacturing expenses	85	90
Gross profit	260	230
Less: Operating expenses	90	75
Depreciation	50	40
Selling and general administration	40	35
Profit before interest and tax	170	155
Less: Interest	35	30
Profit before Tax	135	125
Less: Tax	50	45
Profit after tax	85	80
Less: Dividends	35	30
Retained earnings	50	50

Matrix Limited			
Balance sheet as at 31.03.2017			
Particulars	Rs in Million	Rs in Million	
	31.03.2017	31.03.2016	
Equity and Liabilities			
Share holders fund	505	455	
Share capital (Par value Rs10)	125	125	
Reserves and surplus	380	330	
Non Current liabilities	190	205	
Long term borrowings	190	205	
Deffered tax liabilities	0	0	
Long term provisions	0	0	
Current liabilities	240	193	
Short term borrowings	90	55	
Trade payables	100	90	
Other current liabilities	20	18	
Short term provisions	30	30	
Total (A)+(B)= (C)	935	853	
Assets			
Non current assets	570	515	
Fixed assets	550	495	
Non-current investments	20	20	
Long term loans and advances	--	--	
Current assets	365	338	
Current investments	10	5	
Inventories	160	138	
Trade Receivables	120	115	
Cash and cash equivalent	25	20	
Short term loans and advances	50	60	
Total (D)+(E)	935	853	

$$\text{Inventory turnover ratio} = \frac{\text{Cost of goods sold Or sales}}{\text{Average inventory}}$$

$$= \frac{1065}{(160+138)/2}$$

$$\text{Inventory turnover ratio} = 7.15$$

$$\text{Debtors turnover ratio} = \frac{\text{Net credit sales}}{\text{Average debtors}}$$

$$= \frac{1065}{(120+115)/2}$$

$$\text{Debtors Turnover ratio} = 9.06$$

Problem 5. The Financial statement of Matrix Limited are given below.

(i) Calculate Current ratio, quick ratio, cash ratio, debt equity ratio, interest coverage ratio, inventory turnover ratio, debtors turnover ratio, fixed asset turnover ratio, total asset turnover ratio, Gross profit margin, net profit margin, return on asset, earnings power and return on equity. (ii) Show Dupont decomposition

Matrix limited		
Profit and Loss a/c for the year ending 31.03.2017		
Particulars	Rs in Million	Rs in Million
	2016-2017	2015-2016
Revenue from operation	1065	950
Other income	-	-
Total Revenue	1065	950
Less: Cost of goods sold	805	720
Stock	600	520
wages	120	110
Other manufacturing expenses	85	90
Gross profit	260	230
Less: Operating expenses	90	75
Depreciation	50	40
Selling and general administration	40	35
Profit before interest and tax	170	155
Less: Interest	35	30
Profit before Tax	135	125
Less: Tax	50	45
Profit after tax	85	80
Less: Dividends	35	30
Retained earnings	50	50

Matrix Limited			
Balance sheet as at 31.03.2017			
Particulars	Rs in Million	Rs in Million	
	31.03.2017	31.03.2016	
Equity and Liabilities			
Share holders fund	505	455	
Share capital (Par value Rs10)	125	125	
Reserves and surplus	380	330	
Non Current liabilities	190	205	
Long term borrowings	190	205	
Deffered tax liabilities	0	0	
Long term provisions	0	0	
Current liabilities	240	193	
Short term borrowings	90	55	
Trade payables	100	90	
Other current liabilities	20	18	
Short term provisions	30	30	
Total (A)+(B)= (C)	935	853	
Assets			
Non current assets	570	515	
Fixed assets	550	495	
Non-current investments	20	20	
Long term loans and advances	--	--	
Current assets	365	338	
Current investments	10	5	
Inventories	160	138	
Trade Receivables	120	115	
Cash and cash equivalent	25	20	
Short term loans and advances	50	60	
Total (D)+(E)	935	853	

$$\text{Fixed asset turnover ratio} = \frac{\text{Cost of Goods sold}}{\text{Average Net Fixed assets}}$$

$$= \frac{1065}{(550+495)/2}$$

Fixed asset turnover ratio = 2.04

$$\text{Total asset turnover ratio} = \frac{\text{Cost of Goods sold}}{\text{Average Total assets}}$$

$$= \frac{1065}{(935+853)/2}$$

Total asset turnover ratio = 1.19

Problem 5. The Financial statement of Matrix Limited are given below.

(i) Calculate Current ratio, quick ratio, cash ratio, debt equity ratio, interest coverage ratio, inventory turnover ratio, debtors turnover ratio, fixed asset turnover ratio, total asset turnover ratio, Gross profit margin, net profit margin, return on asset, earnings power and return on equity. (ii) Show Dupont decomposition

Matrix limited		
Profit and Loss a/c for the year ending 31.03.2017		
Particulars	Rs in Million	Rs in Million
	2016-2017	2015-2016
Revenue from operation	1065	950
Other income	-	-
Total Revenue	1065	950
Less: Cost of goods sold	805	720
Stock	600	520
wages	120	110
Other manufacturing expenses	85	90
Gross profit	260	230
Less: Operating expenses	90	75
Depreciation	50	40
Selling and general administration	40	35
Profit before interest and tax	170	155
Less: Interest	35	30
Profit before Tax	135	125
Less: Tax	50	45
Profit after tax	85	80
Less: Dividends	35	30
Retained earnings	50	50

Matrix Limited			
Balance sheet as at 31.03.2017			
Particulars	Rs in Million	Rs in Million	
	31.03.2017	31.03.2016	
Equity and Liabilities			
Share holders fund	505	455	
Share capital (Par value Rs10)	125	125	
Reserves and surplus	380	330	
Non Current liabilities	190	205	
Long term borrowings	190	205	
Deffered tax liabilities	0	0	
Long term provisions	0	0	
Current liabilities	240	193	
Short term borrowings	90	55	
Trade payables	100	90	
Other current liabilities	20	18	
Short term provisions	30	30	
Total (A)+(B)= (C)	935	853	
Assets			
Non current assets	570	515	
Fixed assets	550	495	
Non-current investments	20	20	
Long term loans and advances	--	--	
Current assets	365	338	
Current investments	10	5	
Inventories	160	138	
Trade Receivables	120	115	
Cash and cash equivalent	25	20	
Short term loans and advances	50	60	
Total (D)+(E)	935	853	

$$\text{Gross profit margin} = \frac{\text{Gross profit}}{\text{Sales}} \times 100$$

$$= \frac{260}{1065} \times 100$$

Gross profit Margin = 24.4%

$$\text{Net Profit margin} = \frac{\text{Net profit}}{\text{Sales}} \times 100$$

$$= \frac{85}{1065} \times 100$$

Net profit margin = 7.98%

$$\text{Earnings Power} = \frac{\text{PBIT}}{\text{Average Total asset}} \times 100$$

$$= \frac{170}{(935+853)/2} \times 100$$

Earning Power = 19.02%

Problem 5. The Financial statement of Matrix Limited are given below.

(i) Calculate Current ratio, quick ratio, cash ratio, debt equity ratio, interest coverage ratio, inventory turnover ratio, debtors turnover ratio, fixed asset turnover ratio, total asset turnover ratio, Gross profit margin, net profit margin, return on asset, earnings power and return on equity. (ii) Show Dupont decomposition

Matrix limited		
Profit and Loss a/c for the year ending 31.03.2017		
Particulars	Rs in Million	Rs in Million
	2016-2017	2015-2016
Revenue from operation	1065	950
Other income	-	-
Total Revenue	1065	950
Less: Cost of goods sold	805	720
Stock	600	520
wages	120	110
Other manufacturing expenses	85	90
Gross profit	260	230
Less: Operating expenses	90	75
Depreciation	50	40
Selling and general administration	40	35
Profit before interest and tax	170	155
Less: Interest	35	30
Profit before Tax	135	125
Less: Tax	50	45
Profit after tax	85	80
Less: Dividends	35	30
Retained earnings	50	50

Matrix Limited			
Balance sheet as at 31.03.2017			
Particulars	Rs in Million	Rs in Million	
	31.03.2017	31.03.2016	
Equity and Liabilities			
Share holders fund	505	455	
Share capital (Par value Rs10)	125	125	
Reserves and surplus	380	330	
Non Current liabilities	190	205	
Long term borrowings	190	205	
Deffered tax liabilities	0	0	
Long term provisions	0	0	
Current liabilities	240	193	
Short term borrowings	90	55	
Trade payables	100	90	
Other current liabilities	20	18	
Short term provisions	30	30	
Total (A)+(B)= (C)	935	853	
Assets			
Non current assets	570	515	
Fixed assets	550	495	
Non-current investments	20	20	
Long term loans and advances	--	--	
Current assets	365	338	
Current investments	10	5	
Inventories	160	138	
Trade Receivables	120	115	
Cash and cash equivalent	25	20	
Short term loans and advances	50	60	
Total (D)+(E)	935	853	

$$\text{Return on asset} = \frac{\text{Profit after tax}}{\text{Average total asset}} \times 100$$

$$= \frac{85}{(935+853)/2} \times 100$$

$$\text{Return on asset} = 9.5\%$$

$$\text{Return on equity} = \frac{\text{Profit after tax}}{\text{Average equity}} \times 100$$

$$= \frac{85}{(505+455)/2} \times 100$$

$$\text{Return on equity} = 17.7\%$$

Problem 5. The Financial statement of Matrix Limited are given below.

(i) Calculate Current ratio, quick ratio, cash ratio, debt equity ratio, interest coverage ratio, inventory turnover ratio, debtors turnover ratio, fixed asset turnover ratio, total asset turnover ratio, Gross profit margin, net profit margin, return on asset, earnings power and return on equity. (ii) Show Dupont decomposition

Matrix limited		
Profit and Loss a/c for the year ending 31.03.2017		
Particulars	Rs in Million	Rs in Million
	2016-2017	2015-2016
Revenue from operation	1065	950
Other income	-	-
Total Revenue	1065	950
Less: Cost of goods sold	805	720
Stock	600	520
wages	120	110
Other manufacturing expenses	85	90
Gross profit	260	230
Less: Operating expenses	90	75
Depreciation	50	40
Selling and general administration	40	35
Profit before interest and tax	170	155
Less: Interest	35	30
Profit before Tax	135	125
Less: Tax	50	45
Profit after tax	85	80
Less: Dividends	35	30
Retained earnings	50	50

Matrix Limited			
Balance sheet as at 31.03.2017			
Particulars	Rs in Million	Rs in Million	
	31.03.2017	31.03.2016	
Equity and Liabilities			
Share holders fund	505	455	
Share capital (Par value Rs10)	125	125	
Reserves and surplus	380	330	
Non Current liabilities	190	205	
Long term borrowings	190	205	
Deffered tax liabilities	0	0	
Long term provisions	0	0	
Current liabilities	240	193	
Short term borrowings	90	55	
Trade payables	100	90	
Other current liabilities	20	18	
Short term provisions	30	30	
Total (A)+(B)= (C)	935	853	
Assets			
Non current assets	570	515	
Fixed assets	550	495	
Non-current investments	20	20	
Long term loans and advances	--	--	
Current assets	365	338	
Current investments	10	5	
Inventories	160	138	
Trade Receivables	120	115	
Cash and cash equivalent	25	20	
Short term loans and advances	50	60	
Total (D)+(E)	935	853	

(ii) Du Pont equation

Return on equity = Net profit Margin x Total asset turnover X Equity Multiplier

$$= \frac{\text{Net profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average Total asset}} \times \frac{\text{Average Total Asset}}{\text{Average Equity}}$$

$$= \frac{85}{1065} \times \frac{1065}{(935+853)/2} \times \frac{(935+853)/2}{(505+455)/2}$$

$$= 7.98\% \quad \times \quad 1.19 \quad \times \quad 1.86$$

Return on equity = 17.7%

Ways of using ratios

- Comparing with the standard norms
- Comparing with Industry average
- Comparing with Industry leaders (benchmarks)
- Comparing with previous year ratios
- Projecting the future result

Issues in financial statement analysis

- Window Dressing
- Price level changes
- Variation in accounting policies
- Difficulty in interpreting the ratios
- Lack of Underlying theory
- Conglomerate firms
- Correlation among ratios

Management Accounting



Meaning

Accounting as an information system is the process of identifying, measuring and communicating the economic information of an organization to its users who need the information for decision making.

It identifies transactions and events of a specific entity.

Definition

- A/c is “the art of recording, classifying and summarizing in a significant manner and in terms of money, transactions and events which are in part at least, of a financial character and interpreting the result thereof.”
- Management a/c “is a term used to describe the accounting methods, systems and techniques which coupled with special knowledge and ability assist management in its task of maximizing profits and minimizing losses.”
 - ----- J. Batty


Definition

- ***“Management accounting is the presentation of accounting information in such a way as to assist management in the creation of policy and in the day-to-day operations of an undertaking”- I.C.M.A., London***



NATURE OF MANAGEMENT ACCOUNTING

- **Providing Accounting Information:** Management accounting is based on accounting information. The collection and classification of data is the primary function of accounting department. The information so collected is used by the management for taking policy decisions.
- **Cause and effect analysis:** Financial accounting is limited to the preparation of profit and loss account and finding out the ultimate result, i.e., profit or loss management accounting goes a step further. The 'cause and effect' relationship is discussed in management accounting. If there is a loss, the reasons for the loss are probed. If there is a profit, the factors different expenditures, current assets, interest payables, share capital, etc.

- 
- **Supplies Information and not decision:** The management accountant supplies information to the management. The decisions are to be taken by the top management.
 - **Concerned with forecasting:** The management accounting is concerned with the future. It helps the management in planning and forecasting. The historical information is used to plan future course of action.
 - **Use of Special Techniques and concepts:** management accounting uses special techniques and concepts to make accounting data more useful. The techniques usually used include financial planning and analysis, standard costing, budgetary control, marginal costing, project appraisal, control accounting, etc.
 - **Increase in Efficiency:** The purpose of using accounting information is to increase efficiency of the concern. The efficiency can be achieved by setting up goals for each department.

- **No fixed conventions:** Unlike financial accounting management accounting does not follow fixed rules. There are tools and techniques in management accounting, but its application differs from management to management.
- **Helps in achievement of objectives:** Management accounting is helpful in realizing the enterprise objectives.

Management versus Financial Accounting

	Management Accounting	Financial Accounting
Primary users	Internal – the company’s managers	External – investors and creditors
Purposes of information	Help managers plan and control operations	Help with investment and credit decisions
Focus and time dimension	Relevance of information; focus on the future	Relevance and reliability of information; focus on the past
Type of report	Internal reports No audit needed	Financial statements prescribed by GAAP Audit by CPAs
Scope of information	Detailed reports on a weekly or daily basis	Summarized reports quarterly and/or annually
Behavioral	Concern about how reports affect employee behavior	Concern about adequate disclosure

Scope of Management accounting

- Financial accounting
- Cost accounting
- Budgeting and forecasting
- Inventory control
- Statistical analysis
- Analysis of Data
- Internal Audit
- Tax Audit
- Methods and procedures

Techniques in management accounting



Tools and techniques of Management accounting

- Financial Policy and accounting
- Analysis of Financial statement
- Historical cost accounting
- Budgetary Control
- Standard Costing
- Marginal Costing
- Other Tools-Decision accounting, Revaluations accounting, control accounting
- Management information system

Functions of management accountant

- Planning for control
- Collection of information
- Evaluation
- Reporting
- Administration of Tax
- Appraisal of external environment
- Protection of assets

Advantages of Management Accounting

- Planning
- Controlling
- Coordination
- Performance Evaluation
- Organizing
- Motivating
- Communicating
- Decision-making

LIMITATIONS OF MANAGEMENT ACCOUNTING

- Based on historical data
- Lack of wide knowledge
- Complicated approach
- Costly system
- Developing stage
- Lack of objectivity