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FAST TRACK

FINANCIAL MANAGEMENT

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PREFACE

Dear Student,

Welcome to the World of Knowledge - J.K. Shah Classes !

I have the pleasure of presenting this study material to you. It contains good number of good problems, selected so carefully from wide-ranging sources. It covers the problems which will bring in to focus all important concepts that you need to study in order to fortify yourself for your examination. The subject will be taught by eminent professors who are highly experienced and well-versed with the job.

The coaching is very exhaustive and wholly concept based. The conceptual explanations are entirely supported by good problems that cover the past and the problems which peep into the future. Also, the coaching is very systematic, well - planned and absolutely time bound. For a change, say good - bye to mechanical learning. I am sure you will feel that the study is a pleasurable job and not a painful exercise.

Each Topic of Financial Management is divided in to three parts :

(A) Theory Section : This section covers theory related to the topic.

(B) Classwork Section : This section covers good number of quality problems which will be solved in the classroom.

(C) Homework Section : This section covers good number of problems. Students are strongly advised to solve these problems.

Each Topic of Economics for Finance is Divided into 2 Parts:

A. Classwork Section : This section includes coverage of all conceptual questions as well as numerical questions.

B. Additional Questions: This section emphasizes on extra questions which will help in deeper understanding of the topics already covered in classwork section. This section is to be done after completing syllabus.

I wish you a very happy study time.

BEST OF LUCK !

Prof. J.K. Shah.
Chartered Accountant

FINANCIAL MANAGEMENT

INDEX

FINANCIAL ANALYSIS AND PLANNING – RATIO ANALYSIS

THEORY SECTION

Meaning and Objective

Ratio is relationship between two variables to arrive at a meaningful result. Absolute figures do not communicate any meaningful result and hence the need for ratios. Ratios also help in comparing the performance of the company with that of its competitors as well as with the company's own performance of last year.

Scope

In this chapter we will learn to:

(a) Calculate ratios from the given financial statements.

(b) Prepare Financial Statements from the given ratios.

(c) Calculate ratios and interpretation of the results.

Types of Ratios

All the ratios which we will learn under this chapter can broadly be classified into 3 types.

- Balance Sheet Ratios (numerator and denominator comes from Balance Sheet)
- Profit and Loss Ratios (numerator and denominator comes from P & L)
- Mixed Ratios (Numerator from P&L and denominator from Balance Sheet)

(A) BALANCE SHEET RATIOS

Balance Sheet Ratios are also known as Solvency ratios, as they test the solvency (ability to pay) position of the company. These ratios are calculated in pure numbers (2, 1.5, 3, etc.). The lenders and the creditors of the company generally use these ratios.

We need to learn the following set of ratios under the head Balance Sheet Ratios

- Current Ratio
- Quick Ratio
- Super Quick Ratio

- Stock to Working Capital Ratio
- Debt Equity Ratio
- Capital Gearing Ratio
- Proprietary Ratio

- **Current Ratio**

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

This Ratio indicates the ability of the company to pay its current liabilities with the help of current assets. The standard Ratio is considered to be 2:1, which indicates that against every 1 rupee of current liability the company is having 2 rupees of current assets to pay its current liabilities as at the balance sheet date. It is a test of short term solvency position. A very low ratio indicates unsatisfactory liquidity position & a very high ratio shows inefficient utilization of funds.

- **Quick Ratio**

$$= \frac{\text{Quick Assets}}{\text{Current Liabilities}} = \frac{\text{Current Assets - Stock - Prepaid Expenses}}{\text{Current Liabilities}}$$

Quick Ratio indicates the ability of the company to pay the quick liabilities or immediate liabilities with the help of Quick Assets. Quick Assets are those current assets which are immediately convertible into cash without any loss of time or value. The standard ratio is 1:1, which indicates that against every 1 rupee of current liability the company is having 1 rupee of quick asset to repay its current liability. It is a measure of immediate solvency position. Quick ratio is also known as Acid test ratio, Liquid Ratio or 1:1 Ratio.

Note: Many times Bank overdraft is deducted from current liabilities to arrive at quick liabilities.

- **Super Quick Ratio**

$$= \frac{\text{Cash and Bank + Marketable Securities}}{\text{Current Liabilities}}$$

This ratio is also known as Absolute Liquidity Ratio, Cash Ratio, Cash Reservoir Ratio. This ratio indicates that against 1 rupee of current liability how cash and near cash is available with the company to pay the current liability.

- **Stock to Working Capital Ratio**

$$= \frac{\text{Closing Stock}}{\text{Working Capital}}$$

This ratio indicates the extent to which the working capital of the company is blocked in the form of stock. Lower the ratio, higher is the liquidity with the company.

- **Debt Equity Ratio**

$$= \frac{\text{Debt}}{\text{Equity}}$$

It indicates the proportion of funds belonging to the outsiders to that of the shareholders. The standard ratio of 2 : 1 which indicates that against 1 rupee of shareholders fund raised the company has raised 2 rupees from outsiders. Debt Equity ratio is a measure of financial risk. Higher the Debt Equity ratio higher is the financial risk. Debt equity ratio is also known as Financial Leverage or Banker's Ratio.

Debt = Total Long Term Loans.

Equity = Equity Share capital + Preference Share Capital + Reserves and Surplus

- **Capital Gearing Ratio**

$$= \frac{\text{Funds entitled to Fixed Interest + Fixed Dividend}}{\text{Funds not entitled for Fixed Interest + Fixed Dividend}}$$

$$= \frac{\text{Debt + Preference Share Capital}}{\text{Equity Shareholders Funds}}$$

Equity Shareholders funds = Equity share Capital + Reserves and Surplus

This ratio is an extended version of Debt Equity Ratio. It indicates proportion of funds entitled for fixed commitment (in the form of interest or dividend) to that of funds not entitled for fixed commitment.

In absence of Preference Share capital, Capital Gearing Ratio = Debt Equity Ratio. The word gearing indicates risk. High gearing indicate high risk and vice versa.

- **Proprietary Ratio**

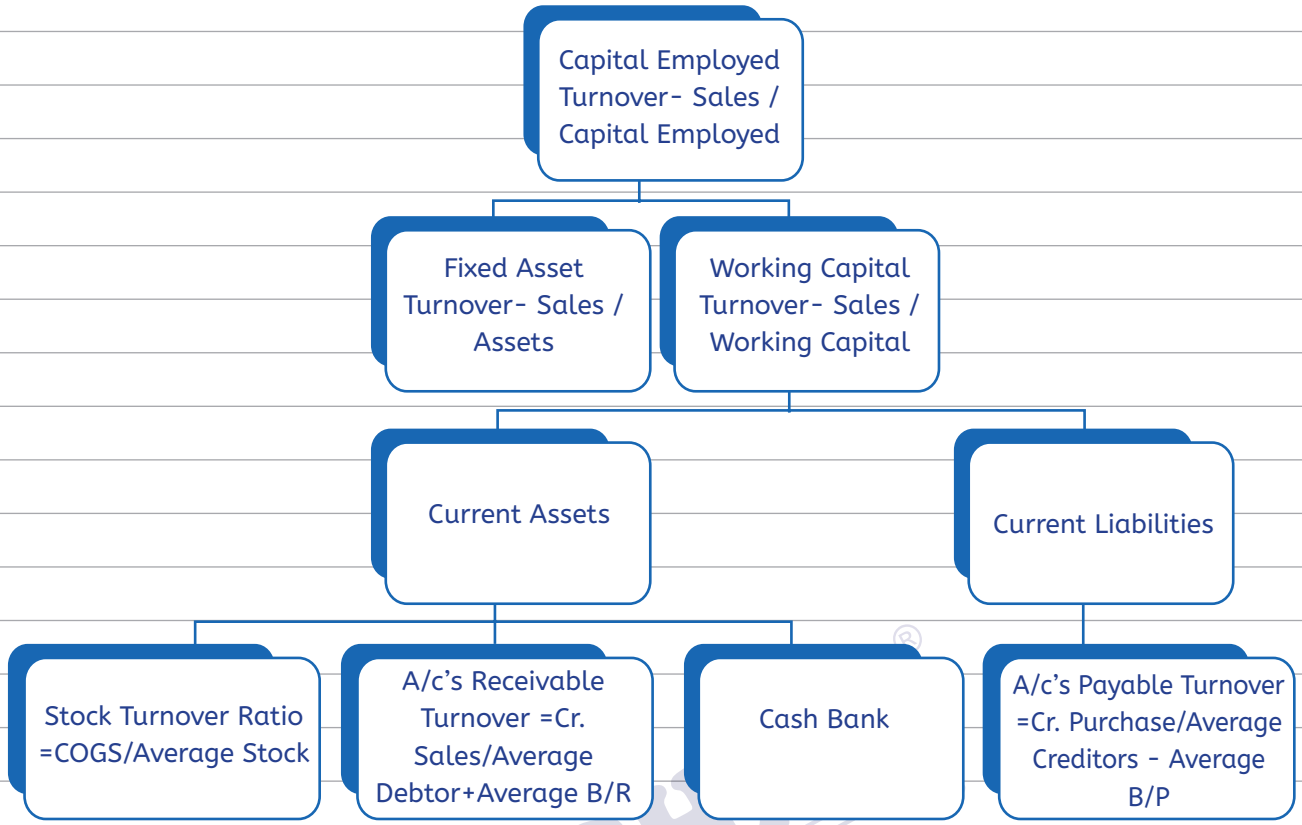
$$= \frac{\text{Proprietors Funds}}{\text{Total Assets}}$$

This ratio indicates the extent to which the total assets of the company are financed by the shareholders. Higher the ratio better is the long term stability. Total Assets = Fixed Assets + Long term Investment + Current Assets.

(B) MIXED RATIOS

In mixed ratio numerator comes from P&L and denominator from Balance Sheet. Since the P&L figures are generally for the whole year and the Balance Sheet as at a particular date, there exists a timing difference between the numerator and the denominator and hence, to eliminate the timing difference we take average of the Balance Sheet figure. Average = (opening balance + closing balance)/2. In absence of information about the opening balances, closing balance sheet figures are to be considered.

- **Turnover Ratios**
  - Turnover Ratios are also known as Activity Ratios, Performance Ratios or Velocity Ratios. These ratios are always computed in times and hence are also known as Times Ratios (e.g. 4 times, 10 times, etc.)
  - We have to learn the following ratios under this head
  - Capital Employed Turnover.
  - Fixed Asset Turnover.
  - Working Capital Turnover.
  - Stock Turnover.
  - Accounts Receivable (or Debtors) Turnover.
  - Accounts Payable (or Creditors) Turnover.



Capital Employed turnover ratio

This Ratio indicates how efficiently the money invested in the business is used during the year to generate sales.

Fixed Assets Turnover Ratio

This ratio indicates how efficiently the fixed assets were used during the year for generating sales.

Working Capital Turnover Ratio

This Ratio indicates how well the money invested in working capital was used during the year for generating sales.

Stock Turnover Ratio

This ratio indicates how many times the stock was turned over i.e. how many times the stock that was purchased was sold during the year. Higher the ratio efficient is the inventory management. This ratio is useful for calculating the average holding period of stock

$$\text{Average Holding Period} = \frac{\text{Average Stock}}{\text{COGS}} \times 365/52/12$$

A/c's Receivable Turnover (or Debtors Turnover)

This ratio indicates how many times the debtors were turned over i.e. how many times cash was collected from customers for the goods sold during the year. Higher the ratio efficient is the receivables management. This ratio is useful for calculating the average collection period.

$$\text{Average Collection Period} = \frac{\text{Average Debtors (+) Average B/R}}{\text{Cr. Sales}} \times 365/52/12$$

A/c's Payable Turnover (or Creditors Turnover)

This ratio indicates how many times the creditors were turned over i.e. how many times cash was paid to the suppliers for the goods that were purchased. This ratio is useful for calculating the average payment period.

$$\text{Average Payment Period} = \frac{\text{Average Creditors (+) Average B/P}}{\text{Cr. Purchases}} \times 365/52/12$$

PROFITABILITY RATIOS IN RELATION TO INVESTMENT

Other set of ratios in mixed ratios is profitability ratios in relation to investment

$$\text{Rate of Return Investment} = \frac{\text{Profit}}{\text{Investment}} \times 100$$

Return on Capital Employed (ROCE) / Return on Investment (ROI)

$$\text{ROCE} = \frac{\text{EBIT}}{\text{Average Capital Employed}} \times 100$$

This ratio is an indicator of the earning power of the business. It indicates how much returns has the business earned during the year in % terms on the money employed in the business.

Capital Employed = Shareholders Funds + Loan Funds

Return on Shareholders' Funds

$$= \frac{\text{Earnings After Tax}}{\text{Shareholders Funds}} \times 100$$

This ratio indicates how much returns the company has earned for shareholders during the year have earned on their funds in % terms

Return on Equity (Equity share-holders Funds)

$$\frac{\text{EAT - Preference Dividend}}{\text{Paid - up Equity Share Capital}} \times 100$$

This ratio indicates how much returns the company has earned for equity shareholders during the year on their investments in % terms.

Return on Equity Share Capital

$$\frac{\text{EAT - Preference Dividend}}{\text{Paid - up Equity Share Capital}} \times 100$$

This ratio indicates how much returns the company has earned for equity shareholders during the year on the share capital in % terms. Equity share capital is also known as ordinary capital/common stock.

(C) PROFIT AND LOSS RATIOS

These ratios are also known as profitability ratios in relation to sales.

In this segment we have to learn the following ratios

- Gross Profit Ratio
- Operating Profit Ratio
- Operating Ratio
- Administrative Expenses Ratio
- Selling Expenses Ratio
- Net Profit Ratio

Gross Profit Ratio

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

This ratio indicates the trading profitability. Higher the gross margin the better it is.

Operating Profit Ratio

$$= \frac{\text{Operating Profit (EBIT)}}{\text{Sales}} \times 100$$

This ratio indicates the operating profitability. Higher the operating margins better it is.

Operating Ratio

= 1 – operating profit ratio

OR

$$\frac{\text{COGS - Admn. expenses - Selling expenses + Depreciation}}{\text{Sales}} \times 100$$

Administrative Expenses Ratio

$$= \frac{\text{Administrative Expenses}}{\text{Sales}} \times 100$$

This ratio indicates that to generate sales how much admin expenses have been incurred in % terms.

Selling Expenses Ratio

$$= \frac{\text{Selling Expenses}}{\text{Sales}} \times 100$$

This ratio indicates that to generate sales how much selling expenses have been incurred in % terms.

Net Profit Ratio

$$= \frac{\text{Net Profit After Tax}}{\text{Sales}} \times 100$$

SOME OTHER IMPORTANT RATIOS

Earnings per Share (EPS)

$$= \frac{\text{Earnings for Equity Shareholders}}{\text{No. of Equity Shares}}$$

Dividend per Share (DPS)

$$= \frac{\text{Equity Dividend}}{\text{No. of Equity Shares}}$$

Dividend Payout (DP) Ratio

$$= \frac{\text{Dividend per Share}}{\text{Equity per Share}} \times 100$$

Retention Ratio

$$= \frac{EPS - DPS}{EPS} \times 100 \quad OR \quad 1 - \text{Payout Ratio}$$

Book (Balance Sheet) Value per share (BVPS)

$$= \frac{\text{Equity Shareholders Funds}}{\text{No. of Equity Shares}}$$

Price Earnings Ratio (PE Ratio)

$$= \frac{MPS}{EPS}$$

PE Ratio is popularly known as PE multiple. This ratio indicates how many times an investor is willing to pay to earn 1 rupee of EPS. PE ratio is one factor that determines the MPS.

MPS = PE x EPS.

Earnings Price Ratio / Earnings Yield Ratio

$$= \frac{EPS}{MPS} \times 100$$

Yield is defined as the rate of return on the amount invested. The above ratio is a return on investment ratio. It indicates how much returns an investor has earned on his investment in percentage terms.

Dividend Price Ratio / Dividend Yield Ratio

$$= \frac{DPS}{MPS} \times 100$$

It indicates how much returns in the form of Dividend an investor has earned on his investment in percentage terms.

Interest Coverage Ratio (IC Ratio)

$$= \frac{EBIT}{Interest}$$

This ratio is also called the times interest earned ratio and it measures the ability of the firm to pay the fixed interest liability. It may be noted that EBIT is operating profits of the firm, therefore, the IC ratio measures as to how many times the interest liability of the firm is covered with the operating profits of the firm.

Preference Dividend Coverage Ratio

$$= \frac{\text{PAT}}{\text{Preference Dividend}}$$

This ratio attempts to measure the ability of the firm to pay fixed preference dividend and tells us how secure the preference dividend is in relation to the earning power of the company.

Debt Service Coverage Ratio

$$= \frac{\text{NPAT - Depreciation + Amortisation + Interest}}{\text{Annual Instalment of Loan Interest}}$$

This ratio calculates the company's ability to repay loan instalment + payment of interest. Higher the ratio better it is.

DU PONT ANALYSIS FOR EVALUATING ROE

$$\text{ROE} = \frac{\text{NPAT}}{\text{Equity}} \times 100$$

$$= \frac{\text{NPAT}}{\text{Sales}} \times 100 \times \frac{\text{Sales}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Sales}}$$

= NP Ratio x Asset Turnover Ratio x Equity Multiplier

XYZ LTD

BALANCE SHEETAS AT 31ST MARCH...

PARTICULARS	RS	RS
SOURCES OF FUNDS		
A) SHAREHOLDERS FUNDS		
Share Capital	xx	
Reserves and Surplus	xx	
		xx
B) BORROWED FUNDS		
Secured Loans	xx	
Unsecured Loans	xx	xx
TOTAL SOURCES OF FUNDS/CAPITAL EMPLOYED		xxxx
APPLICATIONS OF FUNDS		
C) FIXED ASSETS		
Gross Block	xx	
Less: Provision for Depreciation	(xx)	
Net Block/ WDV		xx
D) LONG TERM INVESTMENTS		xx
E) WORKING CAPITAL	xx	
Current Assets	xx	xx
Less: Current Liabilities	(xx)	
TOTAL APPLICATION OF FUNDS		xxxx

PROFIT AND LOSS STATEMENT FOR THE YEAR END 31ST MARCH...

PARTICULARS	RS	RS
Sales		xx
Less: Cost of Goods Sold (COGS)		(xx)
Gross Profit		xx
Operating Expenses		
Administrative Expenses	xx	
Selling Expenses	xx	
Depreciation	xx	xx
Operating Profits		xx
Less: Non Operating Expenses		(xx)
Add: Non Operating Incomes		xx
Earnings before Interest and Tax (EBIT)		xx
Less: Interest		(xx)
Earnings before Tax (EBT)		xx
Less: Tax		(xx)
Earnings after Tax (EAT)		xx
Less: Preference Dividend		(xx)
Earnings for Equity Shareholders		xx
Less: Equity Dividend		(xx)
Retained Earnings		xx

Important Points to remember

- Shareholder's funds are also known as **Owner's Funds, Proprietors Funds, Net Worth or Equity**
- Borrowed Funds are also known as **Debt or Loan Funds**
- **Capital Employed** is Debt + Equity
- **Shareholder's Funds** = Share Capital + Reserves and Surplus – Miscellaneous Expenditures not w/off
- **Fundamental Balance Sheet Equation**

  Shareholder's Funds + Borrowed Funds = Fixed Assets + LT Investments +Working Capital

CLASSWORK SECTION

Question 1

Following is the abridged Balance Sheet of Alpha Ltd.:

Liabilities	₹	Assets	₹	₹
Share Capital	1,00,000	Land and Buildings		80,000
Profit and Loss Account	17,000	Plant and Machineries	50,000	
Current Liabilities	40,000	Less: Depreciation	15,000	35,000
				1,15,000
		Stock	21,000	
		Receivable	20,000	
		Bank	1,000	42,000
Total	**1,57,000**	**Total**		**1,57,000**

With the help of the additional information furnished below, you are required to prepare Trading and Profit & Loss Account and a Balance Sheet as at 31st March, 2020:

(i) The company went in for reorganisation of capital structure, with share capital remaining the same as follows:

Share Capital	50%
Other Shareholder's funds	15%
5% Debentures	10%
Payables	25%

Debentures were issued on 1st April, interest being paid annually on 31st March.

(ii) Land and Buildings remained unchanged. Additional plant and machinery has been bought and a further ₹ 5,000 depreciation written off.
(The total fixed assets then constituted 60% of total fixed and current assets.)

(iii) Working capital ratio was 8: 5.

(iv) Quick assets ratio was 1: 1.

(v) The receivables (four-fifth of the quick assets) to sales ratio revealed a credit period of 2 months. There were no cash sales.

(vi) Return on net worth was 10%.

(vii) Gross profit was at the rate of 15% of selling price.

Ignore Taxation.

Question 2

MN Limited gives you the following information related for the year ending 31st March, 2020:

(1)	Current Ratio	2.5: 1
(2)	Debt-Equity Ratio	1: 1.5
(3)	Return on Total Assets (After Tax)	15%
(4)	Total Assets Turnover Ratio	2
(5)	Gross Profit Ratio	20%
(6)	Stock Turnover Ratio	7
(7)	Current Market Price per Equity Share	₹ 16
(8)	Net Working Capital	₹ 4, 50,000
(9)	Fixed Assets	₹ 10, 00,000
(10)	60,000 Equity Shares of	₹ 10 each
(11)	20,000, 9% Preference Shares of	₹10 each
(12)	Opening Stock	₹ 3, 80,000

You are required to calculate:

(i) Quick Ratio

(ii) Fixed Assets Turnover Ratio

(iii) Proprietary Ratio

(iv) Earnings per Share

(v) Price-Earning Ratio.

Question 3

The following figures and ratios are related to a company:

(i)	Sales for the year (all credit)	₹ 90,00,000
(ii)	Gross Profit ratio	35 percent
(iii)	Fixed assets turnover (based on cost of goods sold)	1.5
(iv)	Stock turnover (based on cost of goods sold)	6
(v)	Liquid ratio	1.5:1
(vi)	Current ratio	2.5:1
(vii)	Receivables (Debtors) collection period	1 month
(viii)	Reserves and surplus to Share capital	1:1.5
(ix)	Capital gearing ratio	0.7875
(x)	Fixed assets to net worth	1.3 : 1

You are required to PREPARE:

(a) Balance Sheet of the company on the basis of above details.

(b) The statement showing working capital requirement, if the company wants to make a provision for contingencies @ 15 percent of net working capital.

Question 4

The following information of ASD Ltd. relate to the year ended 31st March, 2022:

Net profit	8% of sales
Raw materials consumed	20% of Cost of Goods Sold
Direct wages	10% of Cost of Goods Sold
Stock of raw materials	3 months' usage
Stock of finished goods	6% of Cost of Goods Sold
Gross Profit	15% of Sales
Debt collection period	2 Months (All sales are on credit)
Current ratio	2 : 1
Fixed assets to Current assets	13 : 11
Fixed assets to sales	1 : 3
Long-term loans to Current liabilities	2 : 1
Capital to Reserves and Surplus	1 : 4

You are required to PREPARE-

(a) Profit & Loss Statement of ASD Limited for the year ended 31st March, 2022 in the following format.

Particulars	(₹)	Particulars	(₹)
Direct Materials consumed	?	By Sales	?
Direct Wages	?		
Works (Overhead)	?		
Gross Profit c/d	?		
	?		?
Selling and Distribution Expenses	?	By Gross Profit b/d	?
Net Profit	?		
	?		?

(b) Balance Sheet as on 31st March, 2022 in the following format.

Liabilities	(₹)	Assets	(₹)
Share Capital	?	Fixed Assets	1,30,00,000
Reserves and Surplus	?	Current Assets:	
Long term loans	?	Stock of Raw Material	?
Current liabilities	?	Stock of Finished Goods	?
		Debtors	?
		Cash	?
	?		?

Question 5

From the following figures and ratios draw out Balance Sheet and Trading and Profit and Loss Account:

(a)	Share Capital	₹ 1,80,000
(b)	Working Capital	₹ 63,000
(c)	Bank O/D	₹ 10,000

There is no fictitious asset. In Current Assets there are no assets other than stock, Debtors and Cash. Closing Stock is 20% higher than the Opening Stock.

i.	Current Ratio	2.5
ii.	Quick Ratio	1.5
iii.	Proprietary Ratio (Fixed Assets : Proprietary Fund)	0.7
iv.	Gross Profit Ratio	20% (to sales)
v.	Stock Velocity	4
vi.	Debtors' Velocity	36.5 days
vii.	Net Profit Ratio	10%

LEVERAGES

THEORY SECTION

Meaning and Scope

The term leverage, in general, refers to the relationship between two interrelated variables of which one variable is dependent on the other.

Formula for calculating Leverage

$$= \frac{\%\text{ change in dependent variable}}{\%\text{ change in independent variable}}$$

In this chapter we have to learn and calculate 3 leverages :

1. Operating Leverage
2. Financial Leverage
3. Combined Leverage

Operating Leverage

Income Statement for calculating Operating Leverage

Sales	xx..... (independent)
Less: Variable Cost	xx
Contribution	xx
Less: Operating Fixed Cost	xx
EBIT	xx..... (dependent)

$$\text{Operating Leverage} = \frac{\%\text{ change in EBIT}}{\%\text{ change in Sales / Contribution}}$$

OR

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

Operating Leverage is a measure of operating risk. Operating risk comes into existence due to presence of operating fixed cost (e g: Fixed salaries, rent, etc.) Operating Leverage indicates the tendency of the EBIT to change disproportionately due to change in sales.

Operating Leverage of 1 indicates no operating risk. The higher the operating leverage higher is the operating risk. OL is unavoidable.

Financial Leverage

Income statement for financial leverage

EBIT	xx .....(independent)
Less: Interest	xx
EBT	xx
Less: Tax	xx
EAT	xx
Less: Preference dividend	(xx)
Earnings for equity shareholders	xx.....(dependent)
:- No of equity shares	xx
EPS	xx.....(dependent)

$$\text{Financial Leverage} = \frac{\%\text{ change in EPS / Earning for Equity shareholders}}{\%\text{ change in EBIT}}$$

OR

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBIT} - \frac{\text{Preference dividend}}{(1 - \text{tax rate})}}$$

Financial Leverage is a measure of financial risk and financial risk comes into existence due to presence of fixed finance cost (e.g. interest, preference dividend). It indicates the tendency of the EPS / Earnings for equity shareholders to change disproportionately due to change in EBIT. FL of 1 indicates no financial risk. The higher the financial leverage higher is the financial risk. FL is avoidable

Combined Leverage

$$\text{Combined Leverage} = \frac{\%\text{ change in EPS / Earnings for Equity shareholders}}{\%\text{ change in sales}}$$

OR

$$\text{Combined Leverage} = \frac{\text{Contribution}}{\text{EBT} - \frac{\text{Preference dividend}}{(1 - \text{tax rate})}}$$

OR

$$\text{Combined Leverage} = \text{Operating Leverage} \times \text{Financial Leverage}$$

It is a measure of total risk.

CLASSWORK SECTION

Question 1

Following is the Balance Sheet of Soni Ltd. as on 31st March, 2023:

Liabilities	Amount in ₹
Shareholder's Fund	
Equity Share Capital (₹ 10 each)	25,00,000
Reserve and Surplus	5,00,000
Non-Current Liabilities (12 Debentures)	50,00,000
Current Liabilities	20,00,000
Total	1,00,00,000
Assets	**Amount in ₹**
Non-Current Assets	60,00,000
Current Assets	40,00,000
Total	1,00,00,000

Additional Information:

(i) Variable Cost is 60% of Sales.

(ii) Fixed Cost p.a. excluding interest ₹ 20,00,000.

(iii) Total Asset Turnover Ratio is 5 times.

(iv) Income Tax Rate 25% You are required to:

(1) Prepare Income Statement

(2) Calculate the following and comment:

(a) Operating Leverage

(b) Financial Leverage

(c) Combined Leverage

Question 2

The following data is available for Stone Ltd.:

	(₹)
Sales	5,00,000
(-) Variable cost @ 40%	2,00,000
Contribution	3,00,000
(-) Fixed cost	2,00,000
EBIT	1,00,000
(-) Interest	25,000
Profit before tax	75,000

Using the concept of leverage, find out

(i) The percentage change in taxable income if EBIT increases by 10%.

(ii) The percentage change in EBIT if sales increases by 10%.

(iii) The percentage change in taxable income if sales increases by 10%.

Also verify the results in each of the above case.

Question 3

A firm has sales of ₹ 75,00,000 variable cost is 56% and fixed cost is ₹ 6,00,000. It has a debt of ₹ 45,00,000 at 9% and equity of ₹ 55,00,000.

(i) What is the firm's ROI?

(ii) Does it have favourable financial leverage?

(iii) If the firm belongs to an industry whose capital turnover is 3, does it have a high or low capital turnover?

(iv) What are the operating, financial and combined leverages of the firm?

(v) If the sales is increased by 10% by what percentage EBIT will increase?

(vi) At what level of sales the EBT of the firm will be equal to zero?

(vii) If EBIT increases by 20%, by what percentage EBT will increase?

Question 4

The Capital structure of RST Ltd. is as follows:

	(₹)
Equity Share of ₹ 10 each	8,00,000
10% Preference Share of ₹ 100 each	5,00,000
12% Debentures of ₹ 100 each	7,00,000
	20,00,000

Additional Information:

- Profit after tax (Tax Rate 30%) are ₹ 2,80,000
- Operating Expenses (including Depreciation ₹ 96,800) are 1.5 times of EBIT
- Equity Dividend paid is 15%
- Market price of Equity Share is ₹ 23

Calculate:

(i) Operating Leverage, Financial Leverage, combined Leverage, EPS & Sales

(ii) Cover for preference and equity dividend

(iii) The Earning Yield Ratio and Price Earning Ratio

(iv) The Net Fund Flow

CAPITAL STRUCTURE

THEORY SECTION

Meaning and Objective

The Dictionary meaning of the word Capital is "money required to start or run the business" and Structure means "arrangement". The objective of this chapter is to give the answer to the following question:

"How to arrange the money required to start or run the business?"

We should arrange capital or money in such a manner that the wealth of the shareholders increases and wealth of the shareholders increases when the MPS of the shares increases. Other things being constant MPS will increase when the EPS increases. In short, raise money in such a manner which helps us to maximises the EPS.

Scope

In this chapter we will learn:

1. How to select the Financial Plan.
2. Calculation of Indifference Level and its importance.
3. Calculation of Financial Break-even Level and its importance.

Indifference Level

Indifference level or indifference point is that level of EBIT where equity shareholders are indifferent between two plans i.e. at indifference level of EBIT, the EPS of two financial plans is the same.

At Indifference Level,

EPS (plan 1) = EPS (plan 2)

Financial Break Even Point / Financial Break Even Level (F-BEP)

F-BEP is that level of EBIT, where the equity shareholders break even i.e. they are neither at profit nor at loss. It is that level of EBIT, where EPS of a particular plan is zero. F-BEP is that minimum level of EBIT which a plan should generate else the equity shareholders

will be at a loss. F-BEP is a measure of Financial Risk. Higher the financial Break even, higher is the financial risk. F-BEP of 0 indicates no financial risk.

$$F - BEP = Interest + \frac{Preference\ Dividend}{(1 - tax\ rate)}$$

Importance of Indifference level and F-BEP

Indifference level along with F-BEP helps in selection of a particular plan. If the expected EBIT is more than the Indifference Level, select that plan which has higher F-BEP as EPS will be more. If the expected EBIT is less than indifference level, then select that plan which has lower F-BEP as EPS will be more. If expected EBIT is equal to indifference level then go for any plan.

CLASSWORK SECTION

Question 1

The Adarsh Ltd. is considering methods to finance its investment proposal. It is estimated that initially ₹ 4,00,000 will be needed. Two alternative methods of raising funds are available to the firm: (a) Issue of 15% Loan amounting to ₹ 2,00,000 and issue of 2,000 equity shares of ₹ 100 each; and (b) Issue of 4,000 equity shares of ₹ 100 each. The appropriate tax rate is 35 per cent.

(i) Assuming operating profits (EBIT) of: (a) ₹ 70,000, and (b) ₹ 80,000, which financing proposal would you recommend and why?

(ii) Compute the indifference point of the two financial plans & also verify the same.

(iii) Calculate FBEP.

(iv) Also determine two EBIT – EPS co-ordinates for each plan.

Question 2

The particulars relating to Raj Ltd. for the year ended 31 st March, 2022 are given as follows:

Output (units at normal capacity)	1,00,000
Selling price per unit	₹ 40
Variable cost per unit	₹ 20
Fixed cost	₹ 10,00,000

The capital structure of the company as on 31st March, 2022 is as follows:

Particulars	Amount in ₹
Equity share capital (1,00,000 shares of ₹ 10 each)	10,00,000
Reserves and surplus	5,00,000
Current liabilities	5,00,000
Total	20,00,000

Raj Ltd. has decided to undertake an expansion project to use the market potential that will involve ₹ 20 lakhs. The company expects an increase in output by 50%. Fixed cost will be increased by ₹ 5,00,000 and variable cost per unit will be decreased by 15%. The additional output can be sold at the existing selling price without any adverse impact on the market.

The following alternative schemes for financing the proposed expansion program are planned:

		(Amount in ₹)
Alternative	Debt	Equity Shares
1	5,00,000	Balance
2	10,00,000	Balance
3	14,00,000	Balance

Current market price per share is ₹ 200.

Slab wise interest rate for fund borrowed is as follows:

Fund limit	Applicable interest rate
Up-to ₹ 5,00,000	10%
Over₹ 5,00,000 and up-to ₹ 10,00,000	15%
Over ₹ 10,00,000	20%

Find out which of the above-mentioned alternatives would you recommend for Raj Ltd. with reference to the EPS, assuming a corporate tax rate is 40%?

Question 3

The following figures are made available to you:

	(₹)
Net profit for the year/EBIT	18,00,000
Interest on secured debentures at 15% p.a.	1,12,500
(debentures were issued 3 months after the commencement of the year)	16,87,500
Income - tax at 35%	
Number of equity shares (₹ 10 each)	1,00,000
Market quotation of equity share	109.70

The company has accumulated revenue reserves of ₹ 12,00,000. The company is examining a project calling for an investment obligation of ₹ 10,00,000 ; this investment is expected to earn the same rate of return as funds already employed.

You are informed that a debt equity ratio (Debt divided by debt plus equity) higher than 60% will cause the price earning ratio to come down by 25%. The interest rate on additional borrowals will cost company 300 basis points more than on their current borrowal on secured debentures.

You are required to advise the company on the probable price of the equity share, if:

(a) the additional investment were to be raised way of loans ; or

(b) the additional investment were to be raised by way of equity.

COST OF CAPITAL

THEORY SECTION

Meaning and Objective

The minimum required rate of return expected by the investors on their investment is the cost of capital. Cost of capital acts as a cut-off rate in selection of long term investment proposals. It is also useful in capital structure decisions. Cost of capital is also known as cut-off rate, overall cost of capital, weighted average cost of capital, hurdle rate, composite cost of capital, WACC, K0, etc.

Scope

In this chapter we will learn

(1) Calculation of Specific cost of Capital

(2) Calculation of Overall cost of Capital

(3) Capital structure theories

* **Specific cost of capital**

(a) Cost of Debt (Kd)

(i) Cost of irredeemable / perpetual debt

$$kd = \frac{\text{Interest}\,(1-\text{tax rate})}{\text{Net Proceeds}} \times 100$$

(ii) Cost of Redeemable Debt

$$kd = \frac{\text{Interest}\,(1-\text{tax rate}) + (RV-NP)/n}{(RV+NP)/2} \times 100$$

Where, RV is the redemption value and NP is the Net Proceeds.

(b) Cost of Preference Shares (Kp)

(i) Cost of irredeemable / perpetual preference shares

$$Kp = \frac{\text{Preference Dividend}}{\text{Net Proceeds}} \times 100$$

(ii) Cost of Redeemable Preference shares

$$Kp = \frac{\text{Preference Dividend} + (RV - NP)/n}{(RV + NP)/2} \times 100$$

Where, RV is the redemption value and NP is the Net Proceeds, DDT is dividend distribution Tax.

(c) Cost of Equity (Ke)

(i) Dividend Yield Approach / Dividend Price Approach

$$Ke\,(existing) = \frac{DPS}{MPS} \times 100 \text{ or } Ke\,(new) \frac{DPS}{\text{Net Proceeds}} \times 100$$

DPS is Expected Dividends per share

MPS is the Market price per share

This approach takes into account the fact that investor is prepared to pay a particular market price taking into account the expected dividend e.g. if the expected dividends are ₹ 5 and the prevailing market price is ₹ 20, then the cost of equity works out to 25%. Under this approach it is presumed that the investors only expects dividends while making the investments i.e. the investors does not aspire for capital appreciation. Secondly, this approach is based on the profits which are expected to be distributed among the shareholders rather than what is available for the investors.

(ii) Earnings Yield Approach/ Earnings Price Approach

$$Ke\,(existing) = \frac{EPS}{MPS} \times 100 \text{ or } Ke\,(new) \frac{EPS}{\text{Net Proceeds}} \times 100$$

EPS is Expected Earnings per share

MPS is the Market price per share

This approach removes the defect of the earlier approach i.e. the cost is calculated with reference to the amount available for Equity shareholders rather than amounts distributed. However, even this approach ignores he growth factor.

(iii) Dividend Yield Approach + Growth Model / Gordon's Formula / Dividend Discount Model / Constant Growth Model

$$Ke\,(existing) = \frac{D1}{P0} \times 100 + g \text{ or } Ke\,(new) \frac{D1}{\text{Net Proceeds}} \times 100 + g$$

Where, D1 is the expected dividend at the end of year 1
P0 is the market price of the share now
G is the growth in dividends

While dividend price approach assumes constant amount of dividend per share year after year. This method assumes dividend per share to change year after year at constant rate. This method is based on the assumption that equity shareholders are not just satisfied with present rate of dividend but they expect an increase in it every year at a constant rate.

This formula is also used to calculate the Fair Value / Equilibrium Price / Justifiable Price / Intrinsic Value / Theoretical Price of the share

$$P0 = \frac{D1}{(Ke - g)} x100$$

Assumptions

- Ke is assumed to be constant
- Growth in dividend is constant
- Ke > g

(iv) Earnings Yield Approach + Growth Model

$$Ke\,(existing) = \frac{E1}{P0} x\,100 + g \;\; or\; Ke\,(new) \frac{E1}{Net\,Proceeds} x \;\; 100$$

Where, E1 is the expected dividend at the end of year 1
P0 is the market price of the share now
G is the growth in earnings

(v) Realised Yield Approach

According to this approach, the cost of equity capital should bedetermined on the basis of return actually realised by the investors in a company on their equity shares. Thus, according to this approach the past records in a given period regarding dividends and the actual capital apprecation in the value of the equity shares held by the shareholders should be taken to compute the cost of equity capital.

This approach gives fairly good results in case of companies with stable dividends and growth records. In case of such companies, it can be assumed with reasonable degree of certainty that the past behaviour will be repeated in the future also.

(vi) Capital Asset Pricing Model (CAPM)

Any rate of return including cost of equity capital is affected by the risk. If an investment is more risky, the investor will demand higher compensation in the form of higher expected returns. The equity shareholders receive dividends after interest has been paid to the debt holders and preference dividend to the preference shareholders. This means their return will be volatile with reference to the change in the company's performance. The cost of equity capital will be higher than that of other sources to reflect this risk.

CAPM classifies the total risk associated with a security / asset into two classes i.e.

(i) the diversifiable risk or unsystematic risk and,

(ii) non-diversifiable risk or systematic risk. The diversifiable risk refers to the risk which can be eliminated by more and more diversification. On the other hand, non-diversifiable risk is that which affects all the firms at a particular point of time and hence cannot be eliminated e.g. risk of political uncertainties, risk of government policies, etc.

An investor can eliminate the diversifiable risk by diversification into more and more securities; however, the non diversifiable risk is the point where investor's attention is required. This non-diversifiable risk of a security is measured in relation to the market portfolio and is denoted by beta coefficient, β. In order to estimate the required rate of return of the equity investors, the risk associated with the shares as represented by β needs to be estimated.

As per CAPM,

$$Ke = Irf + (Rm - Irf)\ \beta$$

Where, Irf is the return from risk free securities

Rm = Return from the market portfolio

β = beta factor

(Rm - Irf) = Market risk premium

β is a measure of the systematic risk of a security.

β is an Index of how sensitive the returns of a security are to the market returns.

β is a measure of how responsive the price of a share is to the market movement.

If β = 1, it means the security exactly copies the market movement i.e. has same risk as the market. If β = 2 it means the share is twice as risky as market. If β = 0.5, it means that security is only half as risky as market i.e. only half of the market movement is reflected in the price of the share.

(d) Cost of retained Earnings (Kr)

Generally, companies do not distribute the entire profits by way of dividends among the shareholders. A part of such profits is retained for future expansion and development. Hence, the equity shareholders block their money with the company in two ways (i) directly by subscribing to the shares and (ii) amount retained by the company. Apparently, retained earnings may appear to carry no cost since they represent funds which have not been raised from outside, but that is not the case. If earnings are not retained they will be distributed in the form of dividends and hence cost of retained earnings must therefore be viewed as the opportunity cost of the forgone dividends to the equity shareholders. Cost of retained earnings is equal to the income what a shareholder could have earned otherwise by investing the same in an alternative investment, if the company would have distributed the earnings by way of dividends instead of retaining it in the business. Therefore every shareholder expects from the company that much of income on the retained earnings for which he is deprived of the income arising on its alternative investment.Since it is very difficult to ascertain the opportunity cost forgone, in absence of information, it is assumed that the equity shareholders expected the same rate of return which they expect on their equity share capital. Hence, if no information is given Kr = Ke.

Note: While computing Kr floatation costs are to be ignored.

* Weighted Average Cost of Capital

Sources	Amount	Weights	Cost in %	W*C
Debt	xxx	xx	xxx	xx
Preference Share Capital	xxx	xx	xxx	xx
Equity Share Capital	xxx	xx	xxx	xx
Retained Earnings	xxx	xx	xxx	xx
				WACC xxx

Types of Weights to ascertain WACC

1. Book Value / Balance Sheet Value weights

In this case, to calculate the WACC Book Values or Balance Sheet Values of each source of finance are considered for ascertaining weights.

2. Market Value weights

In this case, for calculating WACC, Market value of each source of Finance is considered for ascertaining weights. Between Market values and Book values preference is

to be given to Market Value as investors invest always at Market Values and not Book Values. While calculating WACC as per Market Value weights ignore Retained Earnings as the market value of Equity Share Capital includes the Value of Retained earnings.

3. Marginal Value Weights

Whenever we have to calculate WACC for any specific or additional project, Marginal Value Weights are considered. In this case, the proportion of additional funds raised is considered as weights to calculate WACC.

* Capital Structure Theories

General assumptions of Capital structure theories

The relationship between the leverage, cost of capital and the value of the firm has been analysed and examined in different ways. However, the following assumptions have been made to understand this relationship.

(1) There are only two sources of funds i.e.equity and debt, which is having fixed interest. (No preference share capital)

(2) The total assets of the firm are given and there would be no change in the investing decision of the firm (Total assets of the firm remain the same)

(3) The firm has a policy of distributing the entire profits among the shareholders. (100% Payout Ratio)

(4) The operating profits of the firm are given and are expected to remain constant. (EBIT to remain constant)

(5) The Operating or the business risk of the firm is given and assumed to be constant. (Operating Leverage to remain same)

(6) There are no corporate or Personal taxes

(7) Kd is less than Ko

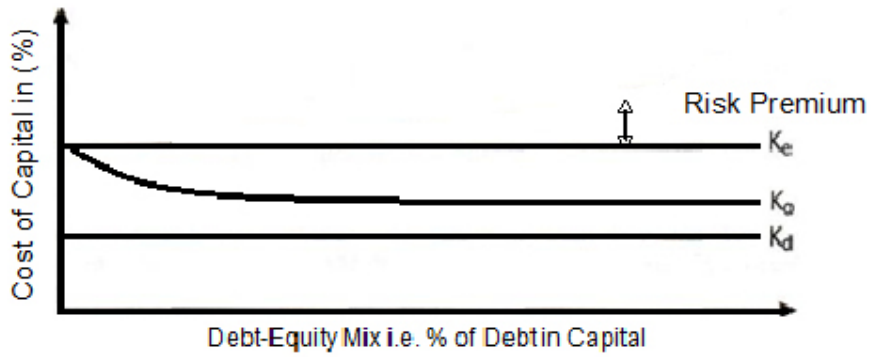
Net Income Approach

This theory was suggested by David Durand. The NI approach to the relationship between Debt-Equity Mix, cost of Capital and Value of the firm is the simplest in approach and explanation. This theory states that there is a relationship between the capital structure and the Ko of the firm. If there will be change in the capital structure, WACC will definitely change.

Apart from the general assumptions the following additional assumptions are made by this theory

- Both Kd and Ke are assumed to remain same irrespective of the debt equity mix i.e. change in the capital structure doesn't affect the risk perception of the investors.

The NI approach start with the argument that change in the financial mix of the firm will lead to change in the WACC and hence it will affect the Overall Value of the firm. As Kd is less than Ke, the increased use of cheaper debt in the overall capital structure will result in magnified returns available to the shareholders. The increased returns to the shareholders will increase the total value of the equity and thus increases the total value of the firm. NI approach suggest that higher the degree of leverage, better it is, as the value of the firm would be higher. In other words, a firm can increase its value just by increasing the debt proportion in the capital structure.



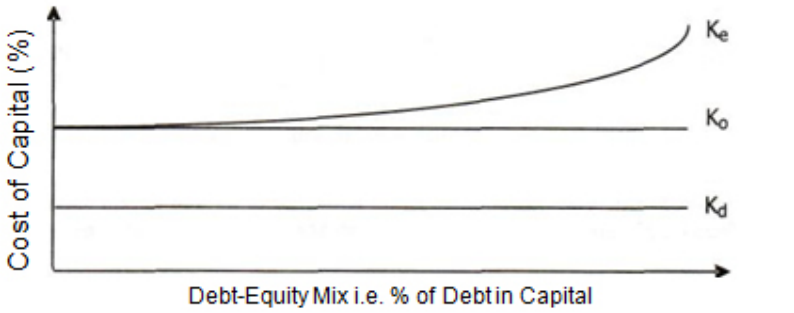
Net Operating Income Approach

The NOI approach is opposite to the NI approach. This is also known as Independent Hypothesis. According to the NOI approach, the market value of the firm depends upon the net operating profit or EBIT and the overall cost of Capital, WACC. The financing mix or the capital structure is irrelevant and does not affect the value of the firm. The NOI approach has made the following assumptions

- The cost of the Debt, Kd, is taken to be constant
- The use of more and more debt in the capital structure increases the risk perception of the shareholders and thus their expectation in the form returns also increases. The increase in Ke is such as to completely offset the benefits of employing the cheaper debt.

As the debt proportion or the financial leverage increases, the risk of the equity shareholders also increases and thus Ke also increases. However, the increase in Ke, is such that the overall all value of the firm remains the same. It may be noted that for

an all equity firm the Ke is just equal to Ko. As the debt proportion increases, Ke also increases. However, the Ko remains constant because increase in Ke is just sufficient to offset the benefits of cheaper debt financing. Under the NOI approach Ko is constant and therefore there is no optimal Capital structure, rather every capital structure is as good as any other and every capital structure is optimum.



Traditional Approach

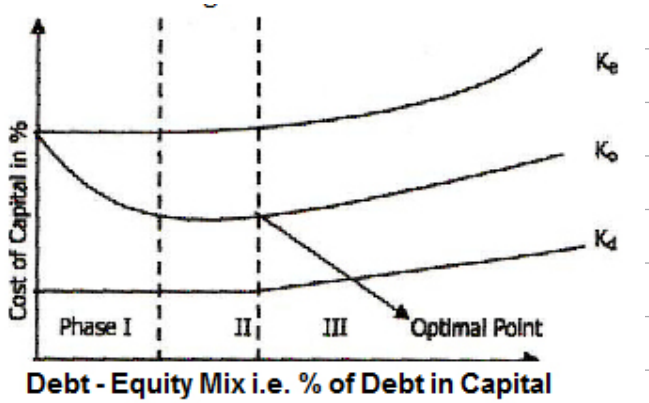
Traditional Approach is a practical viewpoint. The NI and the NOI approach hold extreme views on the relationship between the Debt Equity Mix, cost of capital and Value of the Firm. In practical situation, both these approaches seem to be unrealistic.

As per Traditional Approach the firm should make a judicious use of both the debt and the equity to achieve a capital structure which may be called the optimal capital structure. At this capital structure, the overall cost of capital, WACC, of the firm will be minimum and the value of the firm will be maximum.

The traditional view states that the value of the firm increases with increase in the Debt Equity mix but up to a certain limit only. Beyond this limit, the increase in the financial leverage will increase its WACC also, and the value of the firm will decrease.

When (cheaper) debt is introduced in the capital structure and the financial leverage increases, the Ke remains the same as the equity investors expect a minimum leverage in every firm. The Ke, doesn't increases even with the increase in the debt proportion. The argument for Ke, remaining unchanged may be that up to a particular degree of leverage, the interest charge may not be large enough to pose a real threat to the dividend payable to the shareholders. This constant Kd and Ke will make the Ko fall. Thus, it shows that the benefits of cheaper debts are available to the firm. This position doesn't continue when leverage in future increases.

The increase in leverage beyond the limit increases the risk perception of the equity investors also and as a result the Ke, starts increasing. However, the benefits of use of Debt in the capital structure will be so large, that even after off- setting the effects of increased Ke, the Ko may still go down or may become constant for some degree of FL. If the firm increases the FL further then the risk perception of the Debt investor will also increase. The already rising Ke and now increase in the Kd will result into increase of Ko. Therefore, the use of leverage beyond a point will have the effect of increase in the overall cost of Capital of the firm resulting into decrease in the value of the firm.



Modigliani Miller Approach

MM have favoured the NOI approach i.e. the Value of the firm remains the same, irrespective of the Capital structure. There is nothing known as Optimum Capital Structure and for any Debt equity Mix the Ko remains the same and hence the value of the firm remains the same. This point they have proved with the help of a behavioural process known as arbitrage process.

MM model argues that, if two firms are alike in all aspect expect in their capital structure and Market Value, then the investors will develop a tendency to sell the shares of the overvalued firm (creating a selling pressure) and to buy the shares of the undervalued firm (creating buying pressure). This, buying and selling will continue till the two firms have same market value.

So as per MM, when two companies are identical, there exist a value known as equilibrium value and Ko known as equilibrium Ko.

Therefore, as per MM, if there are no taxes

Value of Levered Co. = Value of Unlevered Co.

MM model, if there are corporate taxes

Value of Levered Co. = Value of Unlevered Co. + Debt x tax rate.

The MM model works under the following set of assumptions

(1) There are 2 sources of finance – Debt and Equity.

(2) No corporate and personal taxes (later on this assumption was relaxed).

(3) Investors have all the full knowledge of the over valuation and under valuation of the firm.

(4) The Loan is available to the investors at the same rate of interest at which it is available to the company.

(5) Investors are rational wanting to earn arbitrage profits.

(6) There are no frictions in trading i.e. no transaction costs.

CLASSWORK SECTION

Question 1

Masco Limited wishes to raise additional finance of ₹ 10 lakhs for meeting its investment plans. It has ₹ 2,10,000 in the form of retained earnings available for investment purposes. Further details are as following:

(1)	Debt / equity mix	30%/70%
(2)	Cost of debt	
	Upto ₹ 1,80,000	10% (before tax)
	Beyond ₹ 1,80,000	16% (before tax)
(3)	Earnings per share	₹ 4
(4)	Dividend pay out	50% of earnings
(5)	Expected growth rate in dividend	10%
(6)	Current market price per share	₹ 44
(7)	Tax rate	50%

You are required:

(a) To determine the pattern for raising the additional finance.

(b) To determine the post-tax average cost of additional debt.

(c) To determine the cost of retained earnings and cost of equity, and

(d) Compute the overall weighted average after tax cost of additional finance.

(e) Also Calculate the maximum capital expenditure that can be inurred without fresh issue of equity chares.

Question 2

ABC Ltd. has the following capital structure which is considered to be optimum as on 31st March, 2017.

	(₹)
14% Debentures	30,000
11% Preference shares	10,000
Equity Shares (10,000 shares)	1,60,000
	2,00,000

The company share has a market price of ₹ 23.60. Next year dividend per share is 50% of year 2017 EPS. The following is the trend of EPS for the preceding 10 years which is expected to continue in future.

Year	EPS (₹)	Year	EPS (₹)

2008	1.00	2013	1.61
2009	1.10	2014	1.77
2010	1.21	2015	1.95
2011	1.33	2016	2.15
2012	1.46	2017	2.36

The company issued new debentures carrying 16% rate of interest and the current market price of debenture is ₹ 96.

Preference share ₹ 9.20 (with annual dividend of ₹ 1.1 per share) were also issued. The company is in 50% tax bracket.

(A) Calculate after tax:

(i) Cost of new debt

(ii) Cost of new preference shares

(iii) New equity share (assuming new equity from retained earnings)

(B) Calculate marginal cost of capital when no new shares are issued.

(C) How much can be spent for capital investment before new ordinary shares must be sold. Assuming that retained earnings for next year's investment are 50 percent of 2017. Earnings.

(D) What will the marginal cost of capital when the funds exceeds the amount calculated in (C), assuming new equity is issued at ₹ 20 per share?

Question 3

Assuming the corporate tax rate of 35 per cent, compute the after tax cost of capital in the following situations:

(i) Perpetual 15% Debentures of ₹ 1.000, sold at a premium of 10 per cent with no flotation costs.

(ii) 10 year 14% Debentures of ₹ 2.000, redeemable at par and issued with 5 percent flotation costs.

(iii) 10 year 14% Preference shares of ₹ 100, redeemable at premium of 5 per cent and issued with 5 per cent flotation costs. Dividend tax is 10 per cent.

(iv) An equity share selling at ₹ 50 and paying a dividend of ₹6 per share, which is expected to continue indefinitely.

(v) An equity share is selling at ₹ 120 per share. The expected EPS is ₹ 20 of which 50% is paid in dividends. The shareholders expect the company to earn a constant after tax rate of 10 per cent on its investments of retained earnings.

Question 4

Calculate the WACC using the following data by using:

(a) Market value weights

The capital structure of the company is as under:

	(₹)
Debentures (₹ 100 per debenture)	5,00,000
Preference shares (₹100 per share)	5,00,000
Equity shares (₹ 10 per share)	10,00,000
	20,00,000

The market prices of these securities are:

Debentures ₹ 105 per debenture

Preference shares ₹ 110 per preference share

Equity shares ₹ 24 each.

Additional information:

(1) ₹ 100 per debenture redeemable at par, 10% coupon rate, 4% floatation costs, 10 year maturity.

(2) ₹ 100 per preference share redeemable at par, 5% coupon rate, 2% floatation cost and 10 year maturity.

(3) Equity shares has ₹ 4 floatation cost and market price ₹ 24 per share. The next year expected dividend is ₹ 1 with annual growth of 5%. The firm has practice of paying all earnings in the form of dividend.

Corporate tax rate is 50%.

Question 5

Determine the Cost of Capital using the Book Value (BV) Ifrom the following information -

Particulars	Book Value (inRs.)
Equity Shares	1,20,00,000
Retained Earnings	30,00,000
Preference Shares	9,00,000
Debentures	36,00,000

Additional. Information:

1. Equity: Equity Shares are quoted at Rs. 130 per Share and a New Issue priced at Rs. 125 per Share will be fully subscribed, Floatation Costs will be Rs. 5 per Share.
2 Dividend: During the previous 4 years, Dividends have steadily increased from Rs. 10.60 to Rs. 14.19 per Share. Dividend at the end of the Current year is expected to be Rs. 15 per Share.
3. Preference Shares: 15% Preference Shares with Face Value of Rs. 100 would realize Rs. 105 per Share.
4. Debentures: The Company proposes to issue 11-year 15% Debentures but the yield on Debentures of similar maturity and risk class is 16%, Floatation Cost is 2% of face value.
5. Tax: Corporate Tax Rate is 35%. Ignore Dividend Tax.

ESTIMATION OF WORKING CAPITAL

THEORY SECTION

Meaning and Objective

Capital is nothing but money required to start or run the business. How much to raise money depends on, how much we are planning to invest. Invest where? Invest in Fixed Assets and Working Capital. Fixed Assets cannot work on its own until and unless adequate level of working capital is maintained. This extra capital that we need for smooth working of our fixed assets is known as working capital.

Objective

This chapter will give us the answer to the following question,
"How much money should we raise to meet our working capital requirement"?
The level of working capital depends on the level of Current Assets and the level of Current Liabilities. The level of Current assets in turn depends upon the level of Stock (Stock of Raw Material, WIP, Finished Goods), Debtors and Cash Bank, whereas the level of Current liabilities is dependent on the level of Creditors and Outstanding expenses. So if we can fairly estimate the level of these individual components of current assets and the current liabilities we can very well estimate our Working Capital Requirement.

Scope

In this chapter we will learn

(a) How to estimate our working capital requirement
(b) Working Capital Operating Cycle
(c) How to finance the Working Capital requirement
* How to estimate our working Capital requirement

There are two approaches for estimating our working capital requirement

(1) Total Basis: Under this approach all the expenses and profit margins are considered for estimating our working capital needs.

(2) Cash Cost Basis: Under this approach only cash expenses are considered for estimating our working capital needs

Rates of Valuation of various items –

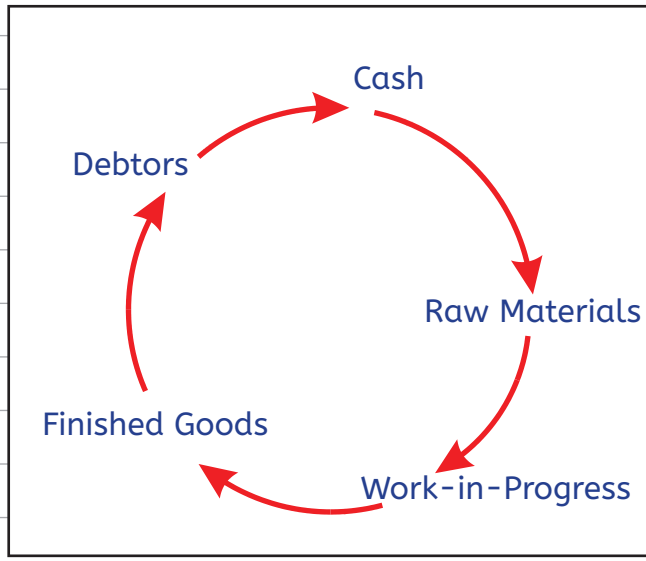
Component	Total Approach	Cash Cost Approach
Raw Materials	Purchase Price net of discounts	Purchase Price net of discounts
Work-in-Progress	Raw Materials+50% of [Direct Labour +Direct Expenses +All Production OH]	Raw Materials + 50% of [Direct Labour + Direct Expenses + Production OH excluding Depreciation]
Finished Goods	Cost of Production	Cost of Production Less Depreciation
Sundry Debtors	Selling Price	Selling Price Less Profit Margin Less Depreciation
Sundry Creditors	Purchase Price net of discounts	Purchase Price net of discounts

Note: For WIP valuation, it is assumed that materials are fully issued and conversion (i.e. Labour and Production OH) is half - complete.

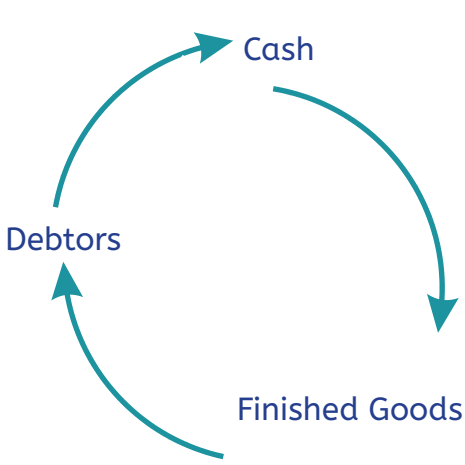
* **Working Capital Operating Cycle**

The process of conversion of cash back into cash is known as Working Capital Operating Cycle i.e. the process of cash which is used for purchasing Raw materials to again get converted back into cash as realisation from Debtors is known as Working Capital Operating Cycle and the time taken for this conversion of cash back into cash is known as duration of Operating Cycle.

CASH CYCLE OF MANUFACTURING FIRM



CASH CYCLE OF TRADING FIRM



Duration of the Working Capital Operating Cycle is calculated in the following manner

Raw material holding period	xx
WIP conversion period	xx
Finished Goods Holding period	xx
Debtors Collection Period	xx
Gross Duration	xx
Less: Creditors Payment period	xx
Net Duration	xx

$$\text{Raw Material Holding Period} = \frac{\text{Average Stock of Raw Material}}{\text{Raw Material Consumed}} \times 365/52/12$$

$$\text{RWIP Conversion Period} = \frac{\text{Average Stock of WIP}}{\text{COP}} \times 365/52/12$$

$$\text{Finished Goods Holding Period} = \frac{\text{Average Stock of Finished Goods}}{\text{COGS}} \times 365/52/12$$

$$\text{Debtors Collection Period} = \frac{\text{Average Debtors}}{\text{Credit Sales}} \times 365/52/12$$

$$\text{Creditors Payment Period} = \frac{\text{Average Creditors}}{\text{Credit Purchases}} \times 365/52/12$$

* **Financing of Working Capital**

Working Capital can be classified based on (a) Concept or (b) Time Factor, as under -

Classification of Working Capital

Based on Concept

Gross Working Capital

Current Assets only.

Net Working Capital

Current Assets Less Current Liabilities.

Based on Time Factor

Permanent Working Capital

* It is the minimum level of investment required in the WC of the business at any point of time and hence at all points of time.
* It is also called Fixed or Hard Core Working Capital.

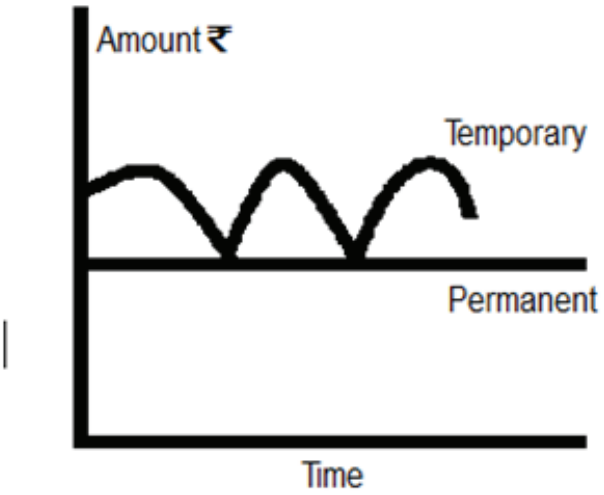
Temporary Working Capital

* It represents Working Capital requirements over and above Permanent Working Capital and is dependent on factors like peak season, trade cycle boom, etc.
* It is also called Fluctuating or Variable Working Capital.

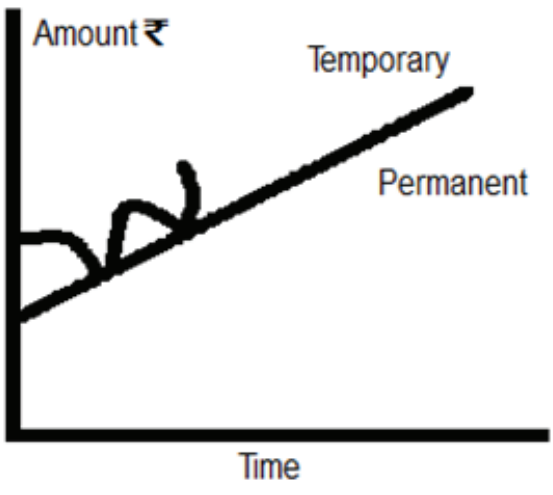
There are two views as to the amount of Permanent Working Capital –

PERMANENT WORKING CAPITAL

REMAINING CONSTANT AT ALL TIMES



INCREASING ALONG WITH TIME



Approaches to Finance the working Capital

Hedging Approach

Hedging approach is also known as matching approach. It is based upon concept of bifurcation of total working capital needs into permanent and temporary working capital. Under this approach, the permanent working capital needs are financed by long term sources and the temporary working capital requirement from short term sources.

Conservative Approach

As the name suggests, under this approach finance manager doesn't undertake risk. As a result, all the working capital needs are financed by long term source and the use of short term sources may be restricted to unexpected and emergency situations only.

Aggressive Approach

A working capital policy is also called as aggressive policy if the firm decides to finance a part of the permanent working capital by short term sources. So, the short term financing under aggressive policy is more than hedging approach.

CLASSWORK SECTION

Question 1

The following annual figures relate to XYZ Co.

	₹
Sales (at two months' credit)	36,00,000
Materials consumed (Suppliers extend two months' credit)	9,00,000
Wages (paid monthly in arrears)	7,20,000
Manufacturing expenses outstanding at the end of the year (Cash expenses are paid one month in arrears)	80,000
Total administrative expenses, paid as above	2,40,000
Total Sales promotion expenses, paid quarterly in advance	1,20,000

The company sells its products on gross profit of 25% counting depreciation as part of the cost of production. It keeps one month's stock each of raw materials and finished goods, and a cash balance of ₹ 1,00,000.

Assuming a 20% safety margin, work out the working capital requirements of the company on cash cost basis. Ignore work-in-process.

Question 2

MA LIMITED is commencing a new project for manufacture of a plastic component. The following cost information has been ascertained for annual production of 12,000 units which is the full capacity :

	Cost per unit ₹
Materials	40
Direct Labour and variable expenses	20
Fixed Manufacturing expenses	6
Depreciation	10
Fixed Administration expenses	4
	₹ 80

The selling price per unit is expected to be ₹ 96 and the selling expenses ₹ 5 per unit, 80% of which is variable.

In the first two years of operations, production and sales are expected to be as follows:

Year	Production no. of units	Sales no. of units
1	6,000	5,000
2	9,000	8,500

To assess the working capital requirements, the following additional informations is available:

a)	Stock of materials	2.25 months' average consumption
b)	Work in process	Nil
c)	Debtors	1 month's average sales
d)	Cash balance	₹ 10,000
e)	Creditors for supply of materials :	1 month's average purchases during the year
f)	Creditors for expenses:	1 month's average of all expenses during the year

Prepare, for the two years,

(i) A projected statement of Profit / Loss (ignoring taxation); and

(ii) A projected statement of working capital requirements on total basis.

Question 3

Samreen Enterprises has been operating its manufacturing facilities till 31.3.2017 on a single shift working with the following cost structure:

	Per unit (₹)
Cost of Materials	6.00
Wages (out of which 40% fixed)	5.00
Overheads (out of which 80% fixed)	5.00
Profit	2.00
Selling Price	18.00
Sales during 2016 – 2017 - ₹ 4, 32,000.	

As at 31.3.2017 the company held:

	(₹)
Stock of raw materials (at cost)	36,000
Work-in-progress (valued at prime cost)	22,000
Finished goods (valued at total cost)	72,000
Sundry debtors	1,08,000

In view of increased market demand, it is proposed to double production by working an extra shift. It is expected that a 10% discount will be available from suppliers of raw materials in view of increased volume of business. Selling price will remain the same. The credit period allowed to customers will remain unaltered. Credit availed of from suppliers will continue to remain at the present level i.e., 2 months. Lag in payment of wages and expenses will continue to remain half a month.

You are required to assess the additional working capital requirements, if the policy to increase output is implemented.

Question 4

The following information is provided by the DPS Limited for the year ending 31st March, 2020.

Raw material storage period	55 days
Work-in-progress conversion period	18 days
Finished Goods storage period	22 days
Debt collection period	45 days
Creditors' payment period	60 days
Annual Operating cost	₹ 21, 00,000
(Including depreciation of ₹ 2, 10,000)	

[1 year = 360 days]

You are required to calculate:

(i) Operating Cycle period.

(ii) Number of Operating Cycle in a year.

(iii) Amount of working capital required for the company on a cash cost basis.

(iv) The company is a market leader in its product, there is virtually no competitor in the market. Based on a market research it is planning to discontinue sales on credit and deliver products based on pre-payments. Thereby, it can reduce its working capital requirement substantially.

What would be the reduction in working capital requirement due to such decision?

Question 5

Aneja Limited, a newly formed company, has applied to the commercial bank for the first time for financing its working capital requirements. The following information is available about the projections for the current year :

Estimated level of activity : 1,04,000 completed units of production plus 4,000 units of work-in-progress. Based on the above activity, estimated cost per unit is:

Raw Material	₹ 80 per unit
Direct Wages	₹ 30 per unit
Overheads	₹ 60 per unit
Total Cost	₹ 170 per unit
Selling Price	₹ 200 per unit

Raw materials in stock : Average 4 weeks consumption, work-in-progress (assume 50% completion stage in respect of conversion cost) (materials issued at the start of the processing).

Finished goods in stock	8,000 units
Credit allowed by suppliers	Average 4 weeks
Credit allowed to debtors / receivables	Average 8 weeks
Lag in payment of wages	Average 1.5 weeks

Cash at banks (for smooth operation) is expected to be ₹ 25,000.

Assume that production is carried on evenly throughout the year (52 weeks) and wages and overheads accrue similarly. All sales are on credit basis only.

You are required to calculate the net working capital required.

Question 6

Kalyan limited has provided you the following information for the year 2021-22:

By working at 60% of its capacity the company was able to generate sales of ₹ 72,00,000. Direct labour cost per unit amounted to ₹ 20 per unit. Direct material cost per unit was 40% of the selling price per unit. Selling price was 3 times the direct labour cost per unit. Profit margin was 25% on the total cost.

For the year 2022-23, the company makes the following estimates:

Production and sales will increase to 90% of its capacity. Raw material per unit price will remain unchanged. Direct expense per unit will increase by 50%. Direct labour per unit will increase by 10%. Despite the fluctuations in the cost structure, the company wants to maintain the same profit margin on sales.

Raw materials will be in stock for one month whereas finished goods will remain in stock for two months. Production cycle is for 2 months. Credit period allowed by suppliers is 2 months. Sales are made to three zones:

Zone	Percentage of sale	Mode of Credit
A	50%	Credit period of 2 months
B	30%	Credit period of 3 months
C	20%	Cash Sales

There are no cash purchases and cash balance will be ₹ 1,11,000

The company plans to apply for a working capital financing from bank for the year 2022 -23. ESTIMATE Net Working Capital of the Company receivables to be taken on sales and also COMPUTE the maximum permissible bank finance for the company using 3 criteria of Tandon Committee Norms. (Assume stock of finished goods to be a core current asset).

RECEIVABLES MANAGEMENT

THEORY SECTION

Meaning

Sales department would like to grant more & more credit in an effort to increase the sales. It is the finance manager who has to decide whether the credit period should be extended. A credit policy decision is a "trade - off" between profit on additional sales & cost of carrying debtors. Cost of carrying debtors (COCD) means minimum return required on investment in debtors. A credit policy decision may be general or customer specific.

Scope

The three basic aspects of management of Sundry Debtors will be studied in this Chapter.

1. Credit Policy : decisions on credit period to be allowed, early payment discount rates, etc.
2. Credit Analysis : decisions on whether credit can be extended to a particular customer.
3. Factoring : decision on whether services of factor should be taken or not.

CLASSWORK SECTION

Question 1

A company currently has an annual turnover of ₹ 10 lakhs and an average collection period of 45 days. The company wants to experiment with a more liberal credit policy on the ground that increase in collection period will generate additional sales. From the following information, kindly indicate which of the policies you would like the company to adopt:

Credit Policy	Increase in collection period	Increase in Sales (₹)	Percentage of default
1	15 days	50,000	2%
2	30 days	80,000	3%

The selling price of the product is ₹ 5, average costs per unit at current level is ₹ 4 and the variable costs per unit is ₹ 3.

The current bad debt loss is 1% and the required rate of return on investment is 20%. A year can be taken to comprise of 360 days.

Question 2

PTX Limited is considering a change in its present credit policy. Currently it is evaluating two policies. The company is required to give a return of 20% on the investment in new accounts receivables. The company's variable costs are 70% of the selling price. Information regarding present and proposed policies is as follows:

	Present Policy	Policy Option 1	Policy Option 2
Annual Credit Sales (₹)	30,00,000	42,00,000	45,00,000
Debtors turnover ratio	4 times	3 times	2.4 times
Loss due to bad debts	3% of sales	5% of sales	6% of sales

Note: Return on investment in new accounts receivable is based on cost of investment in debtors.

Which option would you recommend?

Question 3

A company is presently having credit sales of ₹ 12 lakh. The existing credit terms are 1/10, net 45 days and average collection period is 30 days. The current bad debts loss is 1.5%. In order to accelerate the collection process further as also to increase sales, the company is contemplating liberalization of its existing credit terms to 2/10, net 45 days. It is expected that sales are likely to increase by 1/3 of existing sales, bad debts increase to 2% of sales and average collection period to decline to 20 days. The contribution to sales ratio of the company is 22% and opportunity cost of investment in receivables is 15 percent (pre-tax). 50 per cent and 80 percent of customers in terms of sales revenue are expected to avail cash discount under existing and liberalization scheme respectively. The tax rate is 30%. Should the company change its credit terms?

(Assume 360 days in a year).

Question 4

A company is considering using a factor; the following information is relevant

(a) The current average collection period for the company's debt is 80 days and 0.5% of the debtors default. The factor has agreed to pay within 60 days and will suffer the loss of any bad debts.

(b) The annual charges for the factoring is 2% which is payable annually at the end of the year. Administrative cost savings will amount to ₹ 1,00,000/- p.a.

(c) Annual Sales all are on credit are ₹ 1,00,00,000/-. Variable cost is 80% of sales. The company's cost of capital is 15% p.a.

Should the company enter into factoring agreement?

Question 5

A firm has credit sales of ₹ 360 lakhs and its average collection period is 30 days. The financial controller estimates, bad debt losses are around 2% of credit sales. The firm spends ₹ 1,40,000 annually on debtors administration. This cost comprises of telephonic and fax bills along with salaries of staff members. These are the avoidable costs. A Factoring firm has offered to buy the firm's receivables. The factor will charge 1% commission and will pay an advance against receivables on an interest @15% p.a. after withholding 10% as reserve. What should the firm do? Assume 360 days in a year.

Question 6

Tony Limited, manufacturer of Colour TV sets is considering the liberalization of existing credit terms to three of their large customers A, B and C. The credit period and likely quantity of TV sets that will be sold to the customers in addition to other sales are a follows:

Quantity sold (No. of TV Sets)

Credit Period (Days)	A	B	C
0	1,000	1,000	-
30	1,000	1,500	-
60	1,000	2,000	1,000
90	1,000	2,500	1,500

The selling price per TV set is Rs. 9,000. The expected contribution is 20% of the selling price. The cost of carrying receivable averages 20%per annum.

You are required:

(a) COMPUTE the credit period to be allowed to each customer. (Assume360daysinayearforcalculationpurposes).

(b) DEMONSTRATE the other problems the company might face in allowing the credit period as determined in (a)above?

CAPITAL STRUCTURE THEORIES

CLASSWORK SECTION

Question 1

ABC, Ltd., is expecting an annual Earnings before the payment of Interest and Tax of ₹ 2 lacs. The company in its capital structure has ₹ 8 lacs in 10% debentures. The cost of equity or capitalisation rate is 12.5%. You are required to calculate the value of firm according to NI Approach. Also compute the overall cost of capital. If the firm borrows another ₹ 2,00,000. Calculate the Revised value and cost of capital of the company.

Question 2

ABC Ltd., is expecting an Earning before interest & tax of ₹ 4,00,000 and belongs to risk class of 10%. You are required to find out the value of firm & cost of equity capital if it employs 8% debt to the extent of 20%, 35% or 50% of the total financial requirement of ₹ 20,00,000.

Use NOI approach.

Question 3

RES Ltd. is an all equity financed company with a market value of ₹ 25,00,000 and cost of equity, ke = 21%. The company wants to buyback equity shares worth ₹ 5,00,000 by issuing and raising 15% perpetual debt of the same amount. Rate of tax may be taken as 30%. After the capital restructuring and applying MM Model (with taxes), you are required to calculate:

(i) Market value of RES Ltd.

(ii) Cost of Equity ke

(iii) Weighted average cost of capital and comment on it.

Question 4

There are two company N Ltd. and M Ltd., having same earnings before interest and taxes i.e. EBIT of ₹ 20,000. M Ltd. is a levered company having a debt of ₹ 1,00,000 @ 7% rate of interest. The cost of equity of N Ltd. is 10% and of M Ltd. is 11.50%. Find out how arbitrage process will be carried on?

Question 5

Leo Ltd. has a net operating income of ₹21,60,000 and the total capitalisation of ₹120 lakhs. The company is evaluating the options to introduce debt financing in the capital structure and the following information is available at various levels of debt value.

Debt Value (₹)	Interest rate (%)	Equity Capitalisation rate (%)
0	N.A.	12.00
10,00,000	7.00	12.50
20,00,000	7.00	13.00
30,00,000	7.50	13.50
40,00,000	7.50	14.00
50,00,000	8.00	15.00
60,00,000	8.50	16.00
70,00,000	9.00	17.00
80,00,000	10.00	20.00

You are required to COMPUTE the equity capitalization rate if MM approach is followed. Assume that the operates in zero tax regime and calculations to be based on book values.

CAPITAL BUDGETING

THEORY SECTION

Meaning and Objective

Decisions relating to long term assets / capital assets / fixed assets / long term projects are known as Capital Budgeting decisions. For e.g. setting up a new branch, purchase of machinery, manufacturing a new product, etc. The unique part of these decisions is that the outflows associated with the project are immediate and the inflows are spread over a number of years. Most of the capital budgeting decisions are irreversible decisions involving huge cash outflows. Once taken, the firm may not be able to revert back unless it is ready to absorb heavy losses. Therefore, the capital budgeting decisions should be taken only after considering and evaluating each and every minute detail of the project else the financial consequences will have far reaching effects.

This chapter revolves around two things, comparing the cash outflows to that of the cash inflows. Cash outflows will always be given in the question for that matter even cash inflows will be given, if not then the same can be calculated as follows:

Sales		xx
Less:	Variable Cost	xx
	Fixed Cost	xx
	Cash flow before tax (CFBT / NPBDT)	xx
Less:	Depreciation	XX
	Net Profit before tax (NPBT)	xx
Less:	Tax	xx
	Net Profit after tax (NPAT)	xx
Add:	Depreciation	xx
	Cash Flows after tax (CFAT / CI)	xx

Scope

This chapter will teach us various methods for evaluating long term proposal.

Methods for evaluation

(a) Pay Back Period Approach (PBP)
(b) Net Present Value (NPV)
(c) Profitability Index (PI)
(d) Internal Rate of Return (IRR)
(e) Discounted Payback period (Discounted PBP)
(f) Average / Accounting Rate of Return (ARR)
(g) Modified IRR

Pay back period

The length of time taken to recover the original investment is the pay back period. For e.g. if the project requires a cash outflow of ₹10 Lacs which gets recovered say within 4 years then the payback period is 4 years.

Decision Rule:

Select that project whose payback period is less.

Limitations:

(a) It ignores Time Value of Money
(b) Post Payback period cash inflows are completely ignored i.e. all cash inflows are not considered.

Net Present Value

This method takes into consideration all the cash inflows related to the project and also incorporates the concept of time value of money.

NPV = PVCI − PVCO

In this method, all the related cash flows associated with the project are discounted and are bought to its present value by using a discounting factor rate which is the cost of capital or minimum required rate for the company.

Decision Rule:

(a) If there is only one project and it is to be decided whether it should be selected or not then the criterion is very simple. Accept the project if it has a positive NPV, Reject if the NPV is negative and if NPV is zero then we are indifferent.
(b) If the management has to select between two mutually exclusive projects, then the project with highest NPV is to be selected.

Profitability Index or Desirability Factor or cost benefit ratio

$$PI = \frac{PVCI\ (at\ coc)}{PVCO}$$

It is an extended version of NPV. It indicates that against every 1 rupee of outflow how much cash inflow the project generates in present value terms. PI technique is useful in capital rationing situation (money is in short supply).

Decision Rule:

(a) If PI > 1, select the project.

(b) If P < 1, reject the project.

(c) If PI = 1 , indifferent.

Internal Rate of Return

IRR is the rate which the project is expected to earn for the Co. Mathematically IRR is the discount rate which will equate the present value of the cash inflows with the present value of cash outflows, i.e. at IRR, PVCI – PVCO = 0.

Decision Rule:

(a) If IRR > Cost of Capital, accept the project.

(b) If IRR < Cost of Capital, reject the project.

(c) If IRR = Cost of Capital, indifferent.

Discounted Payback Period

Payback period has 2 limitations; time value of money is ignored and post pay back profitability is ignored. Discounted Payback period is an attempt to remove one such limitation. When time value is introduced to the payback period, it is known as Discounted Payback period.

Average Rate of Return / Accounting Rate of Return

$$ARR = \frac{Average\ Profit\ after\ tax}{Original\ Investment} \times 100$$

OR

$$ARR = \frac{Average\ Profit\ after\ tax}{Average\ Investment} \times 100$$

$$Where\ average\ investment\ is = \frac{Original\ investment + scrap\ value}{2}$$

It shows book profitability of the project. It indicaes Average NPAT earned by the project during its life time.

Limitations

(a) Ignores time value of money.

(b) Based on accounting profit and not on cash profit.

MODIFIED IRR

MIRR is superior to the regular IRR, MIRR assumes that project cash flows are reinvested at a certain re-investment rate, whereas the regular IRR assumes that project cash flows are reinvested at the project's own IRR. Since reinvestment at cost of capital is more realistic than reinvestment at IRR, MIRR reflects better the true profit-ability of a project.

CLASSWORK SECTION

Question 1

ABC Ltd is a small company that is currently analyzing capital expenditure proposals for the purchase of equipment; the company uses the net present value technique to evaluate projects. The capital budget is limited to ₹ 500,000 which ABC Ltd believes is the maximum capital it can raise. The initial investment and projected net cash flows for each project are shown below. The cost of capital of ABC Ltd is 12%. You are required to compute the NPV of the different projects.

	Project A	Project B
Initial Investment	200,000	1,90,000
Project Cash Inflows		
Year 1	50,000	40,000
2	50,000	50,000
3	50,000	70,000
4	50,000	75,000
5	50,000	75,000

Qustion 2

Shiva Limited is planning its capital investment programme for next year. It has five projects all of which give a positive NPV at the company cut-off rate of 15 percent, the investment outflows and present values being as follows:

Project	Investment	NPV@15%
	₹'000	₹'000
A	(50)	15.4
B	(40)	18.7
C	(25)	10.1
D	(30)	11.2
E	(35)	19.3

The company is limited to a capital spending of ₹ 1, 20,000.

You are required to optimise the returns from a package of projects within the capital spending limit. The projects are independent of each other and are divisible (i.e., part-project is possible).

Also select the projects if they are indivisible.

Question 3

An investment of ₹ 1,36,000 yields the following cash inflows (profits before depreciation but after tax). Determine MIRR considering 8% as cost of capital.

Years	Profit after tax and depreciation (₹)
1	30,000
2	40,000
3	60,000
4	30,000
5	20,000
	1,80,000

Question 4

A Company is considering a proposal of installing a drying equipment. The equipment would involve a Cash outlay of ₹ 6,00,000 and net Working Capital of ₹ 80,000. The expected life of the project is 5 years without any salvage value. Assume that the company is allowed to charge depreciation on straight-line basis for Income-tax purpose.

The estimated before-tax cash inflows are given below:

Year	Before tax cash inflows (in '000)				
	1	2	3	4	5
	240	275	210	180	160

The applicable Income-tax rate to the Company is 35%. If the Company's opportunity Cost of Capital is 12%, calculate the equipment's discounted payback period, payback period, net present value and internal rate of return.

The PV factors at 12%, 14% and 15% are:

Year	1	2	3	4	5
PV factor at 12%	0.8929	0.7972	0.7118	0.6355	0.5674
PV factor at 14%	0.8772	0.7695	0.6750	0.5921	0.5194
PV factor at 15%	0.8696	0.75610	0.6575	0.5718	0.4972

Question 5

An existing company has a machine which has been in operation for two years, its estimated remaining useful life is 4 years with no residual value in the end. Its current market value is ₹ 3 lakhs. The management is considering a proposal to purchase an improved model of a machine gives increase output. The details are as under:

Particulars	Existing Machine	New Machine
Purchase Price	₹ 6,00,000	₹ 10,00,000
Estimated Life	6 years	4 years
Residual Value	0	0
Annual Operating days	300	300
Operating hours per day	6	6
Selling price per unit	₹ 10	₹ 10
Material cost per unit	₹ 2	₹ 2
Output per hour in units	20	40
Labour cost per hour	₹ 20	₹ 30
Fixed overhead per annum excluding depreciation	₹ 1,00,000	₹ 60,000
Working Capital	₹ 1,00,000	₹ 2,00,000
Income-tax rate	30%	30%

Assuming that - cost of capital is 10% and the company uses written down value of depreciation @ 20% and it has several machines in 20% block.

Advice the management on the Replacement of Machine as per the NPV method. The discounting factors table given below:

Discounting Factors	Year 1	Year 2	Year 3	Year 4
10%	0.909	0.826	0.751	0.683

Question 6

XYZ Ltd. is planning to introduce a new product with a project life of 8 years. Initial equipment cost will be ₹ 1.75 crores. Additional equipment costing ₹ 12,50,000 will be purchased at the end of the third year from the cash inflow of this year. At the end of 8 years, the original equipment will have no resale value, but additional equipment can be sold for ₹ 1,25,000. A working capital of ₹ 20,00,000 will be needed and it will be released at the end of eighth year. The project will be financed with sufficient amount of equity capital.

The sales volumes over eight years have been estimated as follows:

Year	1	2	3	4-5	6-8
Units	72,000	1,08,000	2,60,000	2,70,000	1,80,000

A sales price of ₹ 120 per unit is expected and variable expenses will amount to 60% of sales revenue. Fixed cash operating costs will amount ₹ 18,00,000 per year. The loss of any year will be set off from the profits of subsequent two years. The company is subject to 30 per cent tax rate and considers 12 per cent to be an appropriate after tax cost of capital for this project.

The company follows straight line method of depreciation.

Required:

Calculate the net present value of the project and advise the management to take appropriate decision.

Note:

The PV factors at 12% are

Year	1	2	3	4	5	6	7	8
Units	.893	.797	.712	.636	.567	.507	.452	.404

Question 7

XYZ Ltd. has decided to diversify its production and wants to invest its surplus funds on the most profitable project. It has under consideration only two projects - "A" and "B" The cost of project "A" is ₹ 100 lakhs and that of "B" is ₹ 150 lakhs. Both projects are expected to have a life of 8 years only and at the end of this period "A" will have a salvage value of ₹4 lakhs and "B" ₹ 14 lakhs. The running expenses of "A" will be ₹ 35 lakhs per year and that of "B" ₹ 20 lakhs per year. In either case the company expects a rate of return of 10%. The company's tax rate is 40%. Depreciation is charged on straight line basis. Which project should the company take up?

Note : Present value of annuity of Re.1 for eight years at 10% is 5.335 and present value of Re.1 received at the end of the eighth year is 0.467.

Question 8

Kishore chemical company is presently paying an outside firm Re.1 per gallon to dispose off the waste resulting from its manufacturing operations. At normal operating capacity, the waste is about 50,000 gallons per year.

After spending ₹ 60,000 on research, the company discovered that the waste could be sold for ₹ 10 per gallon if it was processed further. Additional processing would, however, require an investment of ₹ 6,00,000 in new equipment, which would have an estimated life of 10 years with no salvage value. Depreciation would be calculated by straight line method.

Except for the costs incurred in advertising ₹ 20,000 per year, no change in the present selling and administrative expenses is expected, if the new product is sold. The details of additional processing costs are as follows :

Variable : ₹ 5 per gallon of waste put into process.

Fixed : (excluding depreciation) : ₹ 30,000 per year.

In costing the new product, general administrative overheads will be allocated at the rate of 2 per gallon.

There will be no losses in processing, and it is assumed that the total waste processed in a given year will be sold in that very year. Estimates indicate that 40,000 gallons of the product could be sold each year.

The management when confronted w

ith the choice disposing off the waste or processing it further and selling it, seeks your advice. Which alternative would you recommended? Assume that the firm's cost of capital is 15% and it pays on an average 35% tax on its income.

COST OF CAPITAL II

CLASSWORK SECTION

Question 1

TT Ltd. issued 20,000, 10% convertible debenture of ₹100 each with a maturity period of 5 years. At maturity the debenture holders will have the option to convert debentures into equity shares of the company in ratio of 1:5 (5 shares for each debenture). The current market price of the equity share is ₹ 20 each and historically the growth rate of the share is 4% per annum. Assuming tax rate is 25%. Compute the cost of 10% convertible debenture using Approximation Method and Internal Rate of Return Method. [YTm]

PV Factor are as under:

Year	1	2	3	4	5
PV Factor @ 10%	0.909	0.826	0.751	0.683	0.621
PV Factor @ 15%	0.870	0.756	0.658	0.572	0.497

Question 2

Mr. Mehra had purchased share of Alpha Limited for ₹ 1,000. He received dividend for a period of five years at the rent of 10 percent. At the end of the fifth year, he sold the share of Alpha Limited for ₹1,128. You are required to compute the cost of equity as per realised yield approach.

DIVIDEND DECISIONS

CLASSWORK SECTION

Question 1

The earnings per share of a company are ₹ 8 and the rate of capitalisation applicable to the company is 10%. The company has before it an option of adopting a payout ratio of 25% or 50% or 75%. Using Walter's formula of dividend payout compute the market value of the company's share if the productivity of retained earnings is (i) 15% (ii) 10%, and (iii) 5%.

What inference can be drawn from the above exercise?

Question 2

A firm paid dividend at ₹ 2 per share last year. The estimated growth of the dividends from the company is estimated to be 5% p.a. Determine the estimated market price of the equity share if the estimated growth rate of dividends (i) rises to 8%, and (ii) falls to 3%. Also find out the present market price of the share, given that the required rate of return of the equity investors is 15.5%.

Question 3

RST Ltd. has a capital of ₹ 10,00,000 in equity shares of ₹ 100 each. The shares are currently quoted at par. The company proposes to declare a dividend of ₹ 10 per share at the end of the current financial year. The capitalization rate for the risk class of which the company belongs is 12%. What will be the market price of the share at the end of the year, if

(i) A dividend is not declared?

(ii) A dividend is declared?

(iii) Assuming that the company pays the dividend and has net profits of ₹ 5,00,000 and makes new investments of ₹ 10,00,000 during the period, how many new shares must be issued? Use the MM model.

(iv) Assume everything same in situation (iii), how many new shares must be issued it dividend is not paid.

Question 4

Rishab Ltd has just paid out ₹5 as Divdend to its Shareholders. The past dividend trend of the Company indicates that the dividend outgo increases by 10% p.a. The Company foresees this growth rate for the next 2 years, after which the divdend outgo will increase by 12% p.a. for 3 years and thereafter, 12.50% for 2 years. After that point in time it is expected that annual increase in dividend will be fixed at 11% p.a. If the expected rate of return is 17.50% p.a., ascertain the Theoretical Market Price of the Share, assuming Dividend Outgo is the sole determinant of the Market Value.